



Humanising policy from ‘Warriors to Guardians’: An evaluation of Coordinated Management and Emergency Response Assemblages in Ireland and the US.

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## **Declaration**

I declare that the work described in this dissertation is, except where otherwise stated, entirely my own work, and has not been submitted as an exercise for a degree at this or any other university. I further declare that this research has been carried out in full compliance with the ethical research requirements of Maynooth University.

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## Abstract

Coordinated Management and Emergency Response Assemblages (CMAERAs) are complex, multi-faceted, institutionalised networks of emergency response agencies, people, processes, technologies, histories, geographies and cultures which shape the strength of inter-agency coordination and emergency response. This thesis explores how a variety of actors, actants and technologies involved in emergency management assemble and organise. The methodology adopted is qualitative and uses two case studies to evaluate how CMAERA oscillate from their organised shape as dictated by policy to a new shape emanating from the needs of a response call. The case studies were: the Irish Emergency Management Assemblages (IEMA) response to the winter storms of 2015/2016 and the United States Emergency Management Assemblages (USEMA) response to the Boston Marathon Bombing in 2013. Fifty-one semi-structured interviews of key stakeholders and emergency response agents were conducted and supported by an interpretive analysis of key policy documents. By adopting assemblage theory and applying it to the empirical findings of the IEMA and USEMA, conceptualised within Foucauldian and Agambien understanding of power and sovereignty, this thesis offers a theoretical and philosophical framework to study emergency services, their interactions and power dynamics while keeping in sight their histories, cultures and current situations. This resulted in recognising that CMAERAs re-shape and oscillate position regularly to ensure that response is adequate and efficient. These movements are influenced both by the situation, inter-agency trust, and previous working relationships, but also from external factors, such as the institutionalisation and siloed manner of agencies, (in)formalisation, their relationship with the government, technological advancements, data analytics but also human nature. These broad factors affect inter-agency coordination and collaboration by creating barriers preventing the development of a true Coordinated Management and Emergency Response Assemblage. Finally, it provides three wider contributions to knowledge: expansion of the term ‘vulnerability’, development of embodied assemblages, and the identification of three urban factors which affect assemblage oscillation.

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AAR- After-Action Report	BFD- Boston Fire Department
AGS- An Garda Síochána	BOLO- Be on the Lookout 0
AI- artificial intelligence	BPD- Boston Police Department
AMPDS- Advanced Priority Medical Dispatch System 0	BRIC- Boston Regional Intelligence Centre
ANPR- Automatic Number Plate Reading 0	<b>C</b>
ARC- American Red Cross	CAD- Computer Aided Dispatch
	CCTV- Closed Circuit Television
	CDA- critical discourse analysis
<b>B</b>	CEM- Comprehensive Emergency Management
BAA- Boston Athletic Association	

CEMP- Comprehensive Emergency Management Plan  
CFC- Commonwealth Fusion Centre  
CICC- Centro Integrado de Comando e Controle  
CMAERA- Coordinated Management and Emergency Response Assemblage  
CMT- Crisis Management Team  
CoBNHMP- City of Boston Natural Hazards Mitigation Plan  
COO- Controller of Operations  
CRO- Centro das Operações do Rio

## D

DCC- Dublin City Council 0  
DCMNR- Department of Communications Marine and Natural Resources  
DEHLG- Department of Heritage and Local Government  
DFA- Department of Foreign Affairs and Trade  
DFB- Dublin Fire Brigade 0  
DFS- Massachusetts Department of Fire Services  
DHC- Department of Health and Children  
DHS- Department of Homeland Security  
DNC- Democratic National Convention]  
DoD- Department of Defence

DoHPLG- Department of Housing Planning and Local Government  
DRI- Digital Repository of Ireland 0

## E

EMS- Emergency Medical Services 0  
EOC- Emergency Operation Centre  
EOD- Explosive Ordnance Disposal  
EPREP- Emergency Preparedness Research Evaluation and Practice  
ERC- European Research Council  
ESF- Emergency Support Function  
EU- European Union

## F

FAA- Federal Aviation Administration  
FBI- Federal Bureau of Investigations  
FEMA- Federal Emergency Management Agency  
FIREScope- Firefighting Resources of Southern California Organized for Potential Emergencies  
FLAG- Flood Action Group

## G

GAO- Government Accountability Office 0  
GDPR- General Data Protection Regulation  
GIS- Geographic Information Systems  
GSAS- Garda Síochána Analysis Service 0  
GTF- Government Taskforce

## **H**

HHSCR- House Homeland Security  
Committee Report

HSE- Health Service Executive

## **I**

ICS- Incident Command System 0

IDWG- Inter-Departmental Working  
Group

IEDs- improvised explosive devices

IEMA- Irish Emergency Management  
Assemblage

IQDA- Irish Qualitative Research  
Archive 0

## **L**

LA- Local Authority

LECC- Law Enforcement  
Coordination Centre

LGD- lead government department

## **M**

MA- Massachusetts

MACC- Multi-Agency Coordination  
Centre

MA-CEMP- Massachusetts-  
Comprehensive Emergency  
Management Plan

MAESF- Massachusetts Emergency  
Support Function teams

MANG- Massachusetts National  
Guard

MassDOT- Massachusetts Department  
of Transport

MBTA- Massachusetts Bay Transport  
Agency

MDPH- Massachusetts Department of  
Public Health

MEMA- Massachusetts Emergency  
Management Agency

MEM-Major Emergency Management

MSP- Massachusetts State Police 0

## **N**

NAS- National Ambulance Service

NECC- National Emergency  
Coordination Centre

NECG- National Emergency  
Coordination Group

NGO- Non-Governmental  
Organisation

NIMS- National Incident Management  
System 0

NOAH- Neighbourhood of Affordable  
Housing

NRAI- National Risk Assessment for  
Ireland

NRF- National Response Framework

NRP- National Response Plan

NSG- National Steering Group

## **O**

OEM- Office of Emergency  
Management

OEMS- Office of Emergency Medical  
Services

OEP- Office of Emergency Planning

OPW- Office of Public Works



OTIS- Office of Technology and  
Information Services

SEOC- State Emergency Operations  
Centre

**P**

**T**

PD- Police Department 0  
PKEMRA- Post-Katrina Emergency  
Management Reform Act  
PPD- Presidential Policy Directive  
PRA- Principal Response Agency

TCD- Trinity College Dublin 0  
THIRA- Threat and Hazard  
Identification and Risk Assessment

**R**

**U**

REOC- Regional Emergency  
Operations Centre  
RIC- Royal Irish Constabulary  
RTC- road traffic collisions

UCC- Unified Command Centre  
UK- United Kingdom  
US- United States  
USA - United States of America  
USEMA-United States Emergency  
Management Agency

**S**

**V**

SCADA- Supervisory Control and  
Data Acquisition  
SEMNSF- Strategic Emergency  
Management National Structure and  
Framework

VR- virtual reality

**W**

WebEOC- Web Emergency  
Operations Centre

## Chapter 1: Introduction

*“Want of foresight, unwillingness to act when action would be simple and effective, lack of clear thinking, confusion of counsel until the emergency comes, until self-preservation strikes its jarring gong – these are the features which constitute the endless repetition of history.”*

Sir Winston Churchill (British Politician and former Prime Minister of Great Britain and Northern Ireland 1874-1965), speech, House of Commons, May 2, 1935.

### 1.1 Introduction

Geographers study hazards and their transformation into disasters as a bridge between the physical and human schools of thought. They examine the risks and social vulnerabilities that lead to devastating disasters but refrain from studying the effects of a weak or strong emergency management system. This raises the question as to whether emergency management efficiency or inefficiency contribute to the vulnerabilities of a space during a disaster? By only focusing on the socio-economic contributions to vulnerability production there is a lack of insight into how vulnerability is re-enforced within emergency management systems which directly affects the effectiveness of recovery processes. Therefore, this thesis takes the first step in the evolution of disaster geographies by recognising that there is an abundance of literature on risk and vulnerability but, in light of recent global changes, we need to start exploring the policy and response networks involved in disasters and possibly expand our definition of vulnerability. We need to begin asking questions regarding the plans that will protect us and the processes and decision-making efforts that develop and hinder response resulting in the creation of new vulnerabilities both during and after an event.

### 1.2 Emergency Management

Emergency Management is both theoretical and operational. The theory supports the tactical application of emergency management through prediction, mitigation and management, but the operational aspect also informs the future theory. The theory of emergency management endures continual change,

adaptation and development due to its rapid evolution to meet the needs of modern society.

However, the underlying principle of modern emergency management is the all-hazards approach. This approach is the leading structure used worldwide when designing and implementing emergency response protocol. This approach is deemed the most efficient way to deal with hazards as it encourages the view that many aspects of preparation and response such as, policy formation, training and activation, are similar regardless of the type of event (MEM, 2006; O’Riordan, 1992; Gregory, 2015; and Adini et al, 2012; Waugh, 2005; Marietta, 2012; Rogers, 2011 and Ayub et al, 2007). Of course, emergency response plans do differ from place to place depending upon the risks identified (Canton, 2013) but through the all-hazards approach most have a basic hierarchy of generic steps. It is these generic steps which allow for a quicker, better coordinated and a more effective response, as plans are tailored to provide general information regarding who should respond when and who has ultimate responsibility. As with any underlying structure, the all-hazards approach, has its advantages and disadvantages which affect how emergency management systems are shaped and coordinated.

#### 1.2.1 Advantages of the All Hazard Approach

The all hazard approach is cost effective with regard to money and time (Waugh, 2005 and Gregory, 2015). This is because the all-hazard approach inherently calls for a coordinated response from all response agencies and governing institutions. Thus, the all-hazard approach promotes the development of agency-specific plans contextualised within broader local, regional and national plans. These plans should incorporate all agencies and their resources to avoid wasting time and effort (Hammond, 2005). This allows agencies to understand their role and level of resources within their own agency, but also within the broader emergency response system and reduces the duplication of efforts.

The all-hazard approach promotes the development of a single response plan. This plan allows for the consolidation of resources and the combination of coordinated efforts across agencies supported by one institution, usually the government (Gregory, 2015). The all-hazards plan creates a system of response which, regardless of its inefficiencies, is needed when responding to an

event. There has to be plans even if they are not perfect, there needs to be a lead agency and all of that should be decided beforehand. This assures knowledge of who the lead agencies are, availability of resources and decisions regarding communication and incident command teams are all available before a crisis occurs. This reduces conflict and the use of technical jargon between agencies (Gregory, 2015). Finally, the all-hazard approach can work against the institutionalised and siloed nature of some agencies as it gives them time to prepare and train with other agencies and establish formal networks prior to an event.

### 1.2.2 Disadvantages of the All-Hazard Approach

Due to its all-encompassing nature, the all-hazard approach attempts to mitigate and manage disasters of different natures (Gregory, 2015) because they deem “the principles of disaster resilience to be [are] the same” (Godschalk, 2003:139) regardless of their categorisation as natural, technological, terrorist, biological, chemical, war, UFOs (as in space trash and asteroids not extra-terrestrials) etc. As a result, the all-hazard approach is quite simplistic and ignores contextual factors that shape events and the potential movement away from original policy in light of different events.

The response to this critique of the all-hazard approach is often that the procedures, staff, response mechanisms and resources after an event are the same or similar, but as Gregory (2015:1) points out “the same cannot be said of processes used to mitigate initial damages prior to events belonging to the different categories”. For example, natural events can be more widespread and incur more structural damage as well as high levels of fatalities while human-made events tend to be more localised with less structural damage, but often have high levels of fatalities too. Thus, they require different mitigation procedures (Fremont, 2004) that do not fit neatly within all-hazard based emergency plans.

In creating an all-hazards plan there is always the temptation that emergency planners choose the hazards most likely to affect their state (Waugh, 2005). This creates the inability for communities and states to respond effectively to rare events due to a lack of detail and instruction resulting in emergency plans becoming ambiguous and unclear (Gregory, 2015). This view supports the argument presented by McEntire (2004) that one single principle such as the all-hazards

approach may provide direction within the discipline and within practice but operationally, it may also become too broad and ambiguous to actually be effective (Gregory, 2015).

Drabek (1985) argues against the technocratic nature of emergency management which the all-hazards approach encourages and instead proposes a need to work with communities, voluntaries and other agencies who may have different forms of knowledge to that of emergency planners, government and the emergency services. This means that although the all-hazard approach ensures that emergency planners are prepared for a range of disasters, they often neglect to study or understand the role that broader factors such as weak governance and strong institutionalisation have in the creation of disasters and for the efficacy of response.

The all-hazard approach allows for better, quicker and more efficient responses to a range of disasters. This approach is not without its limitations, but it provides opportunities for increased coordination, knowledge sharing, the establishing of networks and relations and an understanding of each agency's role and relationship with one another during a crisis. It would be impossible to develop specific plans for every possible event; thus, this approach gives a community its best possible chance to mitigate the event, minimise damage and loss of life. However, emergency management as a discipline and practice is not as straightforward as illustrated above. Instead, there are three observations which need to be made in order to understand how the emergency management systems are shaped and operate.

Firstly, society relies on the emergency management systems in times of great need and yet, the restrictions which emergency response agencies operate under, are rarely acknowledged in any meaningful way. For instance, emergency response agencies are constantly fighting against their own and other agencies institutional cultures which affects inter-agency collaboration. Emergency response agencies also operate under restrictive power dynamics that often change and influence them in unpredictable ways based on a range of circumstances and they are often excluded from the development of national and local policy. This results in policy being written by policymakers with no operational experience often resulting in ineffective policy which does not meet the requirements or contradicts

emergency response processes. Therefore, the thesis explores the spaces and organisation of emergency management and how human-made and natural disasters are being planned for and tackled via policy, training, infrastructure and investment, within the context of a growth in new urban technologies and data analytics designed to improve the efficient response to any event. This is revealed through an examination of the intricate networks that sustain emergency management agencies in light of cultural, historical and power-driven factors which affect these emergency response agencies in terms of their growth and their ability or desire to collaborate with other response agencies.

Secondly, how can we make sense of managing emergency response? Emergency response is a collaborative process involving a range of agencies and institutions including first responders, voluntaries, government departments and communities. Thus, there is usually a policy in place which sets out clear pre-determined structures and hierarchies in an attempt to ensure response does not devolve into chaos when multiple response agencies, with different purposes, respond to the same event. However, there is evidence offered throughout this dissertation, which illustrates that emergency response, when overly structured becomes messy and uncontrolled. This can result in an increased risk of safety to those involved, the development of new vulnerabilities and a weakly coordinated response. On the other hand, when emergency response is overly informal and unstructured, decision making and responsibility become more complex, chaotic and difficult to attain. Therefore, this thesis proposes a need to examine the differences between formal and informal emergency management structures and the role of the middle ground between these structured and unstructured systems. These issues of (in)formality arise out of a conflict between policy-based response and activated response which results in a need to conceptualise the changing shapes of emergency management.

Thirdly, the discipline of emergency management only emerged in the 1970s (Marietta, 2012) and cannot be considered a discipline in the same way as Geography or Sociology. Instead, key thinkers in the field argue that the theoretical foundations of emergency management are limited with the discipline relying on multiple concepts such as risk, vulnerability, coordination etc. from a range of disciplines (McEntire, 2004 and Drabek, 2004). Due to this, Drabek (2004:4) argues

that there are different types of theory informing emergency management including “normative” theories, principles such as all-hazards, philosophical approaches such as social construction and the adoption of conceptual ideas such as social vulnerability. McEntire extends this argument by proposing that before the discipline of emergency management can develop its own set of theoretical frameworks, there are a number of conceptual barriers which must be overcome including the creation of accepted definitions for key terms such as ‘disaster’ and ‘hazard’.

Therefore, with regard to emergency management, its evolution and lineage actually provides more information (Chapters 4 and 5) than a comparison of different approaches because the emergency management discipline is immersed in other disciplines perspectives and histories. This void of meta-level theory is recognised within the discipline and there are attempts to work towards creating a more defined theoretical framework. However, presently, emergency management is still very much written for its practitioners with the key literature presenting more empirically based ideas. Thus, by recognising the need for theory to help conceptualise and situate emergency management as a discipline, this dissertation applies assemblage theory to reveal how emergency management systems are structured and operate.

### 1.3 Assemblage Theory - An Ontological Question

An assemblage is a way of understanding society by recognizing that various actors and elements are bound and work together to produce outcomes, but that an assemblage's constitution is not fixed, and different elements of the assemblage can be moved, replaced and exchanged (Castree et al, 2013). This presents society and its parts as fluid entities with unique forms of connections which ensure that infrastructures and agencies are organised in particular ways, usually in relation to the power dynamics involved within the assemblage. But why use assemblage theory and why apply it now to explore emergency management?

This theoretical framing is derived from a need to conceptualise emergency management systems as networks of agencies, institutions, jurisdictions, technologies, processes, policies, power dynamics, histories and geographies. However, assemblage theory, as it is currently discussed in the literature, is bounded and employed via specific ontological positions which attempt to explain how the

world is structured (see Table 1.1). Therefore, I study assemblage theory in line with Foucauldian and Agambien theories of power and governance in order to demonstrate the microcosms of power, the power dynamics of inter-agency coordination and to reveal the power regimes and sovereign authorities that allow these assemblages to work in the way they do. It is this framing that results in two of the key contributions of this work to wider knowledge.

Firstly, it illustrates that assemblages are fluid structures which change shape in response to outside stimuli such as power dynamics, cultures, goals, histories and geographies. However, to fully understand the oscillating nature of assemblages the research does not call on any of the stipulated ontological positions of assemblage theory. Instead, it argues for a middle-based ontology which offers a more contextual discussion of assemblages while, recognising that each ontological position has value. However, in the empirical sense, hierarchical and flat ontologies do not offer anything to our understanding of how emergency management assemblages are actually shaped via policy and re-shaped via activation. Therefore, I suggest that there is a need to limit the ontology question within the research in order to highlight that assemblages oscillate under different circumstances and cannot be fully understood via one ontological understanding. In doing so, I take a pragmatic approach proposing that assemblages oscillate between hierarchical (Labowitz, 2009; Barbour, 2012; Agamben 1991; 1998; 2003) and flat positions (McFarlane, 2011a/b) often occupying a middle position for a time. This raises questions regarding under what contexts (political, cultural, historical and geographical) do assemblages metamorphize in different ways?

Secondly, acknowledging that these ontologies exist and are legitimized and useful for understanding the world on a theoretical level paves the way for a sanitized and specific understanding of society and institutions based upon one's axiological and ontological beliefs. This results in very different readings of how society and institutions actually operate and are governed often presenting one perspective based on structure (as argued by theorists such as Marx, Harvey, Brenner and Agamben) and one based on fluid decentralised unstructured relationships (as argued by Foucault and Latour) (see Table 1.1).



However, by removing the ontological boundaries within assemblage theory and acknowledging that structures exist but are more fluid and oscillating than currently accepted by some authors, this research seeks to understand how assemblages actually operate and are governed. This is done by recognising governance more broadly and that the alignment of institutions and the notion of sovereign power is given away in liberal economies to governmentality. Yet, the consequences of this process on emergency management systems has not been as explicitly researched as it has been in other urban studies on housing, health and education. Thus, in an era of (perceived) increasing natural and human-made crises the effects of governmentality on the operation of emergency management assemblages is an interesting addition to assemblage theory and urban governance.

Table 1.1: Philosophical positions

<b>Ontological belief</b>	<b>Philosopher/theorist</b>	<b>Definition</b>
<b>Tendency to lean towards hierarchical structures</b>	Marxist (Marx, 1983)	Believes that the state is set up as a structure to defend private property. Power remains with the wealthy bourgeoisie who retain ultimate control so that the proletariat cannot obtain power in order to actively create structural change. It is a highly top-down society with little or no space for bottom-up change or power dispersion from wealth centres
<b>Moderate to mild hierarchy</b>	Agamben (1998; 2005; 2011) Harvey (2005; 2012) Brenner (2011)	Argue that assemblages are a bit more fluid and dispersed than Marx portrays. However, Agamben acknowledges that assemblages still retain a sovereign authority with ultimate control who can take over at any time, but the normal daily assemblage is built of a diverse number of agencies working together.
<b>Moderate to mild flat</b>	Foucault (1972; 1977; 1978; 1979; 1991)	Argues that assemblages are structured via discourses with no one puppet master or sovereign power. However, he argues that society and assemblages are far from unstructured. There are still clear dispositifs in how society

		shapes itself but that the power between them is more unstructured and movable. He demonstrates this through his observation of how prisons are run. There is a very clear hierarchy in a prison between the guards and the prisoners but even within those groups, there are more hierarchies. Thus, power is constantly moving and re-shaping so there is no one sovereign but multiple embodied sovereigns.
<b>Tendency to lean towards flatter structures</b>	Latour (1996; 2014)	Argues that dispositifs are far more loosely organised as there is no authority figure. Thus, power remains fully unstructured and moveable and that no one person or agency will or has full control over society or the assemblage.

Source: Author

#### 1.4 Aim of Study

The theoretical framework contributes to and shapes the purpose of this research in two ways. Firstly, its purpose is to explore how the structures and operations of emergency management systems are included, excluded and reactionary to changes in urban governance, particularly, in light of recent technological and data developments in urban spaces through smart city agendas.

There are an abundance of angles through which the influence of the ‘smart city’ agenda can be explored in the context of emergency services. This includes resource availability and efficiency, information of things, wearable technology and innovative technologies for search and rescue amongst others. However, the role of urban governance, inter-agency and inter-jurisdictional coordination and collaboration and the historical cultures of these agencies were cited, early in the research, as key factors facing emergency management as cities re-develop and modernise their technology use and data analytics. Thus, this research proposes that the "smart city" agenda is influencing another evolutionary node of urban governance with the use of algorithms, data analytics, artificial intelligence and machine learning to manage the urban. This, in turn, has the potential to change how emergency management systems and agencies respond to crises.

Secondly, the purpose of the theoretical framework is to re-think emergency management systems as assemblages which oscillate and change shape depending on the event they are responding too. This often results in emergency response differing from the established directions of policy. This argument contributes to a new agenda within assemblage theory which posits that assemblages, in reality, are not wholly flat or hierarchical but shift positions based on external factors such as trust, culture and inter-agency relationships. By conceptualizing these factors, this research proposes three new concepts; ‘splintering power’ which is derived from the work of Graham and Marvin (2001), ‘bouncing power’ and ‘imagined assemblages’. These emerged as a way of thinking about and supporting the hypothesis that assemblages are moveable and oscillating structures (see table 1.2).

Table 1.2: Empirical concepts

Concept	Definition
<b>Imagined assemblage</b>	Imagined assemblages form when responsibility and dominance are re-imagined as someone else's based on perceived power and hierarchy.
<b>Splintering Power</b>	The episodic nature of power creates networks that reposition assemblages and agencies from flat to middle to vertical as the power splinters between different people and agencies.
<b>Bouncing Power</b>	Coordinated Management and Emergency Response Assemblage (CMaERA) policy creates epicentres of power in the form of coordination and control centres, but as the power is decentralised across agencies and away from the epicentre it dissolves and re-emerges in local spaces with new regimes of power supported by local knowledge and informal networks.

Source: Author

Power splintering and bouncing refers to the division and sharing of responsibilities during an event, while imagined assemblages emanate,

irrespective of the policy, with regard to how people understand their power. Often, this imagined assemblage can be more important than the actual assemblage as it is a negotiated, symbolic and fabricated assemblage created due to particular positions of hierarchy rather than experience. Thus, those with experience often re-imagine their positioning in relation to those with more power but less expertise resulting in the creation of imagined assemblages.

Further, oscillation within an assemblage becomes particularly apparent when the nuances and intricate power networks of assemblages are analysed in terms of external urban and state factors and internal factors such as institutional tensions, the temporary/permanent dichotomy of policy, and the effects of urban governance. The broad aims outlined here are explored via an asymmetrical case study split between three locations and two events.

### 1.5 Scales of Study and Cases

This research uses an asymmetrical case study approach with the Irish Emergency Management Assemblage (IEMA) rather than a comparative approach. The primary case study is Dublin, which is supported by Cork and contextualised around the United States Emergency Management Assemblage (USEMA), specifically, Massachusetts. These assemblages are encompassed under the overarching conceptual term of CMaERA (Coordinated Management and Emergency Response Assemblage) as it envelopes several of the factors and concepts which shape these assemblages under one umbrella term.

A CMaERA, firstly, goes beyond first responders, to include all the relevant agencies of a city, including, but not limited to, Emergency Services, Local Authorities, Insurance Firms, Communities, Charities, the Defence Forces, Engineers, Civil Defence and the Government. Secondly, it acknowledges and explores the governance networks which influence the informal/formal dichotomy and institutionalisation of emergency management which affect the efficiency of inter-agency relationships deemed key for coordination. Thirdly, it requires a reflection on the geographical aspects of such a system and recognises emergency response as a local level initiative which acts within the context of regional and national response systems.

The concept of a CMaERA extends upon Calloway and Keen's (1996) understanding that Emergency Management Systems are "multi-disciplinary" in nature (adapted by Shen and Shaw, 2004; 2110). Therefore, to illuminate how they develop and work in practice it is imperative to explore them by cross-cutting different disciplines, in order to understand their geography, their innovative technology and organisational value. Kapucu (2012) explores this organisational value by inquiring into the inter-agency relationships that are created for the mutual benefit of agencies and communities at the local level through the lens of governance networks. Kapucu (2005) argues that these relationships allow for inter-agency networks to be adequately maintained in the face of major emergencies (Salaman, 2002; Kapucu, 2012). This results in benefits, such as increased collaboration, decentralisation and a better sharing of knowledge and resources between response agencies which in turn, positively impacts the affected area as the response is quicker and more efficient (Kapucu, 2005).

Further, CMaERA account for urban emergency management within technologically innovative spaces as they acknowledge the complex nature of emergency management in an era of increased technological solutionism and a culturally constructed risk society. A risk society forms when risk is perceived to be higher than it actually is due to increased media coverage, the ubiquitous nature of social media and political motives, amongst others (Gleeson, 2014 and Beck, 1992, 2009).

On a more focused scale, the use of CMaERA allows for an understanding of how the IEMA and USEMA are governed and organised. This is critical as governance is not just fractured by the institutional and legacy issues of the agencies but also by a misalignment between CMaERA and national or local policies such as smart city initiatives, data analytics and new implementations of urban technologies.

#### 1.5.1 Primary Case Study: Irish Emergency Management Assemblage

In Ireland, most emergency response agencies are national, such as An Garda Síochána (AGS) and the National Ambulance Service (NAS). Thus, the research could not be contained within one county or city and instead, it became a national evaluation, with focus placed on Dublin with Cork as a reference points.

Due to the national scale of the IEMA and the small number of people actually operating in that space, it is asserted that any findings from the Irish case study are representative of the entire IEMA and not just those based in Dublin and Cork. However, there are local inflections which cannot be adequately captured in this research.

### 1.5.2 Secondary Case Study: The United State Emergency Management Assemblage

The United States has more jurisdictional scales than Ireland: federal, regional, state, local, tribal and territorial, and there are also clear protocols as to when each scale should be activated. Thus, most police services are locally based, such as Boston Police Department and Cambridge Police Department, but then there are state police departments, such as Massachusetts State Police, and federal police, such as the Federal Bureau of Investigation. The Fire Service is normally city based only, while some cities have a public ambulance service, such as Boston Emergency Medical Services, others have a private ambulance service such as Quincy, Massachusetts. The findings from the US case study are not representative of the entire United States as a result of the complex structural differences between states.

### 1.5.3 Case Study Events

The two case study events are the 2015/2016 storms and floods across Ireland and the Boston Marathon Bombing of April 2013. This research is making a distinction between natural and human-made events for simplicity as the research is not interested in the process that led to these events, but how the relevant CMAERA responded and re-shaped during them in relation to pre-conceived policy.

### 1.5.4 Key Definitions

Finally, in this chapter, I have been casual with how I refer to post-hazard categorization as there are issues around semantics stemming from policy literature and colloquial uses. Thus, there are a range of concepts to describe the moment a hazard evolves into something which requires an immediate emergency response. These include 'emergency', 'crisis', 'disaster' and 'incident' but all signify a transgression from the norm. However, each has a particular definition and should not be used interchangeably for all situations. 'Crises' and 'disasters' are understood

as "catastrophic" occurrences (Castree et al, 2013: 109; Anderson, 2017; Blanchard, 2006) which are protracted and result in long-term consequences. They are also usually characterised by a high numbers of fatalities, structural damage and economic turmoil. An example is Hurricane Katrina.

‘Incident’ represents an episode in time where a situation occurs (Blanchard, 2006) and I assert that there is a sense that ‘incident’ is a less value-laden term than ‘emergency’ which primarily offers a sense of situational seriousness. However, the use of ‘incident’ does not actually qualify the seriousness of the event and is used to represent most events. Thus, both terms are used to represent the short-term everyday event while still being defined as situations which are “time-limited and linked to an immediate future” (Anderson, 2017: 464) rather than prolonged as with ‘crises’ and ‘disasters’.

This becomes confusing when studying emergency management policy and working with local first responders as ‘emergency’ is the predominant term used in Irish policy and ‘incident’ is the predominant term used in US policy. These are predetermined decisions to ensure that policy is connected, and terminology is the same across agencies and scales of governance, which is highlighted as essential for inter-agency knowledge sharing and response planning by the Major Emergency Management Team in Ireland (MEM, 2006). Further, complicating the choice of language is that both Irish and US emergency management policymakers still refer to other terms minimally while some participants used different language altogether representing that the distinctions are blurred and based on cultural understandings. However, by not explaining their choice of language and the use of concepts haphazardly, there is an omission of situational severity which is overcome by a more colloquial evolution of the re-naming of major events. For instance, in the US, major situations are referred to as incidents in policy, but when discussing potential terrorist situations, the language shifts between incident and attack while major terrorist attacks which have already occurred, are provided with their own descriptive name to illustrate the severity of the situation, i.e., ‘9/11’ or the ‘Boston Marathon Bombing’. In Ireland, situations are referred to as emergencies in policy, but major weather events are often named from the storm naming list of Met Éireann and the Met Office, or from colloquial plays on the situation such as the ‘Beast from the East’ and the ‘Son of the Beast’.

However, in policy and via media discussion they are referred to as ‘weather emergencies’ or ‘national emergencies’, etc.

Due to this linguistic confusion this research is imposing the standard term of ‘event’ to refer to broad examples and references. However, this is done with four caveats. Firstly, I am not using it as a noun but as an adjective to capture what is being done rather than what it is. Secondly, the choice to use ‘event’ does not attempt to undercut the scale or consequences or remove the descriptors which acknowledge the severity of the event. Thirdly, it is recognized that within a Deleuzian framing, ‘event’ is a slice of time where a coherent number of actions take place. This is appropriate in relation to the theoretical framing of this research. Thus, ‘event’ as a poststructural term provides a loose and broad way of referring to a multitude of situations with ranges of severity without becoming lost in the linguistic choices of such. Fourthly, the use of ‘event’ is only used in the broadest sense. When a situation has already occurred, the colloquial or global name and the assigned descriptor i.e incident or emergency etc. will be used. These choices have been made not to develop or evolve the existing categorisation of hazard response, but to remove the complex linguistic jargon which encapsulates this discipline, so the writing is focused on the problem, rather than overly value-laden linguistic choices.

## 1.6 Thesis Structure

The dissertation is divided into eight chapters. Chapter 2 begins with an introduction to the first major body of literature on the lineage of hazard studies and the use of the term ‘vulnerability’. The discussion then moves on to the organisation of emergency services as assemblages within hazard studies and proceeds to offer the theoretical framework for this research. Assemblage theory contextualised through a combined Foucauldian and Agambien perspective is the second major body of literature. These two works of literature are then cross cut by three other bodies of literature; urbanisation, neoliberalisation and smartification. These literatures offer context as to how assemblages, particularly CMaERA, are organised and may re-shape under different circumstances and at different times.

Chapter 3 outlines the research methodology and techniques that were used to generate the empirical data used in this study. A qualitative methodology was chosen because it provides a more in-depth analysis of the social



world (Brikci and Green, 2007), in this case, the organisation and operationality of a CMaERA in relation to urban practices. An asymmetrical case study approach was used with Dublin acting as the primary case study and Boston and Cork acting as contributory case studies to provide a broader and deeper understanding of Dublin and the IEMA. Interviews with key emergency response participants and city management teams across Ireland and Boston were the main method used to explore the city and event. To understand regional, state and national/federal policy an interpretive discourse analysis was undertaken on key policy pieces provided by participants.

Chapters 4 and 5 examine the policy organisation of the CMaERA and how they transform in shape during a major emergency, i.e. once the assemblage is activated. The policy sections are highly descriptive empirical chapters drawing off both desk and field research to portray the shape of the assemblages based on policy and protocol. Chapter 4 offers a detailed description of the Irish Emergency Management Assemblage (IEMA) using two key policy documents the Framework for Major Emergency Management and the Strategic Emergency Management National Structure and Framework Document. Chapter 5 offers a detailed description of the United States Emergency Management Assemblage (USEMA) from mainly federal documents such as the National Response Framework and state plans such as the Massachusetts Comprehensive Plan. However, this chapter also refers to several US interviews in order to clarify certain points due to difficulties in attaining enough relevant policy documents. Both chapters finish with an exploration of the two case events from the three case study locations. From Ireland, it explores the 2015/2016 winter storms and flooding and from Boston, it explores the Boston Marathon Bombing. These examples are used to illustrate that assemblages oscillate and to uncover the reasons and circumstances as to why they do.

Chapter 6 is interested in the broader external factors that affect the organisation and shaping of the IEMA and USEMA. It explores three key factors in detail: Political will and governance, institutionalisation and agency (in)formalisation drawing upon examples primarily from the IEMA due to the availability of individual agency knowledge, histories and policies. These, in turn, contribute to an understanding of how agencies work as silos and how this affects how they actually coordinate.

Chapter 7 questions whether the introduction of urban technologies and data analytics will change how CMAERA operate and are shaped. It deepens the discussion on institutionalisation by examining the benefits of smartification and whether technology is a solution or just a band-aid. However, emanating from the ERC funded ‘Programmable City Project, which aimed to “investigate the relationship between networked digital technologies and infrastructures and urban management and governance and city life” (The Programmable City, 2018), I examine the smartification of CMAERA. This is conducted by tracing the evolution of urban governance from one based on discipline to one governing via data. This is empirically studied through the IEMA by examining the role of algorithmic governance and illuminating disconnections between where the technology is and how these agencies are adopting and adapting to it. This is particularly interesting as the infiltration of big data into CMAERA may re-shape how they are organised and oscillate between policy and activation. This chapter primarily focuses on Dublin with Cork and Boston used to shed light on Dublin’s development and evolution of data driven processes.

The conclusions are presented in Chapter 8. This provides a synthesis of the case-study findings positing that assemblages do re-shape in response to different events. In addition, it examines the contribution of this project to key stakeholders and the wider field of Geography. It also provides a series of recommendations for emergency management officials.

## Chapter 2: Disruption: Re-shaping Assemblages, Interrupting 'Smartification' and Changing Urban Governance

### 2.1 Introduction

Globally, hazards escalating into disasters are a significant issue due to the increasing impact of humankind on the planet over the last two centuries. This has re-shaped natural environments to facilitate growing cities, towns, populations, industries and growing capitalist material expectations. White (1945:2) explains this through his simple assertion that “floods are acts of God, but flood losses are largely acts of man”(sic), meaning that the processes of flooding or any natural hazard are acts beyond humans, natural events, that we cannot stop. However, our choices in changing landscapes without due regard to natural processes, increase vulnerabilities and turn a hazard into a disaster. White’s perspective changed how we study hazards and their relationship with society determining that it is the combination of a hazard, a risk and a vulnerability which results in a disaster (MacDonald et al, 2011). This argument still influences how we predict, prepare for and mitigate against disasters today. An example is Lloyds City Risk Index in collaboration with the Centre for Risk Studies in Cambridge University (2018:2) who assert that the world is facing exponential growth in natural and human-made disasters due to three key reasons. Firstly, it highlights that by “2050 an estimated 66% of the global population will be urban residents” resulting in more risk due to more compact populations and infrastructure. Secondly, the top ten cities<sup>1</sup> at highest risk, all have sects of populations which face higher vulnerabilities due to socio-economic factors such as low income, education, health and language barriers. Thirdly, the top ten threats facing the globe between 2015 and 2025<sup>2</sup> range between natural disasters, such as flood and earthquakes, and human-made disasters, such as market crashes and inter-state conflicts. These are all expected to be more catastrophic due to the consequences of urbanisation and increased vulnerabilities.

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<sup>1</sup> Top ten cities at risk in order of highest to lowest risk: Tokyo, New York, Manila, Taipei, Istanbul, Osaka, Los Angeles, London, Shanghai and Baghdad.

<sup>2</sup> Top Ten Threats in order of highest to lowest: Market crash, interstate conflict, tropical windstorm, human pandemic, flood, civil conflict, cyber-attack, earthquake, commodity price shock and sovereign default.

This potential exponential growth in urban risk and vulnerability is the inspiration behind this research as it raises questions regarding the ability for Coordinated Management and Emergency Response Assemblages (CMAERAs) to adequately respond to these threats in a coordinated and efficient manner while minimising the creation of vulnerabilities post-event. To try and make sense of CMAERAs, assemblage theory in combination with a discussion on power, is pursued throughout this chapter. However, I refrain from discussing specific CMAERAs (Coordinated Management and Emergency Response Assemblages) in order to offer a broad overview of the theoretical frameworks and essential literature for this research. Therefore, this chapter has four distinct sections. Firstly, the positioning of this research within hazard studies is briefly evaluated followed by a broad discussion on assemblage theory, particularly its adoption within urban studies. This is a carefully curated section to offer the reader the key arguments needed for understanding how CMAERAs are shaped in future chapters. The role of power and sovereignty are also considered in this section as key catalysts in how assemblages are shaped and operate. This is followed by a succinct discussion on relevant facets of urban and neoliberal literature and a deeper conversation on processes of urban smartification. In particular, these cross-cutting themes of literature support the anchor literature of hazard studies and assemblage theory by exploring different modes of governance which contribute to the shaping and operation of urban assemblages through socio-economic, cultural, political and technological influences. This conversation includes an analysis of algorithmic governance which is substantially changing how assemblages and their entities are shaped and operate. The use of algorithmic governance is explored through two key examples; control rooms and ubiquitous technology. The chapter then concludes by discussing the idea that assemblages, especially CMAERAs, oscillate in numerous ways due to the dynamic interaction of their moving parts. Thus, it provides reasons as to why it is important to acknowledge that assemblages are fluid and are mobilised via their flexible networks.

## 2.2 Governing Hazards

Trying to predict and prepare for both natural and human disasters is a cornerstone of hazard studies with particular focus placed on White's assertion that "there is nothing natural about natural disasters" as they occur due to "Risk =

Exposure x Vulnerability” (Boyle, 2015: 270). This equation refers to the idea that risk is not created just because of a high rate of hazards in a particular location (exposure) but are also compounded by societal, cultural and political processes which increase the vulnerability of populations exposed to natural hazards (Boyle, 2015). This assertion was advanced within Geography by the work of Hewitt (1983;1997), Smith and Petley (1991) and Blaike et al, (1994) by arguing that the causes of vulnerability and risk need to be fully understood before more structural and deep-seated processes of mitigation can occur. This set-in play the primary approach for how to study hazard studies as geographers’ today.

However, there is more to hazard studies than just White’s assertion and his lineage as Smith and Petley (1991), Boyle (2015) and Castree et al, (2013) recognise four approaches which have helped to shape the discipline over the last century and are still active research avenues. For instance, prior to 1950, the engineering approach asserted, that it was the nature of nature which caused disasters and that the only fix was via “technological and engineering solutions” (Boyle, 2015: 271). Based on this, White’s early argument that disasters were more than just natural was an exceptional outlier but a clear advancement within the field during this time.

The engineering approach still exists in a morphed form, as solutions to natures wrath are still ‘solved/mitigated’ through engineering and technological processes as demonstrated during Hurricane Katrina. New Orleans approached hazard mitigation by building levees and re-zoning hazardous land for residential spaces, particularly for lower socio-economic classes. This engineering solution lulled and encouraged people to move into hazardous areas which were deemed ‘safe’. Thus, when Katrina hit, the levees failed! This engineering failure, combined with deeply entrenched socio-cultural inequalities and vulnerabilities, were the key contributing factors to the utterly devastating consequences. (Boyle, 2015; GAO, 2006). Further, post-Katrina, the pervasiveness of engineering solutions such as dredging, levees, seawalls and barriers etc are still associated with most mitigation processes today (Charlton, 2007; Castree et al, 2013).

The second approach emerged between 1950 and 1970 with a focus on urban hazards as cities began to grow and became more populous. In

response to this growth, city's began re-zoning land that was known to be hazardous such as floodplains, and hazard studies focused and still does on how to make these spaces safe. This was advanced during the 1980s when hazard studies began applying a political economic perspective which began to re-examine White's earlier assertions. The evaluation of vulnerability and its causes pushed the field into a new era of research with a focus " on how age class, race and gender were implicated with vulnerability" (Castree et al, 2013: 209).

The third approach is interested in the idea of a 'risk society'. The term was coined by Beck (1992) as a way of conceptualising an increased awareness around risks faced at the national, regional, local and individual scale. Beck (1992) argued that the increasing awareness around hazards and risk was due to four key developments. Firstly, the promotion of risks emanating from global hazards associated with climate change. Secondly, the fear that these events are only predictable in broad ways with local risks being harder to "approximate". Thirdly, risks were seen as so great that they were "uninsurable" and finally, "media" exposure "heightened" the scale of risk (Beck, 1992; Castree et al, 2013: 441). From this, a "sub-politics" (Beck, 1992; Castree et al, 2013:441) developed which critiqued state-led approaches to natural hazards and resulted in the emergence of an "environmental movement" (Castree et al, 2013: 441). At present, this environmental movement is helping to shape how we study hazards and disasters through politically motivated practices such as academic research, media portrayals and anarchist groupings as opposed to state-led methods.

The fourth approach, 'resiliency' emerged in the 1990s. Originally, within the natural sciences, resilience refers to how an ecosystem's stasis and equilibrium fares in the face of interference (Simmie & Martin, 2010 and MacKinnon & Driscoll Derickson, 2012) i.e. how does an ecosystem withstand and recover post-intrusion. The idea of having the structures in place to withstand and rebound quickly post a disaster attracted social scientists. Thus, resilience became an adopted term to explore how society can respond and recover from extraordinary events and shocks, such as 9/11(Gleeson, 2014 and Simmie & Martin, 2010). This approach argues that there is a need to recognise the inequalities of society, the markers of vulnerability and to then work towards decreasing these risks and creating more resilient communities. At its essence, it argues that these actions

should be done between disasters as resilience is "what we build between crises" (Rodin, 2013) and not about solving the last or future disasters. It recognises that as a society, preventing disasters is highly improbable but that the infrastructure and societal structure can be put in place before disaster strikes to limit the vulnerabilities and thus, consequences.

These approaches are well documented within a rich body of literature across Geography and multiple other disciplines. However, there is a notable gap with regards to the institutional and inter-agency dynamics of how hazards and disasters are planned for and responded to by emergency management services. Thus, this thesis argues that to fully understand hazards in society and their potential impact, we need to first contextualise the political, legal and cultural elements of the response and mitigation network as this directly affects how events form, germinate, (de)escalate, and endure. Therefore, the next section explains and evaluates assemblage theory and its applicability to CMaERA to examine how these networks are shaped.

### 2.3 What is Assemblage Theory?

Assemblage theory is an insightful theoretical framework for understanding how hazards are governed via networks of agencies, jurisdiction, scales, processes and policies. The origin of the concept 'assemblage' was first described in the book 'A Thousand Plateaus' (Deleuze and Guattari, 1980), as a bottom-up approach for understanding society in which individual parts can be moved, replaced and exchanged presenting ideas of fluidity and connection. However, these parts are not the focus of assemblage theory instead it prioritises the relationship, connections and differences between the separate parts. Deleuze and Guattari adopted the term 'assemblage' as a derivative of 'agencement', meaning 'arrangement'. Philosophically 'agencement' means that certain arrangements between agencies, concepts, processes and scales, result in particular meanings and connotations of what that structure is, its goals, its power and its priorities (Philips, 2006 and Buchanan, 2015).

Deleuze and Guattari (1987:406) unpacked the idea of 'agencement' by describing an assemblage as a "constellation" of different societal elements and powerful networks brought together within a formalised structure.

They argue that understanding the arrangement of the different entities should be contextualised in terms of their connections to fully reveal the meaning and role of that assemblage (Philips, 2006 and Buchanan, 2015). This is critical as the separate entities of the assemblage are “contingent” and “non-necessary” and can be moved around and replaced both within and between an assemblage (Castree et al, 2013, Legg, 2011, McFarlane, 2011a/b, Anderson and McFarlane, 2011, Brenner et al, 2011, Dewsbury, 2011, DeLanda, 2006). Thus, the aim of the assemblage regularly changes due to elements re-positioning to deal with different priorities. The movement and replacement of different elements within the assemblage are conceptualised in terms of territorialization, deterritorialization (when elements move out and/or are replaced/exchanged) and reterritorialization (when elements move in and/or are replaced/exchanged for others) (Deleuze and Guattari, 1987).

The concept of territorialization allows for multiple ontological frameworks to be used to frame assemblage theory. One intellectual tradition within assemblage theory suggests assemblages are vertical in structure and argues that there is a sovereign power that is ultimately providential in design, setting in place governmentalities to make people work in a predetermined way. In terms of territorialization and the coding of an assemblage (which Deleuze and Guattari present as how the assemblage is ordered) the hierarchical framework suggests that the actors and actants<sup>3</sup> are carefully positioned in relation to the sovereign and their scale of power, and that the deterritorialization and reterritorialization of the assemblage is ultimately controlled by the sovereign but with elements of providential will<sup>4</sup> for actors to internalize information and to self-organize when necessary.

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<sup>3</sup> The term ‘actant’ is related to Latour’s ‘Actor Network Theory’ (ANT) to describe non-human actors in a network or assemblage. Supporters of ANT often use it as replacement of ‘actor’ due to their perceived connotations with the term. I use ‘actant’ in combination with ‘actor’ to illustrate specific elements of assemblages and I support the idea that when an assemblage changes so do the ‘actants’ and ‘actors’. Therefore, I define ‘actant’ as the institutions, agencies, steering groups etc. which have set roles in the conception, evolution and activation of emergency management assemblages but are made up of both ‘actors’, technologies, processes and ideas. It is an all-encompassing term for describing the systems which allow the ‘actors’ to operate and oscillate.

<sup>4</sup> Providential will is a theological concept which refers to the idea of free will for people. Agamben (1998) uses it to describe how people began using their conscience to make choices as they internalised the will and expectations of God rather, than fearing his wrath on earth.



An alternative intellectual tradition within assemblage theory suggests that assemblages are flat in structure arguing that they are an anarchic chaotic assemblage of actors that are all vying against each other which then, somehow, become coherent to meet the needs of a task. Issues can be addressed more effectively and precisely because a flat structure is decentralized, rhizomatic,<sup>5</sup> adaptable and flexible. This allows for an understanding of how different elements are connected to each other and the consequences of such relationships. This framework undergoes regular deterritorialization and reterritorialization ensuring that the assemblage is coded in an efficient manner for each task. It is less bounded than the vertical position and relies more on the fluid nature of assemblages.

Due to these two foremost ontological positions, assemblage theory is highly debated and heavily critiqued across disciplines, for example, Haggerty and Ericson (2003) explore state surveillance while Patil and Purkayastha (2017) discuss India's culture of rape through the lens of assemblage theory. Similarly, within Geography, its application has been wide with scholars using it to explore state power (Allen and Cochrane, 2010), Foucault's apparatus (Li, 2007 and Legg, 2011) and the ontological shift of Human Geography (Dewsbury, 2011).

### 2.3.1 Assemblage Theory and Urban Studies

Thinking in terms of assemblage theory has become a growing research perspective over the last fifteen years, particularly in Geography and Urban Studies. Its popularity is due to its effectiveness as a theoretical framework for revealing and unravelling the complex networks of cities by "emphasising the relations between sociality and spatiality of different scales" (Kamalipour and Peimani, 2015: 402). It is able to be used in this way because of three reasons. Firstly, its Deleuzian origins allow for a multitude of ontologies to be used which supports research with different philosophical assumptions. Secondly, it focuses on how the urban is continually produced and re-shaped under different circumstances (Kamalipour and Peimani, 2015). Thirdly, it promotes thinking in a multi-scalar way. It is essential to study different urban scales to reveal their influences on and roles within assemblages. By understanding how each scale operates, any scalar mis-

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<sup>5</sup> The use of 'rhizomatic' is done so in line with Deleuze and Guattari's philosophical use of it in their 'Capital and Schizophrenia Project' between 1978 and 1980. They use it to describe multiple entries and exit points within research which they deem as non-structured.

alignments or repetitive work and significant differences in procedure and processes can be identified and interventions put in place (Kamalipour and Peimani, 2015).

Even so, within Critical Urban Studies, assemblage theory is highly contested as evident from the debate between Brenner et al, (2011) and McFarlane (2011a/b) in 'Cities'. This debate illuminated the differing and contested ontological approaches of the theory and how they influence our understanding of urban spaces, networks and institutions. McFarlane used assemblage theory as a conceptual framework to observe the relationships between actors and actants as a processual and emergent mechanism emanating from historical processes and the consequences of capitalism (Kamalipour and Peimani, 2015). This assertion that urban relations and networks are continually transitioning and changing under numerous influences, such as decentralized power networks, situates McFarlane's ontological position as structurally flat. However, his use of assemblage theory is to "deepen" rather than "limit" our thinking and application of critical urbanism and to avoid critiquing the many accepted and more hierarchical assumptions and theories of Urban Studies such as "urban political economy, capital accumulation and inequality".

Brenner et al, (2011) approaches assemblage theory through a political economic perspective arguing that it is more of a methodological process than an ontological process or theoretical framework (Kamalipour and Peimani, 2015). To defend this assertion, Brenner et al, (2011) offer five critiques of McFarlane. Firstly, assemblages are hierarchical and cannot be removed from the contextualizing and state-led factors that shape them such as history, geography, social vulnerabilities and the processes of capital accumulation.

Secondly, McFarlane observes the city as multiple relations, but Brenner et al, (2011:230) argue that this "displaces or supersedes the intellectual project of urban political economy" (McFarlane, 2011b; 376). Thirdly, Brenner et al, (2011) argue that McFarlane's work on urban assemblages does not extend the urban question but rather presents it as an alternative ontological method for studying the city (Dewsbury, 2011 and Farías, 2010) which does not adequately represent current urban systems and their assemblages. Fourthly, McFarlane (2011b:376) argues that assemblage theory is an "all-or-nothing urban theory that actively displaces the

critical traditions of the past in favour of a renewing of urban theory in general". Brenner et al, (2011) argue that this places urban theory in a subordinated position or subsumes urban theory into assemblage thinking rather than acknowledging that assemblages develop as part of the urban through antecedent processes, policies and city goals. Fifthly, Brenner et al, (2011) critique McFarlane's approach by arguing that a wholly flat approach to urban assemblages ignores structures such as "sociospatial, political-economic and institutional contexts" (p.233) and power relations in which urban spaces are developed and maintained.

McFarlane (2011b:381) refutes this by articulating that "assemblages are structured" and suggests that using assemblage theory does not remove these structures from the conversation or ignore the fact that at certain times within separate assemblages, different agencies are more prominent. Instead, he argues that assemblage theory does not decide beforehand who the most important actors are. This relates back to Deleuze and Guattaris idea of territorialization and coding. The use of these concepts is to ensure that the correct ordering of actors and actants are in place for different tasks by understanding the history, geography, societal, cultural and economic contexts that the assemblage operates within. However, with the ability for deterritorialization and reterritorialization, McFarlane makes a valid argument that actors and actants can shift quickly when required, thus it is not always necessary to have decided who the important actors and actants are beforehand.

To make sense of these different perspectives of urban assemblages, Brenner et al, (2011:231) provides a synthetic typology to illustrate different analytical approaches for urban assemblages. I have adapted that table into bullet points to pinpoint the key characteristics of each level.

- Level one is described as "empirical" where an assemblage is a single entity which can be studied within a "political-economic framework" and understood in relation to its geographies and histories. This converges with the beliefs of Brenner et al, (2011)
- Level two recognizes a messy middle ground described as "methodological" and sees the use of assemblages as a way of extending our understanding of the "urban political economy".

- Level three is described as "ontological" and understands assemblages as a different way to study and understand the city. This converges with the work of McFarlane (2011a/b).

I contend that there is a need for a closer analysis of assemblages at level two that encompass characteristics of both level one and three. This assertion is supported by the work and critiques presented by Scott and Storper (2015), Dovey et al, (2017) and Kamalipour and Peimani (2015) who argue that assemblage theory is a jargoned term which lacks agency and power. Further, they re-iterate McFarlane and Andersons (2011) argument that actor-network theory and assemblage theory should be infused in a more nuanced way within geographical studies because it is used by geographers as a way of understanding space. However, others assert that understanding the urban scale requires assemblage thinking to be more hierarchical. This ontology is seen in Allen and Cochranes (2007, 2010) work on regions and state power, while Legg (2009) promotes the need for a conversation on scale and assemblage theory.

However, more interesting are the authors who refer back to the original Deleuzian and Guattarian conceptualization and begin to resist taking an ontological stance and instead are applying the theory in a very grounded way. This results in innovative arguments around a messy middle suggesting that assemblage theory can be used to position ideas and concepts which are not wholly flat or hierarchical. For instance, Allen and Cochrane (2010) research state power framed around a hierarchical ontological perspective but they recognize that this is complicated by the decentralization of state power at the local scale which is structurally flatter. Dovey et al, (2017) argues that assemblage theory and agglomeration theory are complementary as they encourage understanding the city in multiples rather than as one entity.

Based on these key arguments of assemblage theory, this thesis builds upon the idea that urban assemblages are messy and nuanced and cannot wholly be understood through an ontological commitment of either verticality or flatness. Thus, I push the ideas of Allen and Cochrane, Dovey et al, (2017) and Brenner et al, (2011) further by suggesting that, assemblage entities can be situated in the middle, but that it is not a resting and defined position. Instead, assemblages

actually oscillate between the hierarchical and flat positions, sometimes occupying the middle not just ontologically, but because of political and societal influences. I recognise that there are multiple ontologies which are appropriate for studying the urban and its infrastructures but that these all produce particularly framed findings and observations. Thus, I am refraining from positioning this research within just one ontology and instead, I am going to apply assemblage theory in a post-ontological manner. By post-ontological, I am not referring to the idea of ignoring the accepted ontological positions within assemblage theory, but I am arguing for the ontological position to be determined by empirics rather than theory. I propose this as assemblages are embodied and can never wholly be removed from reality. They are not just theoretical imaginaries but actual live, fluid and flexible arrangements which, under certain circumstances, oscillate between hierarchical and flat shapes while also often occupying a middle position. However, to understand how these assemblages are organised and can oscillate in formation, discussing the role of power and sovereignty in cities is imperative.

#### 2.4 Power and Sovereignty

Power is a critically important conceptual tool that can be used to highlight the organisation of urban assemblages, but it is interwoven with sovereignty which is a long-contested but accepted act of power and authority over a given space/territory (Agnew, 2005). This assertion is supported by the work of Stuart Elden, who raises conceptual issues in how we understand these terms (2009;2013;2014). Elden presents territory as both an ideological concept and active state practice. However, he argues that if sovereignty is traced not to the Westphalian system of nation-states, but to classical thought, as evident through his engagement with Foucault and Lefebvre, then the relationship between territory and sovereignty should be understood as a political technology of power (Elden, 2014) with territory providing the “spatial extent of sovereignty” (Elden, 2009: 232). However, this creates the assumption that sovereignty is restricted to the boundaries of “territory” (Elden, 2009:173) which during political turmoil and war is not necessarily true. The relationship between territory and sovereignty is problematic because to save sovereignty often territory is violated, and to save territory often sovereign powers are damaged. Providing this brief overview of the complex relationship between territory and sovereignty is required before assemblages can be adequately analysed.

As it is critical to understand the microcosms of power, the power relations between agencies and in agencies, and the more overt power regimes or sovereign authorities that allow these assemblages to work in the way they do.

Understanding these power dynamics within social institutions and their arrangements between different agencies, groups, genders, wealth and health is a key theme in Foucault's work. Foucault described the effects of power through innovative conceptual tools, such as biopower, pastoral power, panopticon and governmentalities to understand sex, mental health, state institutions, body, discipline, free will and subjugation. However, critically he traced the history of power arguing that due to the shift from monarchy towards democracy, the model of power changed from a "sovereign or juridical form to a disciplinary one" (Andrejevic, 2008:608, Clarke, 2007 and Barou and Periot, 1976).

A disciplinary form of power takes "minimum investment and maximum return" (Clarke, 2007:6) and no longer operates at a territorial level (Sennellart et al, 2007), but instead is related to the nexus of nature and humans and where they collide (Gordon, 1980). Thus, it operates within society rather than outside or above it (Brochier, 1977 and Dean, 2012). Foucault argues that this shift requires a changing definition of sovereignty and a move away from close up power and domination to discipline and control from a distance. However, Clarke (2007) and Agamben (1991; 1998; 2003) argue that both forms of power (sovereign and disciplinary) are "integral and interrelated components of the general mechanism of power in modern society" (Clarke, 2007:6) and by discussing the eradication of sovereign power and "top-down strategies of control" (Andrejevic, 2008: 609), Foucault does not suggest that power is no longer operationalised at the highest level of society but rather operationalised through "micro-relations of power" (Foucault, 1972; 199 and cited in Andrejevic, 2008: 609). These micro-powers are part of the web-like system of assemblages which are made up of a number of institutions without there being a clear hierarchical focus (Editors of the Journal of Hérodote, 1977:71).

Yet, simultaneously, the state retains control over many of the institutions of the assemblage while remaining out of sight in the management of these until they begin to rally against the discourse and truths which the government

proclaims. Thus, Foucault argues that sovereign power brings with it acts of coercion and enforced rules, resulting in power being more scattered, dispersed and pervasive. Therefore, it cannot be enforced by one individual or separate groups. Instead, “power is everywhere” and “comes from everywhere” (Foucault 1998: 63) and it should not be understood as a thing but seen more as a relation that is productive and dispersed throughout society (Foucault, 1972; O'Farrell, 2007; Clarke, 2007). A theory of power would suggest that power must emanate or move from one point and concentrate in another but Foucault, as illustrated by Grosrichard et al, (1980:198/199), says that "in reality power means relations, a more-or-less organised, hierarchical, co-ordinated cluster of relations" and this is the site at which political power operates (Bal Sokhi, 2014).

Thus, Foucault adopts Clausewitz's idea that power is politics continued by other means and in addition argues that “power is war continued by other means” (Foucault, 1982:222: Clarke, 2007). This statement illuminates “that the role of political power . . . is perpetually to re-inscribe this relation through a form of unspoken warfare; to re-inscribe it in social institutions, in economic inequalities, in language, in the bodies themselves of each and every one of us” (Gordon, 1980:90 and Clarke, 2007:3). Thus, Foucault imagines society as web-like in which power is directed by the elite but in a messy manner and used to establish and "maintain the status quo" (Clarke, 2007:2 and Grosrichard et al, 1980). Thus, we see power move in many directions, in complicated forms of different strengths. It is these movements or power relations that create and maintain ‘social institutions’, ‘economic inequalities’, ‘language’ and even the ‘body’ as discussed by Foucault and illustrated in Gordon, (1980) and Clarke, (2007).

This idea can be applied to urban assemblages by understanding that the different agencies within the assemblage are maintained by networks of power that emanate from a sovereign authority but are also dispersed through the agencies themselves when they choose to follow the formal structure or engage in a more informal organisation. This becomes particularly important when exploring how changing techniques of governance affect how power is dispersed as it will influence how the assemblage organises and re-shapes. Foucault discusses specific ways in which the state operationalizes control and power. For example, pastoral

power and via panopticons but two critical ways are biopower and governmentality. These are particularly important when understanding how assemblages operate.

Biopower refers to the management of populations or the art of power (Foucault, 1979, O'Farrell, 2007 and Utopia or Bust, 2012, Gordon, 1980). It is a political strategy for governing both people and phenomena that affect the population, such as terrorism, flood events and protests (Bal Sokhi, 2014). Foucault suggests that biopower is the opposite of normally accepted modes of power as it is a positive form that attempts to protect life as opposed to being a repressive tool wielded by the powerful and oppressing the weak. If one was to understand power as only repressive and oppressive, then the state apparatus would mean that "the Army [i]s a power of death, police and justice as punitive instances, etc." (Fontana and Pasquino, 1976: 122).

However, this investment in the protection of life of the population means that when life is on the line then the state can produce its own discourse of truth and knowledge and justify its actions. One memorable example is the search for weapons of mass destruction. The strength of biopower and how it is used to manage populations is related to how society is governed and the power that the government has to manage the population in terms of governmentality. This encourages the "governing of the self" towards "the governing of others" (Lemke, 2000) and stems from the same idea as biopower rather than being a distinct idea.

A literal definition of governmentality is that 'govern' refers to the process of governing and 'mentality' refers to the thinking of a government and the ideas they wish to instil in the population (Bal Sokhi, 2014 and Lemke, 2000). Thus, governmentality can be understood as a thought process and a practice of governing and can be characterised as a web-like, complex form of power (Bal Sokhi, 2014; Sennellart, 2007) that acts upon certain parts of the population in different ways through an assemblage of institutions and through practices of policy, reflection and discourse (Sennellart, 2007:108).

Foucault uses governmentality to explore how the individual acts with self-control within the context of "political rule and economic exploitation" (Lemke, 2000 and O'Farrell, 2007) and argues that governing is different to sovereign power as it is about balance between processes of "coercion" and spaces



for the “self” to be “constructed”. Conversely, sovereign power is the ultimate power which forces people to do what the “governor wants” (Lemke, 2000). In this use, the government no longer refers to power over a territory but an amalgamation of people and phenomena (Senellart et al, 2007). Thus, governmentality is the ‘art’ and how of governing (Foucault, 1991 and Gordon, 1991) as it directs its subjects on how to behave, encourages self-discipline and homogenisation. By accepting Foucault’s understanding of power as an unstable, flexible and a fluid mechanism governed by numerous empowered ‘sovereign’ authorities who influence providential will and self-discipline via the coercion of societal acceptance, we need to ask, what does this mean for assemblage theory and how we contextualize it around functioning assemblages?

## 2.5 Contextualizing Assemblages

There are many philosophical approaches which could be used to answer this question but the two that are most applicable and deal with the idea of power at their core are Foucault’s ‘dispositif’ and Agamben’s ‘oikonomia’. Applying these two approaches to assemblage theory allows for reflection on both ontologies with ‘dispositif’ accounting for the flat post-structuralist ideals and ‘oikonomia’ accounting for a more hierarchical and sovereign-led formation. By bringing these into conversation with one another and applying it to urban assemblages, it is possible to begin to pull apart the different networks of power.

‘Dispositif’ is an aspect of governmentality which Foucault uses to conceptualise how power is exercised through various institutions influencing wider society. As power is distributed and networked, Foucault argues that there is no one sovereign power but multiples. Therefore, society no longer requires a sovereign leader to enforce control and discipline on a wider scale. Instead, we can ‘cut the kings head off’ (Gordon, 1972, Sennellart et al, 2007, Rider, 1999 and Dean, 2012a) and create a new ‘art of governing’. When applied to assemblage theory, this argument supports the formation of flat assemblages in which power is networked.

Radical flat ontologists further this argument by saying that it is mundane to think that the state or powerful agencies can control any part of the assemblage because they are random developments that are hybridized, complex amalgamations of different ideas with no top-down determination (Dovey et al,

2017). Therefore, assemblages contain no sovereign power and have limited, if any, broader state influence

Alternatively, Agamben is interested in sovereign power and its visibility demonstrating this through his work on camps and spaces of exception (Agamben, 2005, Bussolini, 2010 and Virtanen, 2003) where he suggests that state's infer their power through their ability to corral people and determine their fate in concentration and refugee camps. This is the highest demonstration of sovereign power and ruling from a distance.

This is particularly interesting because his work complements Foucault's, especially throughout his *Homo Sacer* project. For instance, the first *Homo Sacer* book primarily explored sovereign power (Agamben, 1998, Dean, 2012a and Bussolini, 2010) but his later books especially 'Kingdom and Glory' (Agamben, 2011, Dean 2012a and Bussolini, 2010), delve deeper into the relationship between sovereign power, biopower and governmentality.

Although Agamben's work complements and furthers Foucault's work, he does critique Foucault arguing that the division between sovereign power, biopower and governmentality did not occur in the 16th or 17th century but during early Christianity (Gordon, 1972, Dean 2012a, Sokhi, 2014 and Lemke, 2000). He implores the importance of the holy trinity in understanding this division and thus, goes back to Trinitarian and Augustine theology to suggest that it is during these times, those notions of sovereign power and governmentality were first developed (Agamben, 2011 and Bussolini, 2010).

The transformation in sovereign power during these theological periods occurred as the governance of people by God fundamentally changed. Initially, God was deemed a sovereign and absolute leader who had the power to destroy the earth if his word and guidance was not followed. Fears of a plague of locusts or a great flood enforced the idea that God had the ultimate power and used it to govern the earth. However, from Augustine onwards, the role of God and the teachers of theology transformed how God's governance and sovereignty was perceived. Instead, of following the word of God, uncritically, people were now encouraged to use their conscience to make decisions (Bussolini, 2010 and Dean 2012a) entrusting the governance of society to humans who had to internalise what

they thought God wanted. So, God moved from governing up close to governing from a distance.

This is not detached from Foucault's argument that the state (in Agamben's case God) places structures that make people self-discipline (Gordon, 1972, Sennellart et al, 2007, Dean, 2012a and Andrejevic, 2008). Thus, by following Agamben's lineage, the origins of governmentality and biopower are much deeper into history and more pervasive. This lineage means that Foucault's formulae of 'let's cut the Kings head off', is incorrect (dispersed sovereign power). Instead, Agamben suggests that sovereignty and governance from a distance results in the King ruling but he does not govern (Dean, 2012a). The King remains behind the scenes and he rules by dispersing his power to his subjects to manage everyday occurrences. He uses the term 'oikonomia', a theological concept to describe this. Further, 'oikonomia' is an interesting concept to apply to assemblage theory as it helps to explain why there is a messy middle ground between flat and vertical positioning for assemblages as the world is no longer governed wholly by a sovereign power but governed through third parties in order to create the outcomes the state wants from a distance rather than up close by creating subjects (Bussolini, 2010 and Dean, 2012b).

Although 'dispositif' captures the gap between vertical and flat (O'Farrell, 2007) it does not accept that there is any sovereign power shaping the assemblage and instead it argues that power is rhizomatic or undistributed and without leadership (Gordon, 1972 and Sennellart et al, 2007). Whereas Agamben's notion of 'oikonomia' is more vertical and hierarchical and it recognises the hegemonic power that is at the head of an assemblage. It accepts that assemblages have a human component, with natural instincts to push boundaries resulting in subjects not internalising providential will but instead following their own paths. However, that does not remove the ultimate sovereign who can discipline us (Dean, 2012a/b); sovereign power is always there (Bussolini, 2010). God tries to rule the world by not interceding directly but by having subjects disciplining their own behaviour by sending the Bible down to determine how we are meant to live and condition us to adhere to whatever the Bible suggests is the right way to live. So, God does not have to send a plague of locusts because we are all internalising the

values set out in the Bible and doing what God wants. Today, we internalise what the state and society want.

### 2.5.1 Urban Governance

Both ‘dispositif’ and ‘oikonomia’ are philosophical frameworks which help to contextualize assemblages and pull apart the different influences which determine how assemblages may oscillate. However, to fully understand how different factors shape assemblages we need to look at the spaces in which they operate, how these spaces are governed and how this impacts the shape of assemblages.

Changing modes of urban governance are well documented, ranging in research from the impact of the welfare state and its dismantling, towards a more neoliberal focused form of urban entrepreneurialism (Harvey, 1989; Kelly, 2008). To deploy Harvey’s phrase, the urban managerial approach was preoccupied with simply managing the city through providing a provision of services and facilities (Harvey, 1989). While urban entrepreneurialism refers to the processes that were undertaken in cities to regenerate deindustrialised spaces<sup>6</sup> in order to attract foreign investment through more “business-like approaches” (Kelly, 2008:36, Harvey, 1989; Maclaren & McGuirk, 2001; Punch, 2005 and O’Callaghan & Linehan, 2007).

Urban entrepreneurialism came about after cities, which had become reliant on manufacturing and other industrial sectors, began to feel the effects of deindustrialisation and the shift from a Fordist to a Post-Fordist regime (Harvey, 1989, Kelly, 2008). Post-Fordism is characterised by its flexible specialisation and was facilitated through globalisation, as it resulted in an easier flow of money and people across borders, making transactions and hiring much quicker. At the same time, technological advancements improved communications between different places (Byrne, 2001). This resulted in an increased spread of multinational corporations (MNCs) situating different parts of their companies in numerous locations worldwide. Thus, deindustrialisation and globalisation resulted

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<sup>6</sup> Deindustrialisation was caused by an increase in technological processes and the decline in urban managerial techniques of public services and citizen welfare towards privatisation amongst a medley of other issues.

in an urban crisis and the shift from urban managerialism towards urban entrepreneurialism occurred as cities responded to the urban crisis (Harvey, 1989 and Moore, 2002). In order for cities to remain competitive, they revamped their image as a method to encourage investment within their urban space (Moore, 2002; Hogan, 2006, O'Callaghan & Linehan, 2007 and Lawton & Punch, 2014).

At the same time as the urban crisis, the 1970s saw a fiscal crisis occur across the US and the UK resulting in a shift from welfarism towards neoliberalism (Harvey, 2005). Thus, the shift in urban governance was a manifestation of urban neoliberalism, which influenced how urban areas were redeveloped. In theory, the neoliberal state should encourage free markets and free trade (Harvey, 2005; Peck, 2010;2013; England & Ward, 2007) facilitated through the privatisation of public services and deregulation. However, neoliberalism never operates in “pure” form (Harvey, 2005; Peck, 2005). So, rather than the state staying out of the market, it intervenes in different ways in what Brenner & Theodore (2002) call “actually existing neoliberalism”.

The re-branding and marketing of cities, the focus on foreign investment and capital attraction changed state relationships with both public services and citizens. Meanwhile, the reduction in the welfare state and public service protections to foster privatisation and innovative but neoliberal modes of urban governance resulted in new dynamics between state departments and public services. The impact of urban entrepreneurialism and urban neoliberalism on public services was reduced resources, increased competition, target driven quotas, deregulation, and decentralisation coupled with increasing bureaucracy. These factors created inter-agency tensions, contributed to already siloed institutions, re-positioned priorities to meet certain targets without providing adequate resources or funding, and created disconnected policy resulting in fluid assemblages which are one shape in policy but wholly different when activated.

Combining the arguments presented by Foucault regarding fluid and networked power and Agamben's assertion that there is one key sovereign, in relation to, the effects of urban governance on assemblages, portrays issues with current approaches to assemblage theory when only understood via one ontological position. As such, ontologically the segregated uses of assemblage theory exclude a

whole space of messy power dynamics, inter-agency and inter-scalar relationships and overlooks the fluid borderless characteristics of active urban assemblages. Therefore, I argue for a more holistic approach when using assemblage theory, acknowledging that assemblages do not only fit neatly within a vertical or a flat ontological position but instead oscillate based on the needs of the assemblage.

### 2.5.2 The Disruptive Smart City

The shape of urban assemblages are further disrupted and changed as new forms of city management and governance are invoked. For instance, the development of the smart city rhetoric has resulted in significant changes to urban governance. These changes include the use of real-time information, control rooms, data analytics and CCTV amongst a range of other technologies (Kitchin et al, 2017). This is evident in cities which are increasingly being fitted with technological solutions and monitoring systems that increasingly act in "automated, automatic and autonomous" ways (Kitchin and Dodge, 2011) in a race to become "smart".

The smart city imaginary emerged out of the grid planning approach of the "high modernist era" (Kitchin, 2014a:2 and Greenfield, 2013) of the 1970s and was influenced by urban cybernetics (Kitchin; 2014a; Townsend, 2013 and Komninos, 2002). But in particular, the smart city is rooted in the shift from urban managerialism to urban entrepreneurialism (Harvey, 1989) and the relationship between new urbanism and the intelligent city (Kitchin, 2014a; Söderström et al, 2014; Hollands, 2008; Vanolo, 2013).

Shelton et al, (2015) adapts Brenner and Theodore's (2002) notion of actually existing neoliberalism and use it to highlight the actual policy implications and effects of smart city implementation as an alternative to literature which focuses on extraordinary examples, such as Songdo (a smart city development in South Korea). They explore the subtle and ubiquitous impacts that these policies have on cities, especially with regard to how data is used within the city and they emphasise a move away from neoliberal practices towards the role of data and the community. Shelton et al, (2015:22) suggest that data can be inclusive rather than "uncritical, ahistorical, and aspatial, which are often the understandings promoted within smart city imaginaries". However, they also highlight how certain smart city implementations have failed to be socially inclusive and instead they illuminate the

relationship between the smart city and entrepreneurialism (Shelton et al, 2016). This supports the view of Monfaredzadeh and Beradi (2015) who propose that effective urban governance can really only promote one stream of policy and yet, most smart cities have multiple goals such as economic growth but also the creation of social cohesion, resilience, liveable and safe cities.

Thus, one manifestation of the smart city is that it is "the corporate vision of smartness, in conjunction with an entrepreneurial form of urban governance" (Hollands, 2014; Harvey, 1989). This idea combined with neoliberal austerity has been used to promote the need for smarter technological solutions funded by corporations to solve urban issues (Pollio, 2016). However, the corporatisation of the smart city has only solved issues in certain spaces and led to the exclusion of ordinary citizens. Heaphy (2017) argues that the gentrification promoted by smart districts such as the Dublin Docklands is a key example of the dichotomy between the corporate solving of urban issues versus who is excluded.

The smart city, if situated within a political discourse, could encourage urban developments that benefit as many as possible and allow for debates about what the city should be (Hollands, 2008). But, in its essence, the smart city frames the reality of a city in a particular way excluding the complex political, cultural and societal foundations of cities by simply placing technology as the only solution (Hollands, 2014 and Harvey, 2012). Further, just as the early conceptions of the smart city can be traced to the shift in urban governance in the 1970s, the technological adoptions and innovations that cities are now using are creating a new shift in urban governance from disciplinary, as illustrated through many of Foucault's essays (Foucault, 1977, 1978, 1991 and Gordon, 1980), towards one of control through "algorithmic governance" (Kitchin, 2014b, 179).

## 2.6 Changing Governance: Algorithmic Governance

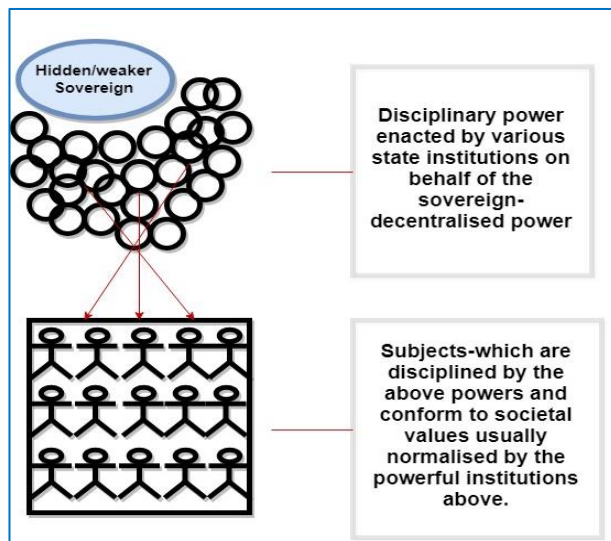
The use of big data and the development of algorithmic governance to manage populations, particularly urban populations, is shifting "the governmental logic from surveillance and discipline to capture and control" (Kitchin et al, 2017:1). The efficiency of algorithmic governance relies on big data which has its origins in the 1990s but since 2013 it has become a popular concept (Kitchin, 2014b). However, the definition of big data is contested with Kitchin (2014a; 2014b: 68)

stating that big data are "huge in volume [...], high in velocity [...], diverse in variety" - the 3 V's of big data (Boyd & Crawford, 2012 and Kitchin, 2014a/b, 2016). Kitchin (2014b) extends this argument by adding in "exhaustivity[...], fine-grained in resolution [...], relational [...], flexible" (p.68), "indexicality, extensionality, and scalability (Kitchin and McArdle (2016:1). Simply, big data are "enormous, dynamic, interconnected digital data sets" (Castree et al, 2013) that attempt to "capture n=all" and differ from traditional small data sets (Kitchin and McArdle, 2016: 8). The advent of big data emerges out of an increasingly technologically dependent society, where streams of data emanate from our phones, laptops, tvs, fridges, social media accounts and watches (Greenfield, 2006). Therefore, every day people are freely sharing their data because they do not understand that they are, and they do not know how not to (Kitchin, 2016).

It is this division between the collectors and users of big data and citizens freely sharing it which changes how urban spaces can be governed. This is linked to the debate on sovereignty illustrated between Foucault and Agamben and highlighted by Kitchin et al, (2017:1) because "just as disciplinary power never fully supplanted sovereign power, control supplements rather than replaces discipline". This new form of urban governance enhances control of the population in a more decentralised manner than disciplinary power which links to Foucault's idea that power is everywhere and Agamben's understanding of sovereignty. Thus, urban governance has morphed into a form of covert permission operationalized by the many not just those traditionally in power, as described in Figures 2.1, 2.2 and 2.3.

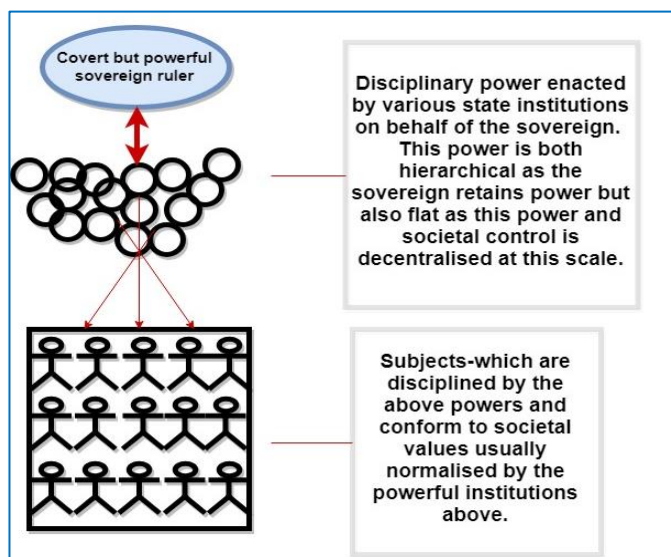


Figure 2.1:Foucault's system of Power



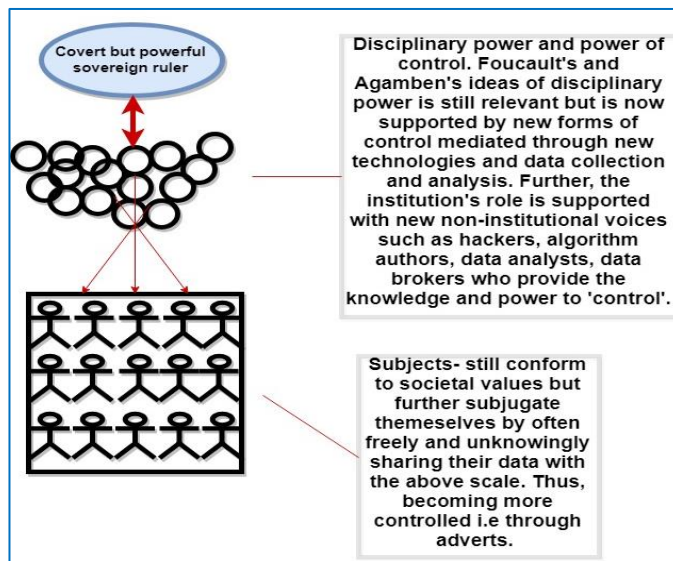
Source: Author

Figure 2.2: Agamben's system of Power



Source: Author

Figure 2.3: The modern power system



Source: Author

It is this shift in urban governance towards algorithmic governance which becomes disruptive for public agencies operating in the city, as the traditional modalities of governing are uprooted, modernised and changed. They become more reliant on data, 'outsiders' expertise and the race for 'smartification' is either forced upon them, happily accepted or they are ignored entirely. However, it is natural for forms of governmentality to change over time (Kitchin et al, 2017; Meijer and Rodríguez Bolívar, 2016; Kitchin et al, 2017; Ong, 2006) when it is contextualised by neoliberalism as various forms of governance are created and applied to different spaces in different ways as a result of varying cultures, societal values, standards and policies. For instance, algorithmic governance is less about subjugation and more about implementing control by analysing personal data and as a result "modulating [their] effects, desires and opinions" (Kitchin et al, 2017:3). This extends Foucault's (1977, 1978, 1991) understanding of governmentality as an act of creating subjects towards one of controlling subjects (Kitchin et al, 2017) as algorithmic governance shapes people through technological processes and software. This transforms how we interact with our city and are controlled and disciplined by it. Two examples of such are control rooms and general ubiquitous technology.

### 2.6.1 Control Rooms

Control rooms pre-date the smart city by decades “utilising SCADA (Supervisory Control and Data Acquisition)” (Kitchin et al, 2017: 8 and Lucque-Ayala and Marvin, 2016) since the 1950s. The SCADA system is a single system with no cross-system capabilities. They usually have a narrow remit of monitoring and responding in real time in what Kitchin et al, (2017: 9) calls a “closed system”. However, as control rooms have modernised they have become capable of watching “ more open spaces” (Kitchin et al, 2017:9). Thus, control rooms are now able to exert more control by micro-managing urban systems, coordination and the deployment of resources (Kitchin et al, 2017; Luque-Ayala and Marvin, 2016). For instance, smart city ideas, integrated urban sensors and big data are creating integrated control rooms where all agencies, feeds and systems are managed via one control room (Kitchin et al, 2017; Luque-Ayala and Marvin, 2016). This type of integrated system is critical for inter-agency coordination as it allows for the collaboration of human and technological networks that are essential to the mitigation and management of urban spaces (Bennett, 2005 in Anderson and Gordon, 2016), especially due to the intense and complex inter-related and multi-faceted systems that maintain the urban (Kapucu and Comfort, 2006 and Kapucu, 2012). Leading examples are the two control centres in Rio De Janeiro; Centro Integrado de Comando e Controle (CICC) and Centro das Operações do Rio (CRO) (Kitchin, 2014c).

These centres were designed to support the FIFA World Cup and the Olympics while tackling population and infrastructure issues (Gaffney and Robertson, 2016 and Brit Lab, 2016) and are deemed as smart city centres with CRO being part of IBM's Intelligent Operation Centres project (Gaffney and Robertson, 2016). They are described as the epitome of smart city control centres, with ceiling to floor computer screens depicting every aspect of the city supported by desks of people watching and analysing every movement in the city (Gaffney and Robertson, 2016 and Brit Lab, 2016). These centres were not implemented without resistance and conflict, for instance, they really only support the centre and affluent spaces of Rio De Janeiro (Gaffney and Robertson, 2016). Even so, they are the first of their kind and are examples for other cities to learn from while taking into account antecedent legacies and social, cultural and political influences.

## 2.6.2 Ubiquitous Technology

Connected to control rooms and a key component of actually existing smart cities (Shelton et al, 2015) is the infiltration of ubiquitous technology within the urban infrastructure to track and manage different aspects of the city (Gabrys, 2014; Wiig, 2015). An all-encompassing term of which ubiquitous technology fits within is “everyware” (Greenfield, 2006) which is essentially omnipresent computing sewn into the urban fabric which connects different systems of the city (Kitchin, 2014a; Graham & Marvin, 2001). It is often unseen but working to make the lives of individuals easier. Greenfield (2006) and Kitchin & Dodge (2011) discuss the practice, ethics and future of ubiquitous computing and how it not only shapes space but also affects the individual by changing how we conduct certain tasks, how we self-discipline and portray ourselves to the world, socialise and learn. This is a new form of governmentality which allows for easier en masse control by agencies and corporations which aligns with both Foucault and Agamben's understandings of governance. In a Foucauldian sense, one might develop the provocation that it forms a new age panopticon in which society is the ‘prisoner’ and control rooms, CCTV and sensors amongst others are the ‘guards’ who may or may not be observing them resulting in a Foucauldian self-discipline but in response to an acknowledgement of sovereign authorities. However, with the removal of the citizen and the use/experimentation of ubiquitous technology under the control of corporations, questions need to be raised regarding the purpose of this data, what it informs, who has access and how it is manipulated to possibly create a false truth (Gabrys, 2014).

This is supported by a Philadelphia case study on an IBM supported workforce training app which aimed “to train up to 500,000 low-literacy residents for jobs in the information and knowledge economy(Wiig, 2015:535) [...] by connecting low-literacy residents with workforce education lessons and through that to employment opportunities in the city” (Wiig, 2015: 536) Essentially, the app was developed as part of Philadelphia’s smart city plan as a method to garner a larger educated workforce to meet the demands of the “globalised economy” (Wiig, 2015: 536) which Philadelphia needed to be competitive within. The app was marketed as a tool to help “marginalised” (Wiig, 2015: 536) citizens to enter the workforce but due to the underlying aim it also was a method of boosterism to international business

(Wiig, 2015). Although, the app was heralded a success, Wiig argues that this is simply untrue as it did not fulfil its purpose of helping people access the job market. Instead, it ended up being “more useful as a promotional vehicle to highlight the city’s global competitiveness than to provide jobs for the people who might have participated in the program” (Wigg, 2015: 547). This case study illuminated how the "smart" city is a mechanism of branding to position the city in the global market and is not a mechanism of positive urban change. Meanwhile, it represents and dismisses the “smart” city rhetoric of it being for citizens when often it is really about profit, data collection and analysis and new forms of urban control.

Thus, the introduction of ubiquitous technology creates a new process of governmentality; we see the dispersion of power between government and corporation in a form of actually existing neoliberalism (Brenner and Theodore, 2002) with the data used to internalise the perceived and actual issues of the city. Solutions are sought by the government from corporations with little evidence of a bottom-up approach, citizen engagement or one that integrates with different agencies. Thus, rather than governing subjects through processes of discipline, society is governed by the analysis and what happens to data, i.e. whether it is sold on to a data broker or altered, as these processes and changes may then create new forms of control and discipline mechanisms.

Both examples masquerade as a solution to urban issues ranging from poverty, traffic congestion to severe weather events (Hollands, 2014; Wiig,2015). However, if we understand the smart city as a "technology-led urban utopia" (Hollands, 2014;1) borne out of multinational corporation support, then one may develop the provocation that the smart city is nothing more than a mechanism of neoliberal policy, not social policy. This neoliberal urbanisation provides the conditions for exploitation under capitalism (Holborow, 2012; Harvey, 2012). Harvey's discussion on accumulation by dispossession as a concept to explain neoliberal capitalist policies from the 1970s onwards is an excellent way of understanding how smart city policy is operationalised. Harvey (2005) argues that the achievement of neoliberalism has been to redistribute and centralise power and wealth for the minority or societal elites rather than the generation of wealth. This has resulted in acts of dispossession against the majority, i.e. the dispossessing of land, public services and environmental degradation or in terms of the smart city, the

covert collection of personal data (Kitchin, 2014c). It is this action that makes the retaining of public services and their assemblages so important. By remaining public it remains under the sovereign and is obliged to coordinate and collaborate with other agencies creating stronger inter-agency networks.

## 2.7 Conclusion-Oscillating Assemblages

So, why is it so important to understand assemblages as fluid entities that can oscillate positions based on need and experience? And, what does this mean for a CMAERAs? Firstly, it illuminates the ‘real’ power networks that shape assemblages. This is imagined in the same way as Moore-Cherry et al, (2014) suggests that the power of visual methods can entice and be digestible for the key players of the state. Following on from this idea, assemblage theory is adapted as both a visual and narrative reading of assemblages to complement its theoretical and philosophical foundations. Thus, it accounts for both the formal networks, as implemented through policy, and the informal networks that develop over time and through agency experience, training and processes. However, most importantly, it allows inter-agency conflict to be minimized while trust evolves because its fostered through formal hierarchical structures but matured in the informal and flatter spaces.

Secondly, the oscillation of assemblages and the power dynamics involved help to protect or at least manage the assemblage in light of a series of complicated aspects of agency institutionalisation and complex reforming of urban governance methods. As urban governance adapts there can be a misalignment of priorities between the national and urban scale and the institutions and agencies operating locally. Further, fractious urban governance can encourage the assemblage to re-shape.<sup>7/8</sup>

Thirdly, the ability for assemblages to oscillate allows for them to adapt easier to changing methods of governance that affect how they operate or the procedures and resources they engage with. This has become particularly evident as cities have become increasingly occupied with techniques of ‘smartification’ (Vanolo, 2016), resulting in cities increasingly being fitted with technological

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<sup>7</sup> For example, Dublin is governed by four Local Authorities and Boston is co-located alongside several other independent cities.

<sup>8</sup> A connecting note for future reference- the governance of emergency management agencies is also problematic as the different agencies that sit within the assemblage are scaled differently, i.e. An Garda Síochána is national but fire is local.

solutions. These new techniques of urban governance will not only further disrupt the shape of assemblages and the operations of individual agencies but also have the potential of encouraging "process(es) of institutional change" as agencies adapt to a more technologically controlled society (Meijer and Rodríguez Bolívar, 2016: 392).

Finally, why does the oscillation of assemblage's matter to how we study a CMaERA? Emergency management systems seek to be a permanent and satisfactory response to normal everyday events such as fire, illness and crime. These are temporary disruptions to the normal running of a city, town or community. Yet, the responding agencies are contextualised within their own persistent cultures and between ephemeral politics, policies and techniques of governance<sup>9</sup>. Further, emergency management theories, at their core, call for policy which is flexible and adaptable. They acknowledge that most emergencies are localized and that first responders have their own informal procedures and hierarchies in which they can self-govern as trust is built in the informal and flatter spaces rather than in the hierarchical spaces. Thus, CMaERAs are normally formal networks that move and blur providing space for informal networks to develop.

This dichotomy between formal policy and informal procedure, between the sovereign authority (policy writers/enforcers) and the providential will of on-the-ground actors within a system of ephemeral political will and changing tactics of governance, create a more fluid and flexible organization of agencies which do not neatly fit into ontological levels 1 or 3 in Brenner et als (2011) schematic for analyzing assemblages. Therefore, within the context of CMaERAs, it is Brenner et als methodological level 2, a messy middle ground, in which we see the assemblage oscillating its position between flat (more informal procedure) and hierarchical positions (formal policy). This freedom of movement which assemblage theory offers is essential for understanding how CMaERAs operate in line with policy and state mandates and how they also re-shape when necessary often going against policy. By framing the research within this perspective, I am able to dissect the agencies, their relationships and processes to begin exploring why as an

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<sup>9</sup> The choice to use 'persistent' and 'ephemeral' over concepts such as 'permanent' and 'temporary' is to recognise that even the most stubborn agency cultures eventually mutate due to wider societal change, new generations, technologies, resources, policy and political effects.

assemblage they may re-shape and morph based on the particular circumstances of an event. The reasons why oscillation and re-shaping occurs will be described in greater detail over the subsequent chapters with the next chapter exploring the methods undertaken to conduct the research.



## Chapter 3-Methodology

### 3.1 Introduction

This chapter outlines the investigative methods used to conduct the empirical research and introduces the different case study cities and events. The body of the chapter is divided into five sections; research design, methodology, methods, ethics and research limitations. Section 3.2 Research Design - outlines the aim, objectives and research question. Section 3.3 Methodology - discusses why a qualitative, case study-based project was undertaken and introduces the two case study events and three case study cities used within this research. This is followed by a discussion of my philosophical assumptions and theoretical framework, which informed the research approach and choice of methods. Section 3.4 Methods - outlines the range of qualitative methods used to answer the research objectives and research question and how the data was analysed. Section 3.5 Ethics - the ethical requirements and considerations related to the research are explored with close attention to my relationship with An Garda Síochána due to difficulty of access and strict legal frameworks. Section 3.6 Research Limitations - discusses the limitation of access, confidential information, slow policy change, and obtaining (full) consent, which affected aspects of the research in different ways.

### 3.2 Research Design

The aim of the research was to understand how CMAERA organise, re-shape and are influenced by broader factors such as urban and state governance, history, geography and institutionalisation and whether these are affected when the CMAERA begins engaging with data analytics and governing via algorithms. This aim was broken down into four workable objectives, which led to a more focused research question.

**Objective 1:** Describe the emergency management systems of Ireland (Dublin and Cork) and the United States (Boston, Massachusetts) in terms of their policy (Chapters 4-5).

**Objective 2:** Evaluate why CMAERA agencies may oscillate away from the designated policy shape into different real-time response shapes, as a reaction to the type of the event, (in)formal relations and power dynamics (Chapters 4-6)

**Objective 3:** Explore some of the cultural and political reasons these systems can fail, such as inter-agency tensions, formalisation, weak governance, geographical exclusion, institutional resistance, training and funding (Chapter 6-7).

**Objective 4:** Assess the relationship between CMaERAs and technology, data analytics and algorithmic governance to better understand the impact of them on the evolution of CMaERAs (Chapter 7).

The aim and objectives developed into a more specific research question as a result of the broad literature and theoretical review outlined in Chapter 2 and from themes identified during early interviews. However, this question was continually re-shaped as the research progressed and became more focused. The main research question was:

How do the variety of actors, actants and technologies involved in emergency management, contextualised within their particular histories, cultures and geographies, assemble and organise?

### 3.3 Methodology

The methodology adopted was qualitative in nature and consisted of case studies aimed at uncovering the assemblage of a CMaERA. A qualitative methodology was chosen because it provides a more in-depth analysis of an aspect or phenomena of the social world (Brikci and Green, 2007). Kitchin and Tate (2000: 231/233) refer to this as ‘thick’ data as it can include an array of emotional, subjective and contextual information, as opposed to more factual and ‘thin’ data that would be acquired through quantitative methods. This was important in order to be able to understand how the structures and organisation of a CMaERA change over time, due to new forms of governance or city management which could not be adequately traced through quantitative methods. However, this was vetoed due to the difficulties in getting the participants to provide the same level of information in a questionnaire as they would in an interview.

To provide structure, a case study approach was used. This approach investigates a subject or issue within “bounded” structures (Creswell, 2007:73) which can be geographical, scales, objects, processes, themes, or through any other form of categorisation, exploring them in depth with multiple types of

information at a longitudinal scale. However, it is debatable as to whether case studies are a methodology per se or just a framing device for bounding the research (Stake, 2005; Creswell, 2007; Denzin and Lincoln, 2005). My personal view matches Creswell's; the case study approach embraces elements of both. It is a methodological approach, but while the case study sites can be choices outside of the research design, they can also be very important decisions that affect the methodological process in terms of influencing how a case is investigated.

Further, the type of case study deployed influences the research design as discussed by Creswell (2007:73) who proposes three case study types: single, collective and intrinsic (Creswell, 2007:73). Single refers to a focus on a single issue within a single bounded study; for example, ambulance coordination in Cork City. Collective refers to one issue explored across multiple case studies, allowing for the illumination of various perspectives and reduces the possibility of overgeneralizing a phenomenon, for example, a comparison of ambulance coordination in Cork City and Dublin City. Intrinsic refers to a study of the entire case, for example, the study of the National Ambulance Service coordination across Ireland. This research takes the collective approach, exploring the consequences of oscillation and external factors such as political will, governance, institutionalisation and (in)formalisation on CMaERAs (the issue) during major emergencies, such as flooding and terrorist events (multiple case studies) across Dublin and Cork Cities, Ireland and Boston, Massachusetts, USA.

### 3.3.1 Case Studies of Events

There are multiple reasons why urban flooding and terrorism were chosen as the event-based case studies. Firstly, urban flooding was my primary and only case study at the beginning of the research because it met four major criteria. Those were:

- It occurs regularly in each of my case cities;
- It is easily accessed, i.e., there appeared to exist no major hurdles in regard to confidentiality issues or sensitive aspects;
- All major agencies should respond to this type of event, so inter-agency coordination can be revealed;

- It can be scaled from local to regional, as the event can cross jurisdictional boundaries.

My secondary case study on terrorism arose when I conducted my fieldwork research. It does not meet all the criteria especially criteria 1 and 2. However, as the research progressed it became apparent that neither of these criteria was exclusively essential. During my first set of fieldwork interviews in Boston in April 2016 leading up to the marathon on April 18th, I noted that my participants were unsure or unconcerned about the possibility of flooding in Boston, although it was a priority within the city's Climate Action Plan. Instead, their concern was mitigating and managing another 'Boston Marathon' type event. After this trip, I chose to still focus on flooding and to use the Boston interviews to discuss the all-hazards approach and how it's not applicable to every event. I was also aware that the time of year when I interviewed respondents could have influenced what they decided to focus on in the interviews. However, after the spate of terrorist events in Europe, I noticed a change in how the Irish participants discussed emergency management. I interviewed members of An Garda Síochána (AGS) a week after the Manchester concert bombing in May 2017. There was a notable shift in what was deemed most important, with AGS being preoccupied with planning for a terrorist event on Irish soil while acknowledging that flooding was still an issue, just not a priority as it had been previous to 2017. This re-focus of priorities within AGS encouraged me to reflect on my decision not to include terrorism as a case study. After researching how other people explore it as a theme in a respectful and safe manner, I chose to use it as a smaller secondary case study building the story around my participant's information rather than through media sources. This decision was made to ensure that victims were respected and that participants experiences were discussed in a caring manner. Both event-based case studies are used as examples to illustrate how CMaERA operate and respond in line with policy and oscillate positions based on the circumstances of activation.

### 3.3.2 Case Studies of Cities

My principal case study was Dublin supported by Cork, with Boston being the second case study. Boston is an asymmetric case study which is not comparative but is still a significant empirical study that helped provide benchmarks in order to understand what is actually happening in Dublin. Cork acted as a

reflexive case study that contextualised the system outside of Dublin. It was only by studying the differences of the three cities, that I could begin to make substantial claims regarding how assemblages are shaped. I chose these three cities because:

- All three cities have a recent history of major flooding.
- They are all adopting smart city tactics for the development and governance of their city, with evidence of flooding being a key part of their smart development programmes.
- Ireland is predominately ruled by a centralised government with the local government accountable to the national scale. Whereas the United States has a highly decentralised government, with the federal government dealing with more significant issues. This creates interesting outcomes for how they are both governed and how their emergency services can respond to events that cross jurisdictional boundaries.
- All three cities function under Liberal Market Economies (LMEs) and its associated characteristics and functions. A LME is characterised by competitive market arrangements, competition, a precarious workforce, formal high-level education, low rate of unionisation, deregulation, tax breaks and innovation (Hall and Soskice, 2001; Soskice, 1990a/b). The opposite of an LME is a Coordinated Market Economy (CME) which is characterised by weak market relations, collaboration as opposed to competition, secure work, high rate of unionization, different scales of education for a more diverse industry, encourages knowledge sharing and inter-agency coordination (Hall and Soskice, 2001; Soskice, 1990a/b). The difference between these two forms of capitalist economies is important to note for the case studies which all function under LME's meaning that issues are solved via the market. This has direct consequences for public services such as CMaERAs. For instance, Regan, (2011: 465) discusses the role of "institutional embeddedness" in Ireland and how this and the Irish LME affected the political choices that were made during the crash. This "institutional embeddedness" is a key characteristic of the IEMA and the USEMA in terms of inter-agency coordination, however, these CMaERAs are further affected by a LME through the privatisation of services, removal of the state, lack of coordination between agencies due to institutional

siloeing, direct market influence on wages and resources and the dismantling of the welfare state removing or curtailing public services. This creates tensions between CMAERA agencies, state departments and citizens as they must function as a public service without the support of welfare state structures and under the auspice of privatisation and market forces. Although the case studies in this research do not operate under a CME, it is important to recognise that CMAERAs would behave and operate differently in countries such as Germany, France and Sweden as a CME offers a greater scale of inter-institutional coordination and active problem-solving at different geographical scales and agencies rather than allowing the global market to determine the solution.

- Both have a form of a CMAERA in place, however, the organisation and effectiveness of the CMAERA differ due to different threats, denser populations, resources, cultures and societal needs.

Cork City, Ireland, was added to the study because of the national scale of An Garda Síochána (AGS) and the National Ambulance Service (NAS). It was inappropriate to only meet with members of AGS and the NAS in Dublin, as that reinforces the centralised view of emergency services in Ireland. Thus, the addition of Cork City offers new perspectives and ensures that the findings were not over-generalized but were representative of the entire system, as much as they could be. The choice of Cork as opposed to any other Irish city was because it has the only inter-agency office in the country which proved to be a great opportunity to unravel the governance issues with a centralised government. In the US, I attempted to replicate this with Quincy or Chelsea City in Massachusetts. Both cities are on the boundary of Boston but are wholly independent with their own emergency services and own modes of urban governance in place. However, after several attempts by myself and colleagues gaining access proved impossible.

Having a qualitative and collective case study research design allowed for the collection of very detailed and extensive data to emerge. It included thematic, historical, geographical, jurisdictional, legal and emotional knowledge that has and will be shared between myself and the participants but also between the three cities through dissemination and conversation. The next section will explore

the philosophical and theoretical foundations shaping the research questions and directions.

### 3.3.3 Philosophical and Theoretical Foundations

My research design and methodological choices are based upon specific ontological and epistemological assumptions, as well as my own personal values and politics. My ontological positioning helped to establish the epistemological assumptions of this research by guiding me to view CMaERAs as live social constructions which morph, shift and re-shape in numerous ways. To capture the aliveness and fluidity of a CMaERA, assemblage theory was considered an appropriate theoretical framework as it captures the establishment of different emergency management agencies, institutions, scales of governance, processes and policies which form as a “stable bundle of relationships and capacities” (Castree et al, 2013:24). However, what really captured the practicality of this theory for this research, was the clear ontological divisions of flatness and hierarchy within Urban Geography, as detailed within the Brenner et al, (2011) and McFarlane (2011 a/b) debate.

Further, this combined well with Foucault’s theory of power, and a pragmatic understanding of CMaERA through early conversations with participants, illustrated four more points as to why it was an interesting way to frame the research. Firstly, CMaERAs, even when weakly coordinated, still come together as assemblages which morph shape depending on the goal, the power dynamics and the (in)formality of those represented. Secondly, by reading assemblage theory through a Foucauldian and Agambien perspective, the idea of sovereign power and institutional power networks demonstrated that society and its inherent assemblages are messy and cannot fit easily within one ontological position. Instead, they are influenced by many external factors such as the role of the sovereign, whether sovereignty is single or characterised by multiple embodied sovereigns and the consequential scales of power as well as their history, geography and cultural contexts. Thirdly, in the case of CMaERA and other assemblages, I am dealing with real people who have natural instincts, memories and positional self-awareness which further encourages CMaERA to re-shape in different and often unforeseen ways. Therefore, assemblage theory contextualised within theories of power provides an interesting perspective for exploring the messy, chaotic and often

disorganised CMAERA by ensuring that the reality of these agencies and their relationship are examined and not just positioned within one school of thought. Instead, I am interested in using assemblage theory in a post-ontological manner.

Finally, the ‘Cities’ Brenner versus McFarlane (2011) debate, illustrated the complexities of understanding urban assemblages. This provided an interesting stepping-stone for beginning to think about the relationship of CMAERAs agencies/institutions and their position and role in urban spaces. Of course, CMAERA are not confined to urban boundaries as they operate everywhere, but the power and influence that acts upon them tend to emanate from urban centres, hence the focus on cities within this research.

All of this is shaped by an epistemological approach from a social assembly perspective. Social assembly is particularly pertinent to the theoretical framework and philosophical assumptions of this thesis as it accepts the social constructionist argument against one ‘truth’, one ontological understanding of CMAERA and instead highlights that knowledge tends to only be the ‘truth’ for the person who disseminated it (Castree et al, 2013). While, for others, their own social reality, circumstances, histories, cultures, genders, power etc. re-create these ‘truths’ within their own perspectives.

However, I move away from social constructionism towards social assembly by understanding society in the same way that Chapter 2 described assemblages. Society and thus, the assemblage which make up society, are chaotic, with various realities and knowledges which represent all actors and actants (Whatmore, 1999; Castree et al, 2013). Thus, in the context of CMAERA and the use of assemblage theory, examining these through a social assembly approach allows for an understanding of how experiences are rationalized, knowledge/policies are interpreted, and emergency response is managed through a model of active social reality. This allows for an exploration into the different ways that power, hierarchies, responsibility, processes, plans and responses are legally written and then how they translate during an actual event. Further, I use it as a reflective mechanism to critically analyse literature, policy, transcripts and case studies which allows me to apply assemblage theory in a more pragmatic manner exploring the embodied nature of assemblages rather than their theoretical foundations.



### 3.4 Methods

As a result of the philosophical foundations and theoretical framework, this research is interpretive. This helped to inform the type of methods I used, keeping in mind, my epistemological approach revealing the social and institutional world of CMAERA based on participants' knowledge (Pizam and Mansfield, 2009). To conduct research in this manner it was important that my methodological choices allowed me to:

1. Build relationships and trust with my participants so knowledge shared was insightful, beyond the party line, and determined how they viewed their agencies and themselves within their CMAERA.
2. Facilitate a snowball technique to reach more participants as the agencies of a CMAERA are often closed off. Thus, snowballing was critical for access.
3. Provide thick data so that an in-depth exploration of how CMAERAs actually operate and are shaped prevailed.

#### 3.4.1 Methods of Data Collection - Interviews

The key method for this research were semi-structured interviews which were conducted across all sites with a variety of participants and stakeholders. The Dublin fieldwork began in October 2015 and the Boston fieldwork was initially conducted in April 2016. Irish fieldwork continued up until May 2018 and Boston fieldwork resumed in August 2017 until December 2017. The addition of other Massachusetts based cities was sought during this period. The addition of Cork began and was completed in June 2017. However, due to time constraints, no direct pilot study was conducted; yet meetings and informal discussions were organised with four key gatekeepers - a member of Dublin City Council, a representative of an NGO, an insurance agent, and an emergency services manager. The possibility of accessing relevant people was discussed in the early stages, alongside consultation with my supervisors and other experts in the field. These discussions informed the direction of the research, illuminating the avenues that would be significant and highlighting the agencies which may be difficult to access i.e AGS. Thus, in the first year the research changed dramatically as more key players became involved and helped the project to grow.

Semi-structured interviews, as opposed to structured interviews, were chosen for four reasons. Firstly, the interviews are still characterised as a formal interview with a set of questions and themes prepared beforehand to guide the conversation, but this technique allowed the conversation to follow any relevant trajectories which the participant initiates (Cohen & Crabtree, 2006). Research of this nature heavily relies on the opinions and experiences of key informants and thus, the interview questions could not be rigid and enforced as participants needed the space to explore issues in different ways and to provide insights that either diverge from original assumptions or introduces new themes and at times new directions for the research. Providing the participants, the space to lead the conversation opened up a number of opportunities for the researcher to really understand the often conflicting and sometimes similar opinions and experiences of urban emergency management.

Secondly, according to Bernard (1988), semi-structured interviews are useful when the researcher only has one chance of interviewing the participant during the research process. This was a concern due to the time pressures the participants were under but also due to the high turnover in emergency management positions.

Thirdly, semi-structured interviews provide trustworthy, comparable and subjective qualitative data that is informed by the participants own social reality and belief system rather than the researchers. Although I acknowledge that the researcher's own ontological and axiological position influences the themes and questions used as a guide and thus, can influence how the participant responds also. Finally, semi-structured interviews are normally combined with other methods to allow the researcher to further develop an understanding of the topic, and in the case of this research, a discourse analysis was conducted (Cohen & Crabtree, 2006).

Fifty-one interviews were conducted during the research process; thirty-six across Ireland and fifteen in Boston. However, one of the Boston interviews needed to be retracted due to difficulties in obtaining consent from the participant. As a result, this interview was never transcribed or analysed.

All but three interviews were conducted face to face with the others via telephone and Google Hangouts at the participant's request. Any follow up questions or interviews were mainly conducted via email or Google Hangouts with

the exception of one. This particular participant requested that I meet up with them again to further advance the research and ensure it was as up to date as possible before submission.

Due to the nature of the interviews, there were normally between ten to twenty set themes, while each interview lasted between forty-five and sixty minutes with three exceeding that time limit as organised prior to the interview. All follow up interviews were kept to a maximum of 30 minutes. The participants were formally approached due to their involvement in a CMaERA and/or the smart city project for Dublin, Cork and Boston. Initial contact with key interviewees was made via email and with follow up phone calls participants were invited to take part. Subsequent participants were recruited through snowball sampling, based on recommendations and introductions made by initial interviewees. Further, the contacts within the wider Programmable City project and those of my supervisors were also beneficial in gaining access to participants. My own personal connections also ensured access to two vital agencies.

There were no major socio-economic divisions to the participants in either Ireland or the US, but racial and ethnic participants were under-represented, with the US fairing slightly better. However, the gender divide is interesting due to the emergency services traditionally being male dominated, but across all the interviews, females represented 29.4% of the participants. This is even more revealing when it is broken down by country. In Ireland, only 17% of the participants were female compared to 60% in the US. Although this research does not focus on gender, acknowledging the gender divide and how it may influence the findings of the research is important, as it represents the progress of these agencies. It will be seen in future chapters that Ireland remains resistant to change while Boston is progressive, and these figures tangentially confirm a change in the hiring practices of emergency response agencies.

Further, as my participants were accessed primarily through a snowball technique, it is interesting to note that my first Irish contact was male, and he provided the majority of my access while my first Boston contact was female, who also provided the majority of my access. Therefore, it could be crudely stated that the relationships within the two CMaERA still have a slight gender divide in

that informal and trustworthy relationships are still mainly with those of the same gender, particularly in such a male-dominated space. Of course, it can be argued that population size, as well as the difference in participant numbers, inflate/conflate these percentages and I accept these critiques but my interviewees are proportionally representative of the emergency services in both countries and thus, significant in relation to how my data was collected and analysed as it supports the social assembly approach that each person, due to different contexts, will view their ‘truth’ in different ways and gender is a key catalyst in that. Thus, this shaped my findings in relation to how the participants interacted with me, how they viewed their position in the assemblage and how inter-personnel or inter-agency power dynamics were actually shaped in reality. In Ireland, the participants were divided into three groups (see Table 3.1):

Table 3.1: CDA Policy Documents

<b>First Responders/Auxiliary (All are CMaERAs)</b>	<b>City, Government bureaucracies and private enterprise (Some are CMaERAs)</b>	<b>Voluntary and others (Some are CMaERA)</b>
An Garda Síochána (AGS)	Smart Dublin	Red Cross
National Ambulance Service	Health Service Executive	Insurance Groups
Dublin Fire Brigade	Intel	Civil Defence
Irish Defence Forces	Dublin City Council-various departments	Met Éireann
Cork Fire Brigade	National Directorate of Fire and Emergency Management	
	Office of Emergency Management	
	Cork Inter-agency Office	

Source: Author

The key participants in Boston were selected before travelling through reading literature specifically on Boston and I relied on a snowball method during the first period of fieldwork in April 2016. During the second trip, between July and December 2017, I had extra university resources that helped me to reach more participants. In Boston, they were divided into the same groups as in Ireland (see Table 3.2).

Table 3.2: Key participants in Boston, Massachusetts, USA

First responders/auxiliary (All are CMaERAs)	City, Government bureaucracies and private enterprise (Some are CMaERAs)	Voluntary and others (Some are CMaERAs)
Boston Police Department (BPD)	A representative of City Hall	Boston Cares
Boston Emergency Medical Service	Department of the Environment	Boston Harbour Now Association
	MassDOT	NOAH
	Office of Emergency Management	EPREP

Source: Author

In both Ireland and Boston, a major agency was missed due to various reasons. In Ireland, the Coastguard were approached a number of times. Eventually, the researcher was close to scheduling an interview when the tragic loss of Rescue 116 occurred. Out of respect, contact was ceased in the immediate aftermath. However, contact was never re-established by them. Boston Fire Department was contacted on numerous occasions by both the researcher, several other gatekeepers and academic staff of the University of Massachusetts, Boston. Eventually, in conversations with colleagues, it was postulated that they are not open to researchers and I decided to write around them.

The issues explored in the interviews differed between participants; representatives of the CMaERA were asked about their role in the group, the overall aims and objectives of the CMaERA, how data is shared between agencies, funding for CMaERA, how CMaERA are activated, the procedure for responding to crises, how CMaERA are influenced by public policy and whether they are aware of any smart city solutions or changes in governance which are affecting/influencing the effectiveness of CMaERA (Appendix 1: Sample interview questions). Other interviewees were asked generally about the smart city, the role of CMaERA in the city, flooding, the role of communities, and the use of data and structures of governance.

All participants in the body of the thesis will be referred to as either their ID number where anonymity cannot be assured. In Ireland, ID numbers

look like ID01 and for the US they are IDA. If the pool was large enough and the quote did not provide any information which could be used to identify the participant then a slightly more detailed reference was provided i.e. 'Representative of an emergency service'.

### 3.4.2 Data Analysis of the interviews

The interviews were transcribed externally, and I started coding through MaxQDA. However, I found that MaxQDA was hindering my analysis as rather than deeply reading the transcript, I appeared to only be scanning for keywords. This resulted in the development of too many codes and sub-codes which were often too narrow. Thus, I ceased using MaxQDA and used Microsoft Word and colour and number codes instead. I recognise that I could have modified how I coded in MaxQDA, but as I was reading the hard copies I was able to limit the codes and pull out detailed key information. I acknowledge that both these reasons are due to personal preference as I find reading and editing on hard copies much easier thus, there is no real methodological reason behind choosing to use Microsoft Word and colour and number codes over MaxQDA.

#### *Coding of Interviews*

The coding of the interviews was split into two sections; pre and post-interviews. Pre-interview codes consisted of creating thematic questions for the interview and then translating these into codes for analysis. However, as the interviews progressed questions changed, and potential codes were updated.

Post-interview coding consisted of a code system of eleven colour and number coded themes (see Appendix 5) related to the research questions. These were then extracted and categorised into similar groups bringing the data together. When each theme had been extracted from all the transcripts, each new group was re-read and edited. Then, more specific codes were applied to pull out the required information. Further, remarkable similarities and contradictions were noted particularly if it was in reference to one of the policy documents. Each transcript was read, and relevant points were number coded. As a result, coding proved to be an excellent method as it emphasised new lines of enquiry and created the building blocks for answering the research questions. After the coding process, interesting

findings were cross-referenced with the literature review and a general interpretive analysis was conducted on relevant policy documents.

### 3.4.3 Interpretive Discourse Analysis

The interviews were supported by an interpretive discourse analysis on two types of data, primary (transcripts) and secondary (archival and active policy). The secondary data was accessed following participant guidance towards relevant policies/documentations. The extent of the analysis varied from general impressions i.e. the policy says x, y and z, towards a more in-depth critical discourse analysis where appropriate. This created a narrative-driven methodology where at one level there is a descriptive, story-telling approach (beginning of Chapters 4 and 5) to a deeper level where critical discourse analysis (CDA) allowed for a more detailed examination of the discourse produced at both the policy and empirical scales (end of Chapters 4 and 5 and Chapter 7). Further, taking an interpretive approach rather than solely relying on CDA meant that any gaps in knowledge or any events that occurred, during the duration of the fieldwork but after an interview had taken place, could be discussed and analysed through various media formats, i.e., newspapers, televised news and social media posts and, if necessary, could then be followed up with participants via email or during follow-up interviews. Although the interpretive analysis on a narrative scale was important for situating the research and providing critical information, it did not result in any major findings. Instead, it set the scene, shaping the interviews and CDA, to focus on what is actually occurring within CMaERA.

CDA is a method of deconstructing language in order to understand the power and different relationships involved in a city and more specifically, within a CMaERA. Kitchin and Tate (2000) propose that the structures of our society, the development of hierarchies, power, alternatives and boundaries can all be understood and are represented through discourse. Therefore, it is their belief that the only way to fully understand these processes is to decrypt the language or "multiple messages" (Kitchin & Tate, 2000: 17) that we are exposed to in our daily lives which further enforce and reinforce our society's values and structures.

CDA is a branch of discourse analysis that was developed in the 1980s (Blommaert & Bulcaen, 2000:447) and it extends upon discourse analysis by

exploring themes of "power and inequality in language" (Blommaert & Bulcaen, 2000:447 and Gee, 2004). It is popular within the social sciences as a method to explore, unravel, contemplate and challenge how language is used within certain social contexts and examines the implications language may have on the construction of societal, political and cultural ideologies (Blommaert & Bulcaen, 2000 and Gee, 2004). Discourse analysis is used to reveal how meanings are established, utilised, challenged and changed as language supports social, political and cultural formation. Thus, by analysing discourse we begin to understand the social world and how language is used to portray certain meanings and world views, and in turn, this influences how we understand our position within society or within an institution or assemblage.

CDA takes discourse analysis a step further by attempting to analyse and explicate how different realities favouring dominant forces are constructed within society, resulting in the illumination of societal issues (Blommaert & Bulcaen, 2000 and Van Dijk, 1993). Therefore, CDA explores discourse in relation to issues that are created and reinforced by dominant powers, such as identity, technology, processes, roles and position. Undertaking a critical discourse analysis allowed me to deconstruct language to uncover practices within institutions through the lens of power. This allows language to be understood as a social practice that illustrates how it can be shaped and changed to suit certain circumstances, spaces, institutions, or forms of dissemination. By grappling with this, it is easier to reveal how institutional cultures develop and in turn how they affect inter-agency coordination. A critical discourse analysis also links with the Foucauldian and Agambian research design as both are concerned with power, with Foucault being particularly interested in discourse as a form of power. By considering power as a discourse and critically exploring this, it is easier to reveal how society, institutions and assemblages are shaped and organised especially in terms of their history, geography and culture and that social construction is linked to actions that are connected by language (Burr, 1995).

The dichotomy of language and power is particularly interesting because language is not neutral. It represents the nuances and realities of societal power by purveying certain intentionalities, authorities, meanings and beliefs. It also acknowledges that language can change truths or present alternative truths based on



word choice and meanings (Burr,1995). Thus, connections are made between language and the actioning of power which reveal how dominant agencies create a reality or story that reflects their truths. However, language is borne of a person, thus, the power lies with the person not with the language itself, but with how the language is used, understood, twisted or ignored. Language is then the vehicle that drives social reality with humans as the drivers.

This understanding of language and power influenced how CDA was conducted within this research and on the choice of documents analysed. Initially, the CDA began by analysing publicly available documents originating from emergency management agencies and the smart city. However, it became apparent that not all were necessary and not all could be accurately analysed and explored within the thesis as there was an abundance of archival and active policy of which some was outdated, inaccessible, and irrelevant. The CDA then evolved into a study of policy documents that were given to me by participants or were mentioned on numerous occasions across several interviews. In Ireland, most policy documents are publicly available, and the participants were eager to share them with me. In Boston, it was the opposite. The participants did not provide any documents apart from the 'Climate Action Plan'. I also struggled to find any policy online, instead general but limited information is shared on various sections of government websites. I spoke to one of the key participants about this and they agreed that these policies are not publicly available and that I would be best to use available website resources if any. However, through library searches and university access in the US, I was able to obtain key policy documents as listed in Table 3.3. Yet the choice to not have the documents in the public domain, and also the choice of what information is shared, is in itself an interesting finding in a CDA project. CDA was applied to the following documents:

Table 3.3: CDA Policy Documents

Irish Documents	US Documents
Framework for Major Emergency Management	Climate Action Boston
Dublin City Council Flood Emergency Plan	FEMA website and online policy
The Planning System and Flood Risk Management	Massachusetts Government
A guide to Flood Emergencies July 2013	Boston City Government
A guide to Local Co-ordination Centres	MEMA website and online policy
A guide to Planning and Staging Exercises	Stafford Act 1978
A guide to Preparing a Major Emergency Plan	National Response Plan (2008), National Response Framework (2009/2013)
Inter-agency Public Communication Plan Media Liaison	Massachusetts Comprehensive Emergency Management Plan 2017
A guide to Severe Weather Emergencies	Disaster Relief Act (1974, 2000 and 2006)
A guide to Host Nation Support for the Principal Response Agencies	GOA 2006
A protocol for multi-agency response to Flood Emergencies.	
An Garda Síochána Policy	

Source: Author

Certain questions were asked of these documents. These were developed with help from Moriarty's lecture slides for Discourse and Analysis at the University of Limerick Winter School (2015) and include but were not limited to the examples provided in Table 3.4.

Table 3.4: Sample questions used in CDA

Questions	
1.	How do the policy documents relate to their current situation and institutional culture?
2.	Are these documents a method of social practice/expectation?
3.	Do these documents reveal the thinking or beliefs in these agencies?
4.	Do they represent any aspects of power or hierarchy?
5.	Does the chosen language have any implications or particular consequences? linguistically?
6.	What traits, characteristics, qualities and features are attributed to agencies, objects or processes mentioned in the policies?
7.	If exclusion and inclusion are present, how are these justified? What are the contexts that surround this? Are they mitigated or increased?
8.	Is there a manipulation of agency transparency? Does this create a view of power, responsibilities and blame?
9.	Does the policy rely on or challenge any common ideologies?
10.	Does the policy reinforce or challenge how society works in terms of urban governance and temporary political systems?
11.	How does the language present the intention of the policy?
12.	Do the documents rely on a particular level of shared knowledge?
13.	Do the words chosen have a power? Could alternative less politically hot or power drenched words have been chosen? Would this have altered the intentions of the policy?
14.	How are words co-located?
15.	Are any euphemisms used?
16.	Are words formal or informal or mix-matched?
17.	Are metaphors used?
18.	Are words chosen with an ideology or position in mind?
19.	Is agency clear?
20.	What pronouns are used? Is it us versus them or is it us collectively?
21.	Are sentences passive or aggressive and positive or negative?

Source: Moriarty (2015)

Further, there is particular attention placed on the societal and institutional contexts of how these policies are written. The societal refers to the historical, geographical, political and cultural contexts of these agencies. The institutional refers to how the specific agency involved and how that affects the discourse.

Finally, CDA has two major criticisms. Firstly, is language really reflective of power dynamics? The choice of language can often create inclusiveness

and exclusiveness. For instance, if technical jargon is used then it excludes those not familiar with that language. Further, language choice can reflect hierarchies, biases and prejudices. Whether language can truly capture power dynamics is beyond this dissertation, but I believe it can and I argue that the use of jargon, the blacking out of language and the choice of metaphors, pronouns and passiveness ensures that the reader internalises the document in relation to their knowledge and position. Therefore, the choices in how the language is executed have the power to both inform and segregate. To try and minimise any issues with how I internalise the documents, I qualify the CDA with data from interviews and literature.

Secondly, the researcher can apply the CDA in a certain direction by carefully choosing the policies that are chosen (Breeze, 2011). To overcome this issue, I allowed my participants to inadvertently choose my policies thus, adding a random variable to the method and one that removes any bias on my part, but I accept that my own perceptions and beliefs will still influence my interpretations and I contend that this is an acknowledged aspect of all qualitative research.

### 3.5 Ethics

Ethical clearance was granted on the 22nd September 2015 by the social research ethics subcommittee of Maynooth University Research Ethics Committee (Appendix 2) and extended on June 15th, 2017. All participants in this research were required to read and sign an informed consent form (Appendix 3) along with an information sheet (Appendix 4). I provided three opportunities for my participants to read through, consider and accept or decline consent. Firstly, the documents were sent to them via an invite email. Secondly, during the confirmation email which was sent 2 days prior to the interview. Thirdly, I brought them along on the day to ensure that the participant was aware of the study and the potential outcomes. This proved especially important in cases where confidentiality could not be ensured as senior-level emergency management is quite small, and I found on numerous occasions that a participant would say “Oh, you interviewed x,y,z last week”.

Thus, during initial contact and at the beginning of the interview, it was explained to all participants the purpose and nature of the research, why they were chosen, any risks that might be involved in terms of confidentiality and the

coding, analysis, storage and sharing of information. They were offered the opportunity to ask questions and have such questions answered both before and after interviews. In addition, they were advised that they may withdraw from the process up until May 2016 initially and then until May 2018 to allow the write-up of the research to commence. Further, permission was sought to record all interviews. In regard to the CDA, most documents used were already in the public domain, but permission was sought for the use of any private documents prior to inclusion.

This research was not directly working with any vulnerable group; however, the researcher was aware that members of the CMAERA, especially first responders, could all be deemed vulnerable while discussing emergencies as the researcher was unaware of any past traumatic incidents they may have experienced. Thus, all participants were provided with four assurances before the interview:

- The interview would cease if requested;
- The participants may be accompanied to the interview;
- The researcher will follow up with the participants to ensure their well-being;
- The participants can nominate a secondary person to read and edit their transcript if they so wish.

All data was anonymised even though the majority of participants were happy to be named. A spreadsheet of participant names was kept on a separate encrypted hard drive from the transcripts. Thus, only the researcher knew which interview belongs to which participant. Due to time constraints transcribing was conducted by an outside source that was vetted by the University and signed non-disclosure agreements. All audio sent to the transcriber was edited and anonymised beforehand. All analysis was done solely by the researcher.

Identifiers were removed at the first possible instance - that of audio editing. After transcribing, all files used ID codes and pseudonyms. The spreadsheet containing identifiable information will be retained by the researcher for administrative and legal purposes. It will not be shared beyond co-researchers, and it is encrypted and stored separately to the data. In the case that confidentiality cannot be ensured, i.e., due to the weight of a job title or easily made connections due to the

information revealed, this was clearly discussed with the participant and all measures were taken to ensure the participant was comfortable and happy to continue.

Collected data, in the form of audio files, transcripts, photographic material and data analytics are being stored on an encrypted laptop with backups stored on encrypted drives archived within the department during the period of research. As with the overall Programmable City Project, it is intended, with the written permission of those interviewed, that the data will be made available to the Irish Qualitative Research Archive (IQDA) as it is the central access point for qualitative social science data generated in or about Ireland. Any data made available to the IQDA will only be stored with the consent of the participant. The data will be archived in the Irish Qualitative Data Archive and follow the archiving procedure set out by the IQDA/DRI (Digital Repository of Ireland), with appropriate levels of access set by the participants of the study. This archiving will not include the spreadsheet containing the identifiers. Consent for archiving and re-use of data was part of the consent process. The majority of participants agreed, and it complies with my guarantee of anonymity as all identifiers were removed. The length of time to be housed in the archive is indefinite.

Where consent for submission to the IQDA was not given, the data is being retained securely by the researcher for a minimum of ten years as stipulated in the Maynooth University Research Integrity Policy. The data pertaining to such interviews, including electronic notes and metadata is being stored on an encrypted hard drive for that period. The key containing the codes matching the data to the relevant participant is also being stored on a different encrypted hard drive located elsewhere. Any hard copies of the transcripts or notes will be destroyed immediately after completion of the VIVA and termination of the project, using confidential shredding as approved by the University. After the ten years, all the transcripts, electronic notes and metadata in my possession will be destroyed using appropriate tools to delete and overwrite the content. This will be overseen by the projects Principal Investigator and executed by the technical support team within the Maynooth University Social Sciences Institute. All consent forms are confidentially stored within the University.

### 3.5.1 An Garda Síochána Research Requirement

To undertake research with An Garda Síochána, I had to undergo their research approval process. This involved filling in three detailed forms regarding: my research, who I wished to interview, the types of questions and how all data will be used, stored and destroyed. I also had to agree to share all findings with An Garda Síochána and be willing to provide a lecture or presentation on my findings, if requested. The forms also had to be co-signed by my supervisors and the Maynooth University legal team were advised of the situation before submission to ensure my rights as the researcher were protected. Further, as I interviewed the initial representatives, the snowball method inadvertently occurred, but to be able to interview the suggested interviewees I had to re-submit the forms. As a result, my fieldwork was delayed a considerable amount. I have included the main form in Appendix 6.

### 3.6 Consultative Process

Due to the nature of this research, consultation with key participants and representatives of different CMAERA agencies was crucial, particularly in Ireland, as the IEMA system is quite informal, messy and difficult to fully comprehend or engage with as an outsider. Therefore, I would regularly consult with three or four different IEMA representatives whom I developed a working relationship with to discuss my interpretation and understanding of the IEMA. This consultation process was beneficial to this research as I could question my understanding of terminology, processes and relationships which they would then either corroborate or educate me on. However, this process proved most advantageous in terms of my conceptualisation of the IEMA within diagrams. For instance, Figure 4.1 in the next chapter proved incredibly difficult to create due to the messy formation of the IEMA. Imagining and trying to draw what this system looks like was a feat that I, my supervisors and my participants struggled with. However, through numerous consultations, this diagram, as confusing as it is, was considered the best representation of the IEMA and one that I can defend.

This consultation process also occurred within the US case study but in a more time limited capacity. While, I was living in Boston, I was

able to ring and question participants about issues I didn't understand but I was also able to converse with colleagues in my host university. It was a different type of consultation than in Ireland but still proved useful for confirming certain things such as the effects of 'Home Rule' on Massachusetts and the operation post the bombing.

### 3.7 Research Limitations

There were several limitations within this research.

- Access
- Confidential information
- Slow policy change
- Obtaining (full) consent

Access to relevant agencies was easier in Ireland than in the US. The only major Irish agency I failed to access was the Coastguard. Access was made easier by the small scale of emergency management in Ireland which facilitated a snowball technique. Access was a major issue in Boston as I planned to replicate my Irish fieldwork and interview the same or equivalent agencies. This should have been made easier due to my extended stay there in 2017. However, there was a lot of resistance to participating and very few participants were willing to take part in the snowball method for reasons that are still unclear. Several agencies repeatedly ignored my requests as well as those made by the staff of the University of Massachusetts, Boston. Agencies that did respond never provided a reason beyond they are too busy to facilitate the research. Due to these access issues, my Irish case study could not be fully replicated. As a result, this research is not a full comparison but rather an asymmetric narrative of three cities. The participants in each city are highly interested in learning about each other and as a result, I will provide feedback and I will ask for those findings to be shared amongst the agencies that were not involved.

Secondly, confidential information was a limitation in two ways. Firstly, at certain points discussions could not continue, or points could not be clarified as it drifted into confidential territory. This means that some of my transcripts or points are vague and underdeveloped. However, this was only a problem with An Garda Síochána and Boston Police Department, but both were



happy to speak on issues as far as they could. Secondly, I was told information or became privy to certain documents that are not in the public domain and will not be in the public knowledge. This was often acknowledged by the participant who requested it to be edited out or placed off the record. At other points, I made the decision based on quick searches for the relevant documentation in the public sphere. If I could not find the document publicly, then, unless direct permission was received, I did not analyse it.

Thirdly, slow policy change means that my research was always positioned in a sphere of slow change. After each emergency, the response is evaluated, and policy is updated to reflect those changes. However, this process can take an indefinite amount of time. Thus, any policy reflections from later stage events such as Storm Ophelia, will be missing from the research or will be completely speculative on my part or the part of my participants. Further, it was revealed in November 2016 that the Framework was being revised and updated. I kept this planned update in mind throughout the research, but I recognised that, firstly, my dissertation would primarily be based on the 2006 Framework, and secondly, that any changes in the new Framework may re-situate my findings. However, as of October 2018 and from a follow-up discussion with a participant, it appears that this new edition has been placed on hold with no real indication as to why this is the current state of play.

Finally, obtaining (full) consent was straightforward for most of the interviews. However, a few participants did request that I do not quote them or refused to fully engage with the consent form. In these cases, I have transcribed and coded the interviews and I have sent the transcripts to them (as with all participants) and requested their edits and if they would like to re-think their level of consent. I have also said that I will send them the chapters with their quotes highlighted for approval. In relation to AGS, I was legally required to send my dissertation to them for approval with their interview quotes highlighted. This is a concern as they can withdraw permission for all AGS participants at any stage which may have dire effects on the narrative of my empirical chapters. After the thesis is submitted to the exams office, the relevant sections will be sent to AGS for review. If they require anything to be removed this will be done post-VIVA.

### 3.8 Conclusion

To investigate ‘how the variety of actors, actants and technologies involved in emergency management contextualised within their particular histories, cultures and geographies assemble and organise’ the research design included a qualitative methodology with a collective case study approach. This was supported by a clear philosophical foundation of social assembly aligned with the theoretical framework described in Chapter 2. Based on this design, semi-structured interviews and an interpretive narrative driven methodology was conducted within Dublin, Cork and Boston with particular emphasis on CMaERA organisation and the two case study events. The next two chapters are going to explore the policy and activation of the Irish Emergency Management Assemblage (IEMA) (Chapter 4) and the United States Emergency Management Assemblage (USEMA) (Chapter 5).

## Chapter 4: Irish Emergency Management Assemblage

### 4.1 Introduction

The aim of this chapter is to provide a deep exploration into the history, policy and activation of the Irish Emergency Management Assemblage (IEMA) to contextualise the evolution of the assemblage and evaluate why a CMaERA may oscillate positions between policy and activation. There are three objectives to this chapter:

**Objective 1:** An exploration of the historical adoption and evolution of emergency management in Ireland.

**Objective 2:** An in-depth interpretive analysis of the key policy documents supporting the formation and operation of the IEMA.

**Objective 3:** The analysis of the winter storm events in 2015/2016 to illustrate the re-shaping of the IEMA from policy to activation.

The IEMA consists of first responder agencies, government departments, voluntary agencies, private enterprises and other organisations of value, as well as technology, processes and cultures (see Figure 4.1). Formally, the IEMA assemblage is hierarchical with clear networks of power, with most everyday emergencies and local major emergencies being dealt with by first responder agencies and, at times, their bureaucratic parents (e.g. the National Ambulance Service (NAS) and the Health Service Executive (HSE)). However, there is procedure in place for a local emergency to be escalated up to a regional or a national emergency. Each scale has their own teams and groups, with every agency represented at each stage. However, as will be evidenced in this chapter there is a more informal co-locating of agencies and departments in a flatter decentralised manner with obvious slippage between scales which is left undiscussed across the breath of policy.

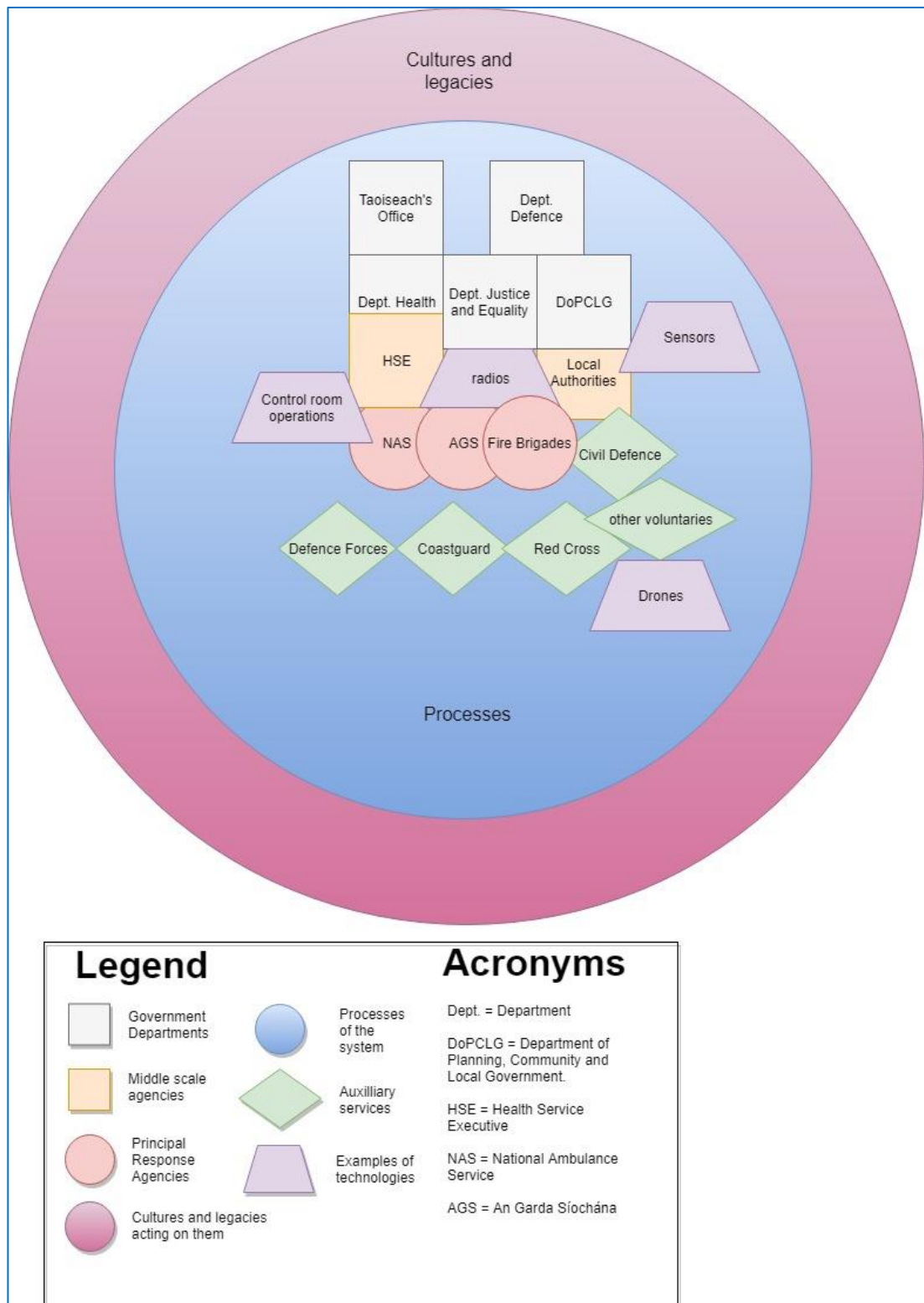
The anchor policy for dealing with major emergencies as opposed to everyday ones is the “Framework for Major Emergency Management” (MEM, 2006a), from herein referred to as the “Framework”. This document and the Strategic Emergency Management National Structure and Framework (SEMNSF) document

will be the key policy explored within this chapter pulling on supportive documents, guides and protocols when necessary.

Using these documents, and the expert interviews, this chapter will provide an overview of the Framework and an exploration into the relationships, contestations and repetitive elements of the different scales of the IEMA. This will include five assessments as to how policy and policy decisions influence the shape of the IEMA: sovereign power, decision-making; unaccounted silo legacies; geography of Framework development and linguistic choices

By demonstrating the different scales and shapes of the IEMA, the chapter then proceeds to provide a comparison between the policy-shaped IEMA and the active IEMA. To help with this, the section begins with a deeper overview of the Flood Guidance document to show how the agencies should coordinate during a flood event in line with the Framework and SEMNSF. This then leads onto an exploration of the 2015/2016 storm season in Ireland which resulted in major flooding and mass devastation across the country. This includes a detailed analysis of the role of the event, how inter-agency coordination was created or destroyed and its resulting effect on the shape of the assemblage.

Figure 4.1: The Irish Emergency Management Assemblage



Source: Author

## 4.2 The Adoption of Emergency Management in Ireland

Irish Emergency Management policy remained relatively undeveloped until the production of the “accident plan” in 1974 (McMullan, 2010). This was the first evidence of a push towards inter-agency coordination as it discusses procedures for declaring emergencies and also detailed coordinating procedures for the different emergency service organisations which would be involved in a major accident, including an Garda Síochána and the Fire Brigade. However, further development in emergency management in Ireland usually only occurred in the aftermath of a major crisis. The following six events are key moments that contributed to the creation of new policy, guidance documents and pushed IEMA policy to evolve.

- **Event 1: The fatal Buttevant Rail Crash 1980:** In the aftermath of this crisis the Department of Health organised a conference to review the response and explore how plans could be re-evaluated to meet the needs of major incidents (O’Riordan, 1992). Thus, the Major Accident Plan and Guidelines were produced, including more detailed information regarding the roles of the other response agencies and also, the roles that voluntary services and the army would have (McMullan, 2010).
- **Event 2: The Stardust Tragedy 1981:** Under pressure, the Minister for Environment requested that all local authorities develop emergency plans that followed his Department's guidelines which gave little heed or consultation to the guidelines developed by the Department of Health the previous year, resulting in two sets of guidelines for managing major accidents that were significantly different causing tension between both departments (O’Riordan, 1992 and McMullan, 2010).
- **Event 3: The Big Snow 1982:** As a response to heavy blizzards, the Department of An Taoiseach organised and chaired an inter-departmental committee with representatives from several government departments including “Environment, Justice, Health and Defence” (McMullan, 2010). They produced the draft of the ‘Framework for Co-Ordinated Planning for Major Emergencies’, the first major inter-agency framework for Ireland. And, after a number of years of feedback and consultation, the Department of the Environment was assigned the lead agency for emergency management

within the Irish State (O’Riordan, 1992 and McMullan, 2010). Over the following years, a lot of planning was done at both the national level and at the operational level thus, by 1986 most agencies had produced and exercised plans (O’Riordan, 1992 and McMullan, 2010). However, O’Riordan (1992) asserts that two key hopes of the departmental committee had been ignored; “comprehensive hazard analyses” and “the co-ordinating groups were not involved in the preparation of the plans” (McMullan, 2010).

In 1986, a new departmental committee was convened to assess emergencies before they occurred, however, it still had the same departmental representatives as before. They evaluated the previous package and all exercises that had occurred and in 1989 concluded that the current emergency management system was satisfactory (O’Riordan, 1992 and McMullan, 2010). But, as O’Riordan argues although, there was a satisfactory emergency management system in Ireland, the idea “of a nationwide series of co-ordinated plans, prepared by an inter-organisational co-ordinating group, on the basis of local hazard and resource analysis, which would be exercised and tested at regular intervals, appears to be quite some distance from reality” (O’Riordan, 1992;57 and McMullan, 2010). The 1984 Framework survived for twenty years before it was reviewed and the current Framework for Major Emergency Management (2006) was accepted by the Government. This framework is now currently under review as of November 2016. However, since 2006 several events have led to the issuing and revision of guidance and protocol documents by the MEM (Major Emergency Management) team to accompany the Framework. Just two examples of these events are listed below and one potential event which may also feed directly into the editing of the Framework as well as the revision of guidance and protocol documents.

- **Event 4: Flooding 2009 and 2011:** Areas of Ireland have always been prone to flood events, but November/December 2009 and October 2011 resulted in a series of extreme levels of precipitation (McGrath, 2016). These rare events combined with the increase in property built on floodplains during the property boom resulted in flood devastation never before seen on a national scale. This prompted a review of the then current flood guidance document based on “feedback received from the Principal Response Agencies in the aftermath of the serious flooding experienced in parts of the Country” (MEM,

2013) and in 2016 a “Protocol for Multi-Agency Response to Flood Emergencies” was issued by MEM.

- **Event 5: Series of ISIS and lone wolf terrorist events across the globe particularly Manchester and London in 2017:** Due to the increasing extent and evolving types of terrorist attacks on the continent and worldwide, the Major Emergency Management team have begun writing guidance documents for such an event occurring in Ireland. I was briefly shown the draft during an interview in early 2017 but it has either not been published yet or is unavailable to the public. There have also been more inter-agency training days for response to terrorist attacks (The Irish Times, 2017; The Journal; 2018). This is an interesting moment in Irish emergency management as there is a need for significant preparation prior to an attack occurring rather than post attack. This is a significant evolution in how emergency management theory develops in Ireland.
- **Event 6: Storm Ophelia October 2017:** This was a significant weather event for Ireland that required a national red alert, activation of a national emergency protocol and the deployment of all response agencies. As is good practice, this event will be reviewed and may result in a significant change in guidance or protocol documents going forward. It also may contribute to the editing of the Framework.

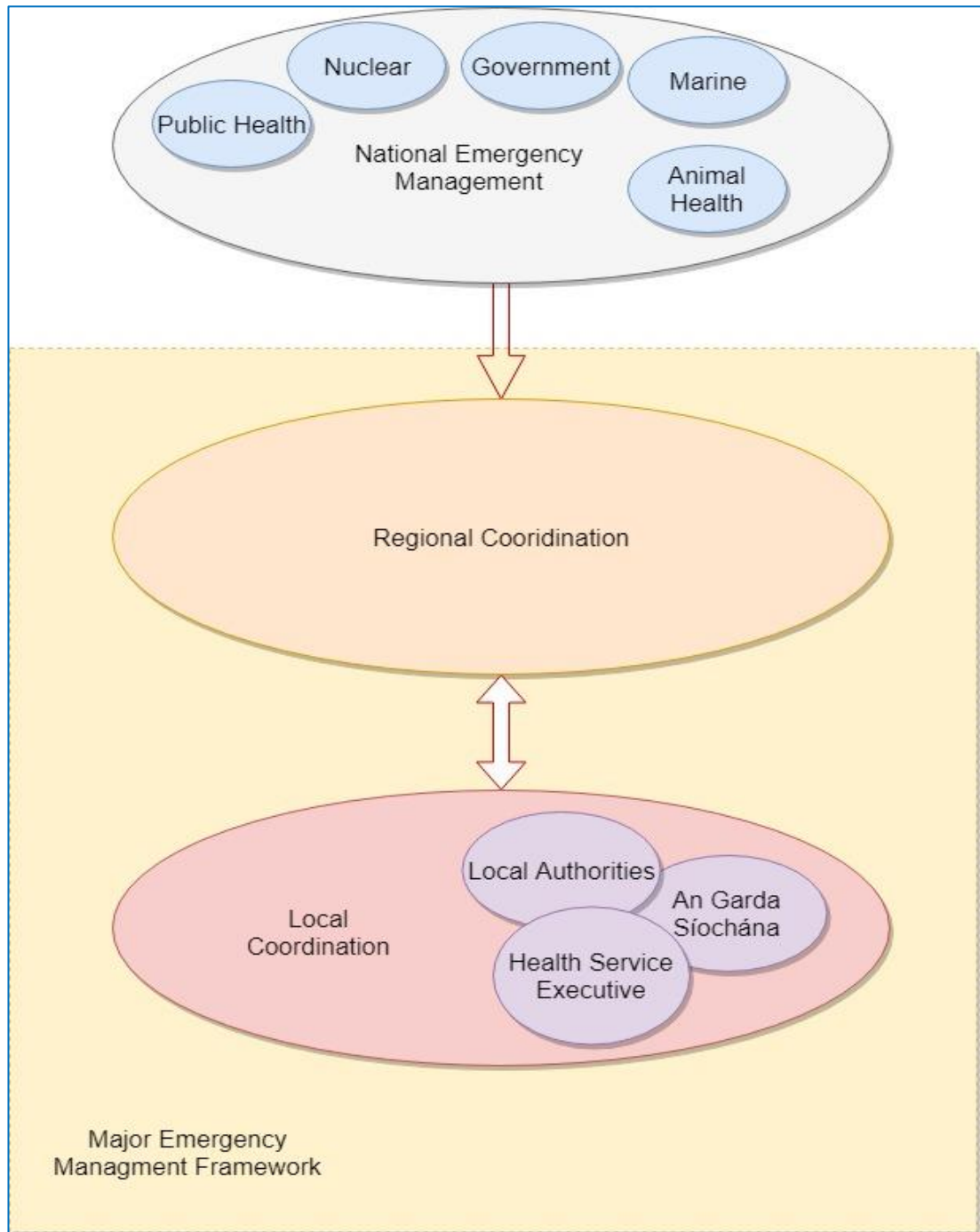
#### 4.3 The Framework for Major Emergency Management

The Framework for Major Emergency Management is the overarching policy document for the handling of emergencies, crises and disasters in Ireland. It was compiled by a national steering committee and approved by the Government of the day in 2006 replacing the Framework for Co-ordinated Response to Major Emergency, published in 1984 (MEM, 2006; 2015). Both the 2006 and 1984 Frameworks were developed as a response to the first three events and numerous other ones that occurred over the decades. While, the final three events are contributing to the development of new policy guidance documents around flooding in 2013 and terrorism in 2017 they will eventually inform the new edition of the Framework. But as can be seen in Figures 4.2 and Table 4.1, the current Framework remains as the overarching and anchoring policy document for agencies responding at the local or regional scale. The national scale of the IEMA is not governed by the



Framework for Major Emergency Management, although it does keep in tone with it through the Strategic Emergency Management National Structure and Framework document.

Figure 4.2: Linking Major Emergency Plans with National Plans and Other Plans.



Source: Redrawn from a Figure in the Framework for Major Emergency Management (MEM, 2006: 39).

Table 4.1: Geographical hierarchy of response as outlined in the Framework

Geographical area	Details
<b>Local/agency level</b>	Principal Response Agencies coordinate response.
<b>Regional level</b>	Regional Steering Groups would promote interagency coordination across regional spaces.
<b>National level</b>	In the case of emergencies that are long-term or cover or have the potential to cover a large geographical area of the island of Ireland, the response is organised and led by the parent department of the PRA's through a National Steering Group and emergency plan

Source: MEM (2006)

The Framework was developed through an inter-departmental committee, since replaced by a National Steering Group (NSG). It was originally drafted by an inter-agency Review Working Group comprised of members from An Garda Síochána (AGS), the HSE and Local Authorities. Currently it, and its accompanying guidance and protocol documents, are led and supported by the Major Emergency Management (MEM) Team in the Directorate of Fire and Emergency Management, located within the Department of Housing, Planning and Local Government. In 2006, this was the Department of the Environment, Community and Local Government (MEM, 2006).

The Framework provides a general overview of the procedure and steps of action to be taken by each Principal Response Agency (PRA) (i.e., Local Authority, HSE and AGS), utilising the all-hazard approach, while also providing limited direction as to how external agencies, such as voluntary services, work alongside the PRAs (MEM, 2006). Other actions it describes are:

- Declaring a major emergency;
- Information on inter-agency co-ordination;
- Command and control;
- Sharing and use of resources;
- Allocation of responsibility;
- Common Terminology;
- The management of crises that are a direct consequence as a result of the original event. (MEM, 2006)

Further, the Framework acknowledges that it can only be effective if each PRA develops and establishes their own protocol of procedures. These specific protocols are often done at both an agency and local level ensuring that the Framework as a generic plan is applied at the local scale in a more efficient manner. By creating individual plans, each agency is planning for a range of emergencies within their own capacities and knowledge of the area. Local knowledge is particularly important for the mitigation and management of an emergency as it ensures more trust between the agency and community and a better knowledge of weaknesses in the area or team. This also feeds into the importance of the formal/informal dichotomy that becomes very evident across the IEMA as it is dissected. For instance, the Framework and individual plans create very formal networks, but there is a sub-culture of informal networks that help make the IEMA work. This informal aspect is not covered in the policy but is a theme that was continually advocated by the participants and becomes increasingly important in future chapters.

In support of the Framework, the Major Emergency Management National Steering Group have also produced guidance and protocol documents that focus on more specific aspects of the Framework and specific incidents that are a high risk in Ireland, such as flooding, to ensure a uniform response across the country. Examples include: “A Protocol for Multi-Agency Response to Flooding” (MEM, 2016); “A Guide to Severe Weather Emergencies” (MEM, 2010); and “A Guide to Flood Emergencies” (MEM, 2013).

The Framework is a guide for agencies responding to emergencies and as it is written with the underpinning philosophy of the all-hazards approach it adequately prepares agencies for every eventuality. However, it is not without its complexities, contradictions and critiques. At times, inconsistencies and language of political power and control are evident.

One short introductory example is that the Framework refers to the writers being the “Review Working Group supported by the Department of Environment, Heritage and Local Government” (MEM, 2006:10) under the “aegis of the Inter-Departmental Committee on Major Emergencies and has been approved by Government decision.” (MEM, 2006:11). Yet, on the same page it is recognised that

the Inter-Departmental Committee on Major Emergencies is now the National Steering Group (NSG), which according to Appendix F2 of the Framework is a group “chaired and supported by the Department of Environment, Heritage and Local Government and consists of representatives of” (MEM, 2006: 9) various government departments as well as key emergency service agencies and local authorities. It is now chaired by the Department of Housing, Planning and Local Government. The National Steering group refers up to the Inter-Departmental Working Group (IDWG) on Major Emergencies, with the IDWG being the liaison between government and emergency response agencies while the National Steering group oversees the national implementation and revision of the Framework. However, there is also a Task Force that lies on, or slightly above, the same scale as the IDWG, which the NSG also reports to. The Task Force “co-ordinates and oversees the emergency planning activities of all government departments and public authorities” (Citizens Information, 2017).

What the above paragraph illustrates is a hybrid, messy, confusing, disjointed and duplicated form of governance that represents several government objectives and provides a small snippet of the power relations that are operating within the IEMA that are now explored further.

#### 4.4 IEMA - Local/Agency Scale

The Strategic Emergency Planning Guidance document was produced in 2004 by the Department of Defence for the national scale. It implemented the use of assigned lead government departments with the Framework adopting the idea at the local scale. The Principal Response Agencies are the designated lead agencies at the local and regional scale, with each being pre-assigned certain events in which they take the lead. For instance, the local authorities take the lead for flooding, AGS take the lead for terrorism, and the HSE for health-related incidents. There are two methods to assigning a lead agency. The first is by pre-assignment, the second is by default. The default agency is the Local Authority which is required to manage emergencies that do not fit into assigned categories. The Fire Brigade is not a designated PRA as they fall under the remit of local authorities. However, their senior officers are critical in the different steering groups, as discussed by Participant 1 of ID13 a senior officer in the Fire Service:

“I think we certainly would be very proactive in driving the policy as an organisation. So, we are looking at the requirements from the national directorate in terms of the, if you take flood as an example, we have a flood guidance document which each Local Authority should comply with in terms of their planning arrangements. So, we would take that document and adapt it within Dublin city. That level of policy and the way we ensure that we are in compliance with that, with the development of flood plan arrangements which we currently have. We have done a workshop, which we chaired and facilitated that ... and it was very positive.” (Participants R1:1D13)

Under the PRA’s are auxiliary services such as the Coastguard, Defence Forces, Red Cross and Civil Defence, amongst many other private voluntary agencies. The Coastguard is interesting due to its positioning at the local/agency scale. At the Major Emergency Management Conference in 2016 it was announced that the Framework was going to be revised. Consequently, a member of the audience requested information on whether the Coastguard would be assigned PRA status as opposed to remaining an auxiliary service. Mr Sean Hogan (Director of Fire and Emergency and a key member of the 2006 Framework group) responded by explaining that the Coastguard were not assigned PRA status as they function offshore and that the Framework covers events that occur on land and within the Irish state. However, the discussion led to the potential to change their position going forward. After this conference, the same discussion arose during one of my interviews with the participant explaining it as such:

“Likewise, with the coast guard or the river here, there has been two decades of war with the Irish Coast Guard, they regard the coast guard as a bunch of enthusiastic amateurs and whatever. It is an arrogance born or whatever and it is a real cultural piece.” (Emergency Management Representative).

It is difficult to discuss this more deeply due to not gaining access to the Coastguard (discussed in Chapter 3), but the idea to exclude the only agency with full capabilities for dealing with coastal emergencies seems problematic. Although AGS have some water capabilities, they are not as advanced or distributed geographically as the Coastguard, meaning that the rescuing of people at sea will primarily always be a Coastguard call. However, the thought process back in

2005/2006, as explained at the MEM Conference, offers some insights into power dynamics and territorial protection that emanates throughout the Framework. The Framework was about land emergencies as off-coast emergencies were rare. So, if it were to happen the Coastguard would still respond, just under the lead of another agency which, due to the perceived amateurish skills of the Coastguard was deemed appropriate as evident by the above quote.

Although, the rationale behind the decision can be explained, it still does not accurately reflect a cohesive coordinated emergency management system when the only agency with a specific set of skills is excluded from a leadership and decision-making role. As the revision of the Framework has been postponed it is difficult to say whether the role of the Coastguard will be upgraded or not.

However, for any major events that happen at a local or agency scale, there are a series of procedures. The Framework cites eight "major elements of response" (MEM, 2006:51). These include "declaration of a major emergency, mobilisation of resources, command, control and co-ordination of response, information management systems, management of the site of emergency, casualty management, protecting exposed populations and public information." All of these elements come together to create an efficient response. The following section will look at command, control and co-ordination with information management systems explored in later chapters.

#### 4.4.1 Command, Control and Co-Ordination

The Framework uses the terms command, control and co-ordination<sup>10</sup> as a linguistic tool in which they can represent the hierarchy and networks of power that create and sustain the IEMA assemblage (MEM, 2006). The Framework protects itself by acknowledging that the terms may be used in different ways at different times but that within the Framework they are set and defined as the following:

- **“Command** – meaning the process of directing the operations of all or part of a particular service (or group of services), by giving direct orders;

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<sup>10</sup> Throughout this thesis coordination is spelled in line with US policy but spelled “co-ordination” if used in a direct quote from Irish policy.

- **Control** – meaning the process of influencing the activity of a service or group of services, by setting tasks, objectives or targets, but without the authority to give direct orders;
- **Co-ordinate** - meaning to bring the different elements of a complex activity or organisation into an efficient relationship through a negotiated process. In an emergency context, this may include the mandate/authority to make certain decisions in pre-defined areas, where a normal consensual approach does not appear to meet the needs of an emergency situation;
- **Co-operate** - meaning to work together towards the same end;
- **Collaborate** – meaning to work jointly on an activity.” (MEM, 2006; 53)

These definitions ensure the creation of a hierarchy of networks but negate to develop upon or account for the more informal relationships which are decentralised and flat and also helps to inform practices of co-ordination, co-operation and collaboration and ensure more respect to the positions of command and control.

The command structure and organisation of co-ordination centres is broad and complicated. Beginning at the PRA scale, each should have a "Controller of Operations" (COO) (MEM, 2006:54) at the event site. Initially, the lead officer and first on scene takes the role of COO until the pre-selected personnel arrives. The COO has an important role in decision-making, ensuring coordination, communications and the organisation of resources, logs and activating the information management systems.

If there is a jurisdictional issue around an event (for instance, it borders a number of AGS divisions) multiple units may respond. In this situation, it should be internally decided who will be the COO for that PRA taking account of the situation, skill and appropriate level. If an event occurs on the boundary of a Local Authority the COO is derived from the Local Authority whose "rostered senior officer was first to attend" (MEM, 2006:55). The COO of the lead agency will be the on-site coordinator. These jurisdictional issues raise concerns around the effective governance of emergencies as each PRA have their own functioning regions which overlap with the regional divisions as outlined in the Framework. For example, each county has their own Local Authority with Dublin and Cork, for instance, having

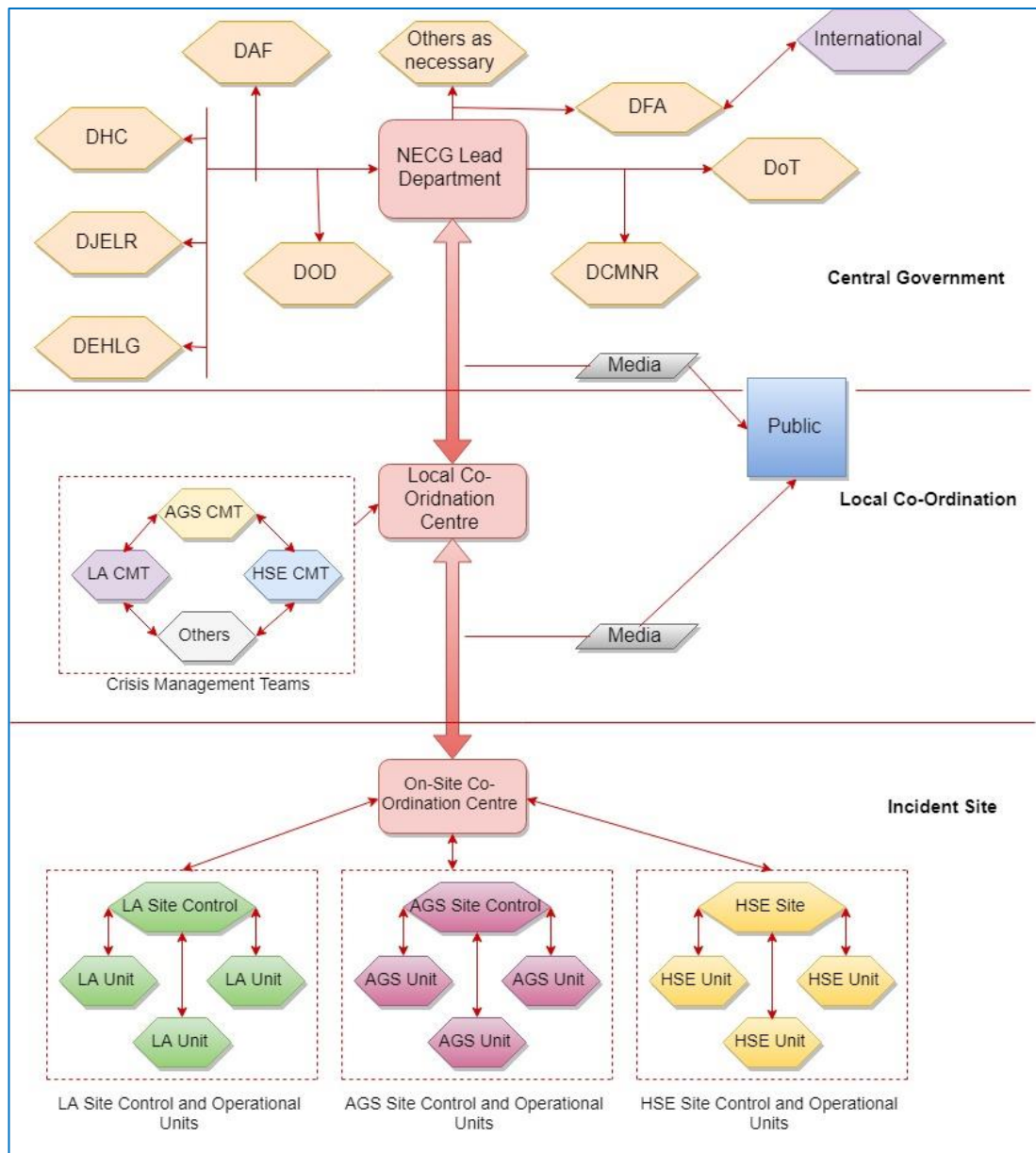
more than one. Then AGS have 6 regions (An Garda Síochána, 2018) and the HSE has 92 ambulance bases and 9 community health regions (HSE, 2018). Thus, regions of governance are mis-aligned making inter-agency coordination difficult as each agency is working within different scales and geographies.

However, there is a suggestion within the Framework that inter-agency coordination should be developed during everyday emergencies so that when a big event occurs the procedures, hierarchies, culture, processes and methods are already trialled and practised, but these emergencies are usually localised and small. Thus, there are few chances to assess how the jurisdictional governance issues may play out during a major emergency. For the facilitation of inter-agency coordination and the management of a major emergency the coordination centres have very specific and important functions such as communication, meeting and refreshment spaces. Any issues that arise during the activation of the Framework will be dealt with by the lead coordinator at a coordination centre. Coordination centres can be remote, as in specially developed coordination centre trucks, or in dedicated centres, such as the National Coordination Centre or in pre-assigned hotels or offices.

There are several types of Coordination centres: On-Site Coordination, Local Coordination (Off-Site), Crisis Management Teams (CMT) and national (Figure 4.3). Figure 4.3 details which agencies are expected to be represented at each centre. However, it refers to local and national incidents and negates to recognise the regional scale, which is a consistent issue throughout the policy. However, the Framework does explain that if a local event is escalated up to a regional event that the “chair of the local co-ordination group can declare a regional emergency” (MEM, 2006: 62) where it is essential that a Regional Coordination Centre is opened. Depending on the situation this escalation can result in the closure of the Local Coordination Centre, or the regional and local centres can work in tandem with the local operating in an assistive capacity. The lead agency from the declared local event, who escalated it up will also be lead agency at the regional scale.



Figure 4.3: Command, Control and Co-ordination Levels and Information Flows



Source: Delaney (2018) sourced from the Framework for Major Emergency Management (MEM, 2006: 57)<sup>11</sup>

Although there is a lead agency, each PRA or auxiliary service still retains power, control and command over their own resources and operations. This is

<sup>11</sup> Figure 4.3 acronyms - DCMNR: Department of Communications, Marine and Natural Resources; DFA: Department of Foreign Affairs and Trade; DoD: Department of Defence; DEHLG: Department of Heritage and Local Government (please note this is now known as Department of Heritage, Planning, and Local Government); DJELR: Department of Justice, Equality and Law Reform now known as the Department of Justice and Equality; DHC: Department of Health and Children, DAF: exact definition unknown but it is now referred to as the Department of Agriculture; AGS: An Garda Síochána; LA: Local Authority; HSE: Health Service Executive and CMT: Crisis Management Team.

important to note in relation to how assemblage theory is understood. The Framework supports Deleuze and Guattari's idea that assemblages are fluid and borderless so that the coding practice creates efficient organisation but does not overpower the assemblage allowing for deterritorialization and reterritorialization to occur if and when necessary. These can occur because the Framework is an unlegislated policy document which encourages all agencies to create their own individual plans but determines that there is a hierarchy and networks of power when responding to a major event. It also ensures that each agency retains full operational power and control over their own resources and can oscillate within the assemblage both horizontally and vertically when required.

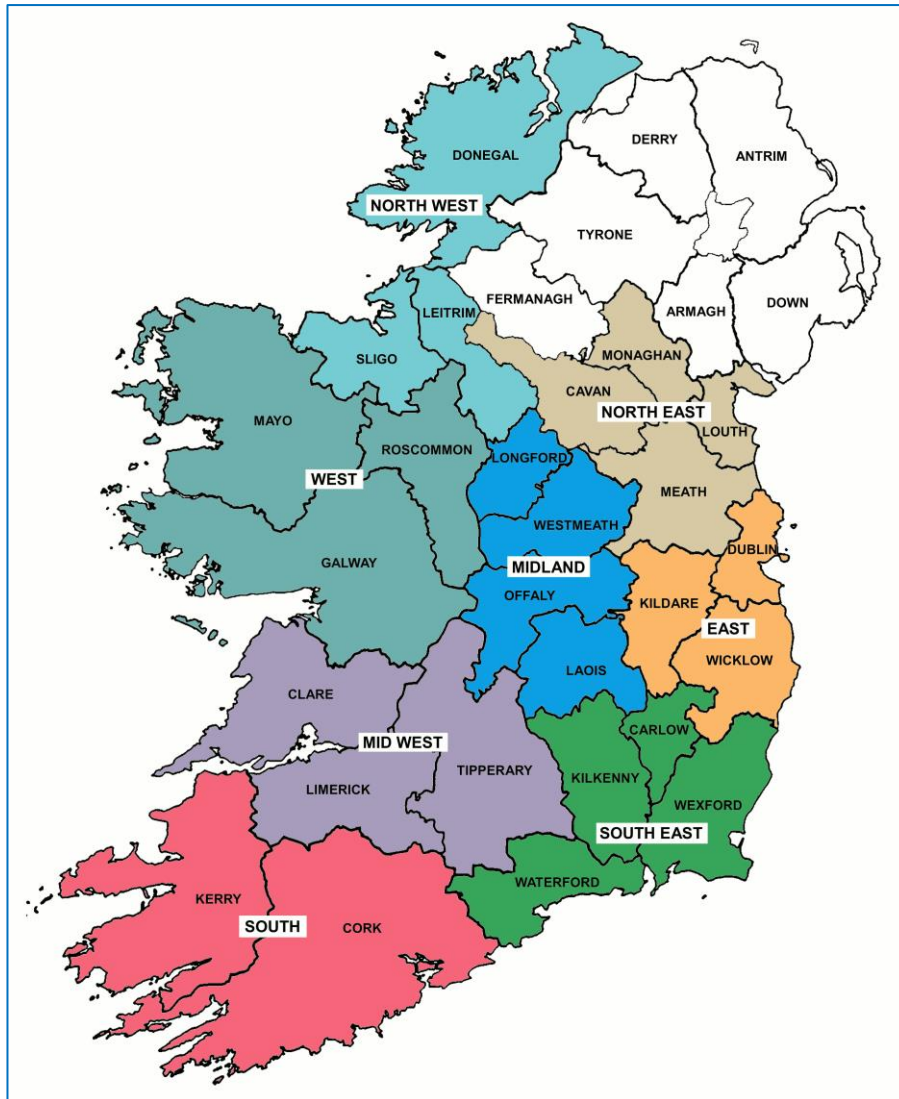
#### 4.5 IEMA - Regional Scale

The next scale is the regional scale which is relatively underdeveloped in policy terms. For instance, the Framework only briefly touches on it as many of the procedures are the same as the local but cover a wider geographical space. The Republic of Ireland is split into eight pre-determined regions for the management of regional scale events (see Figure 4.4). A local event may be escalated up to the regional scale by the lead local co-ordinator if any of the following criteria are met: resource availability, "consequences" for the localities, crosses jurisdictional boundaries of either a "Local Authority or AGS", or where several PRA's converge (MEM, 2006:62). However, the main intention of the regional scale as suggested by the choice of language and sentence structure in the below quote is to ensure coordination across jurisdictional boundaries and minimise conflict between different local authorities and agencies which is difficult due to varying scales of governance

"[...] the Framework requires that the principal response agencies, within defined regions, should work together to coordinate the inter-agency aspects of major emergency preparedness and management" (MEM, 2006: 35).

The regional scale in organisation is more politically and policy-driven than the local scale and has some similar groups as at the national scale. These groups at both scales are all striving towards similar goals cross-cut with the same people.

Figure 4.4: Map of Major Emergency Management Regions



Source: MEM (2018)

#### 4.5.1 Regional Steering Group

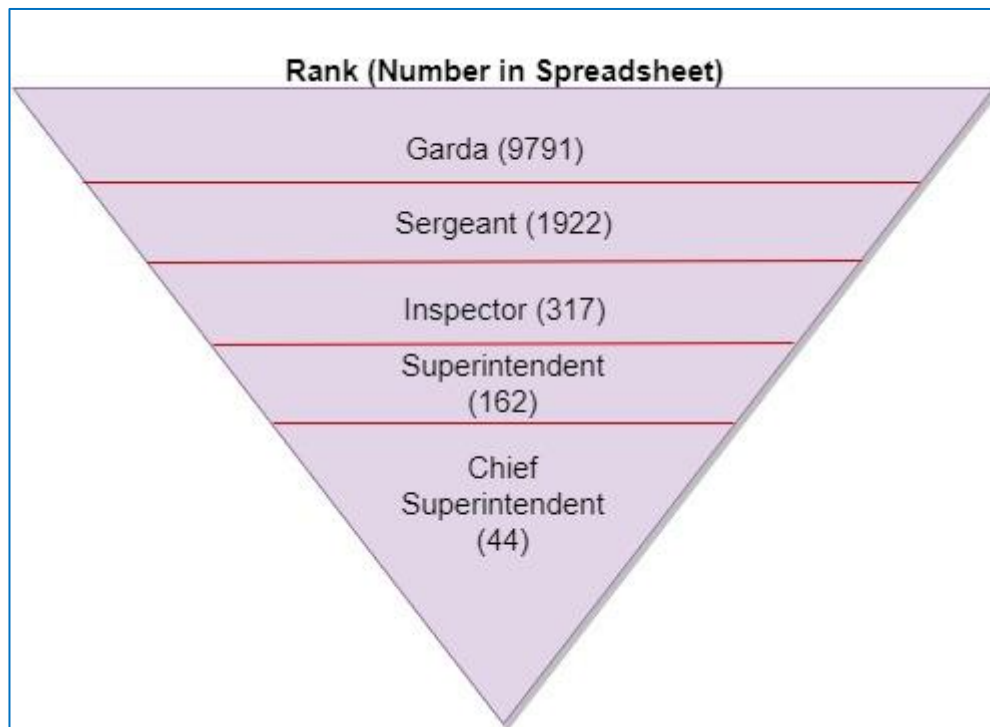
It is suggested within the Framework that the development of a Regional Steering Group is “in keeping with current practice” (MEM, 2006: 35) and is comprised of senior staff from the PRAs. The Principal Response agencies, as dictated in the Framework, are Local Authorities, AGS and HSE. The main role and responsibilities of the Regional Steering Group is to ensure that the objectives of the Framework are delivered and implemented across the eight regions, to create an “annual budget for [...] regional preparedness” (MEM, 2006: 35), ensure a “development programme” is created for regional level response, “risk assessments” are conducted (MEM, 2006:35) that processes of mitigation at the regional scale are completed, regional level co-ordination and centres are developed, and that each

PRA's plans are analysed and accepted. From this develops the Regional Working Group. To ensure inter-agency coordination the chair of the group, changes every year, to one of the PRA's.

#### 4.5.2 Regional Working Group

The main aim of this group is to support the implementation of major emergency management development at the regional scale. This is a very similar aim to that of the Regional Steering Group however, it is made up of "key personnel in the principal response agencies" with the chair reporting to the steering group (MEM, 2006:36). The language used to support the need for two groups is interesting. "Senior officials" (MEM, 2006:35) and "key personnel" (MEM, 2006: 36) are very similar. The working group is not comprised of operational staff, rather both groups are comprised of personnel of higher ranks with perhaps the difference being that the staff in the regional working group may still have a few operational tasks. This became clear through my interviews with AGS. One of the participants has the rank of Inspector and sits on a Regional Working Group. Inspector is the 3rd rank from the bottom but based on the numbers employed in that position in 2015 in comparison to those both above and below it, it can be deemed that rank of Inspector is still very much a senior official (see Figure 4.5). Thus, the use of different terms of those working in each group may appear to provide a differentiation between the two groups, but it is staff from similar levels of authority occupying these spaces meaning that the knowledge shared is similar and does not account for lower ranking officers.

Figure 4.5: Rank and number of Garda in 2015



Source: Horgan (2016)

The Framework lacks depth in its exploration of the regional scale, so much so, that after just a few short paragraphs the discussion returns to the roles of both the working and steering group. The lack of explanation of the regional scale in the Framework, and the minimum discussion that occurred about it during interviews, suggests that it is a bureaucratic middle layer which is rarely activated. Basically, it maps onto no agency in terms of geography especially since there is a lack of regional government in Ireland. However, in terms of interagency coordination, it is an important element for the facilitation of training and for the development of both formal and informal networks.

#### 4.6 IEMA - National Scale

The national scale is not informed by the Framework, but from different policy documents. Between 1984 and 2004, national emergency management was organised via a ‘Task Force for Emergency Planning’ and an ‘Inter-Departmental Working Group on Emergency Planning’ (MEM, 2006 and O’Riordan, 1992). In 2004, these bodies implemented the ‘Strategic Emergency Planning Guidance’ policy. The main aim of this policy was to create effective

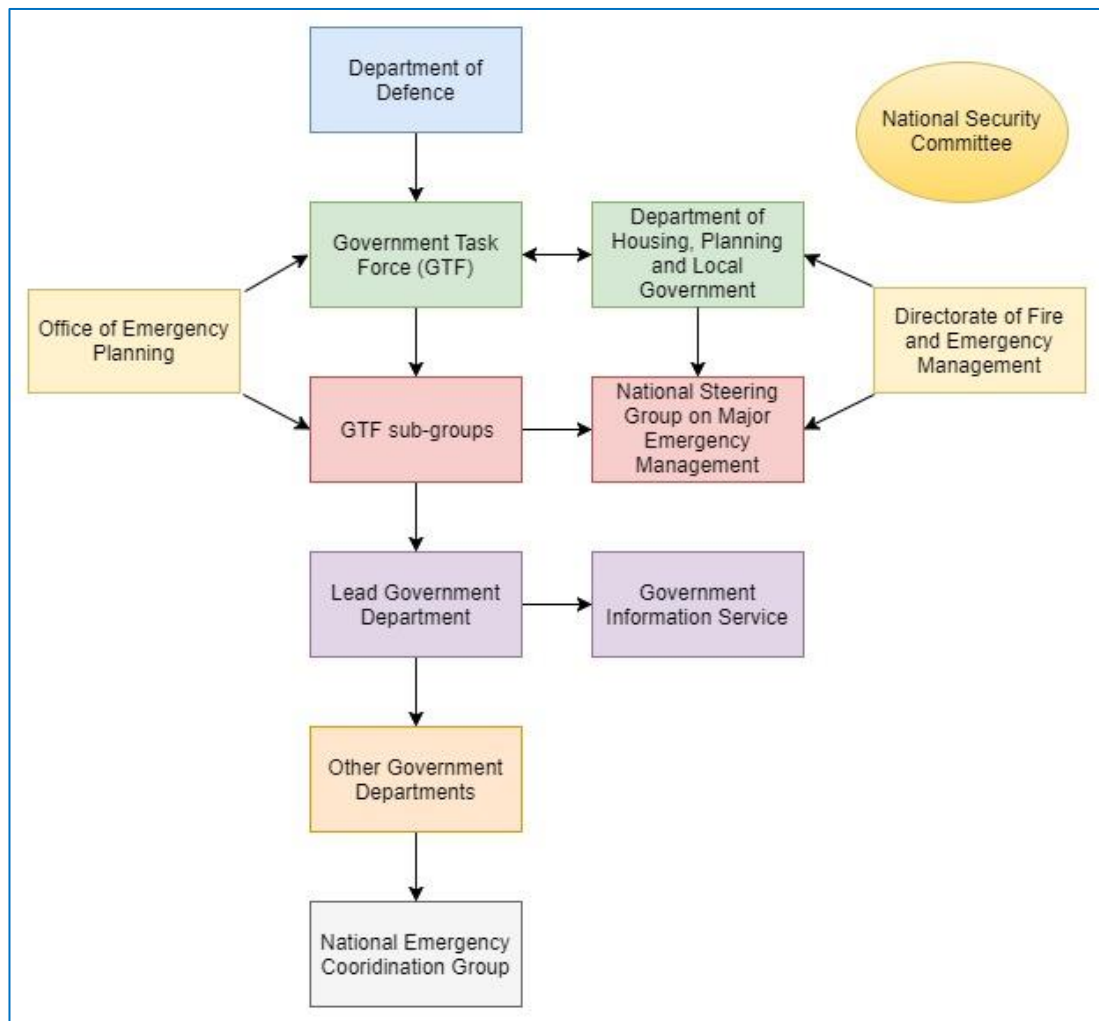
emergency planning between the government and public agencies. The policy was noted by a participant as an iconic document which outlined the governance of emergency management from the national scale. However, in December 2017, the ‘Strategic Emergency Management National Structure and Framework (SEMNSF, 2017) was released by the Office of Emergency Planning to replace the 2004 policy.

The Office of Emergency Planning (OEP) reports to the Minister for Defence and is responsible for the “coordination and oversight of emergency planning” in Ireland (European Commission, 2017). Upon a close reading of the document it speculatively appears as an updated version of the 2004 policy, although it is not referred to as such. Even so, I chose to use this policy instead of the 2004 policy for two reasons. Firstly, it speaks to a foreseeable technologically-mediated future with changing methods of governance based upon algorithms and anticipation in a way that the 2004 policy could not envision. Secondly, it is clearer in its explanation of the organisation of emergency management in Ireland.

#### 4.6.1 Overview of the National IEMA Structure

Figure 4.6 illustrates the verticality of the IEMA assemblage at the national scale, while also recognising aspects can be vertical and horizontal depending on the situation and the agencies involved. Although hierarchy is clear at this level, there is a symbiotic characteristic to this part of the assemblage. If one agency fails in their remit or does not coordinate with the other effectively, all elements both up and down the hierarchy are affected. By discussing each group separately, the blurring of scales within and between agencies and the power of the national versus local scale becomes clearer. All information was analysed from SEMNSF (2017) unless otherwise noted.

Figure 4.6: IEMA National scale organisation



Source: adapted from information available in the SEMNSF (2017)

#### 4.6.2 Department of Defence

The Department of Defence is interesting because at the ministerial level it is at the top of the hierarchy with only the Taoiseach's Office<sup>12</sup> preceding it in some cases. The Minister for Defence is the chief of the 'Government Taskforce on Emergency Management' (herein referred to as GTF). The highest specific emergency management entity. However, the displacement of the Defence Forces as one moves down the hierarchy creates an interesting observation on the network of power that systematically controls and shape the IEMA.

<sup>12</sup> An Taoiseach's Office is missing from the diagram because it does not have a role in decision making beyond being the national figurehead as stated in Chapter 2, Taoiseach Varadkar would be Agamben's prime example of a sovereign leader.

As discussed in the local/agency section, the Defence Forces are an auxiliary service at the local scale and must be invited in by the lead agency or department. However, in a contradictory and ironic fashion, this invite usually goes through the Department of Defence.

“So, if for instance any of these agencies [participant is referring to the PRA's] request assistance from the Defence Forces they will contact firstly the Department of Defence and if they need something immediately, if it was a severe weather crisis and they needed assistance immediately, the local authorities for instance would get in touch with the barracks that is closest to them. So, for instance, if there is a crisis in Kilkenny City, for example, the local authorities would contact Stephen's Barracks located in Kilkenny.”  
(Participant ID22)

This loss of power for the Defence Forces as they move down the scale from national to local and from department to operational is a clear example of disconnection between policy and mechanisms of governance and is evidence of power stripping. This illustrates a messy power dynamic between the Department of Defence and the Defence Forces as it is clear that the Department of Defence have a major role at the national scale and are influential within the OEP while also having operational staff working within the office. There is no obvious explanation for this messy and obvious under-appreciation of the Defence Forces and yet, historically, Ireland's emergency management system continually requests their involvement during major emergencies.

#### 4.6.3 Government Task Force and the Sub-Groups

This consists of all government departments, HSE, AGS, Defence Forces, as well as other state authorities such as the Office of Public Works (OPW) and the Revenue Commissioners (SEMNSF, 2017). The key role and responsibilities of this force include, but are not limited to:

- Coordinating emergency management policy;
- The “political leadership” (P. 6) for the IEMA assemblage as a whole;
- Coordination across and down the assemblage;



- A space for government departments as well as agencies to share knowledge and best practices across and down the assemblage;
- Specific sub-groups to deal with particular aspects of emergency management.

The sub-groups consist of government departments, agencies, non-governmental organisations, and private consultants or actors. Each sub-group is assigned a specific aspect or issue within emergency management that needs to be evaluated. An example of a sub-group is the National Steering Group on Major Emergency Management.

#### 4.6.4 The Department of Housing, Planning and Local Government

The positioning of this department is contested. Some suggest that it should be aligned with the Department of Defence and others view it is a lead government department (LGD) and thus, like the Departments of Health and Justice and Equality its positioning is lower down the hierarchy. Based on the SEMNSF, I have positioned it at the same level as the GTF as it is the home of the Directorate of Fire and Emergency Management which chairs the National Steering Group. However, this is another complex element of the assemblage because the Department of Housing, Planning and Local Government (DoHPLG) is the lead government department which governs the local authorities who then subsequently govern the fire service.

#### 4.6.5 The Directorate of Fire and Emergency

This was set up in 2009 to primarily support the fire service but its remit extends into the preparation, mitigation and management of major emergencies such as flooding in a coordinated manner with local authorities and government departments. As a result, the Directorate under the guise of the DoHPLG, chair the National Steering Group.

#### 4.6.6 The National Steering Group on Major Emergency Management

This sub-group has authority over specific research regarding Irish Emergency Management as a whole. It facilitates the implementation, management and revision of the Framework for Major Emergency Management and feeds back up to the Inter-Departmental Working Group on Major Emergencies which is part of the Government Task Force.

#### 4.6.7 Lead and other Government Departments and Government Information Service

The 2004 Strategic Emergency Planning Guidance outlined the importance of assigning lead government departments and agencies. This has been continually re-iterated through policy and is a key anchor of the all-hazards approach. The LGD is assigned certain emergencies prior to an event occurring and the lead agency usually corresponds to the LGD. For instance, the Department of Health is the LGD for the HSE who manages the National Ambulance Service. The LGDs main role is to coordinate a national response. For instance, in the case of the Aussie Flu during Winter 2018, the Department of Health led the national campaign with the HSE acting as the mediator between government departments and General Practitioner services, hospitals and patients. Further, the LGD is responsible for “risk assessments, planning and preparedness, prevention, mitigation, response and recovery” (SEMNSF, 2017; 6).

All Government Departments have a support function during emergencies. They can be called upon by the LGD to facilitate actions, provide personnel or resources or support functions. Further, they can be escalated up to the LGD as the event changes and requires different types of expertise. Further, the Government Information Service is linked with the LGD to ensure the maintenance and function of communications systems during an emergency.

#### 4.6.8 Office of Emergency Planning and the National Emergency Coordination Group

The OEP is managed by the Department of Defence and supports the chair of the GTF. It has several functions:

- It manages and operates the National Emergency Coordination Centre (NECC);
- Provides support in “identifying capability gaps and informing capability development” (SEMNSF, 2017; 7);
- It is a focal point for emergency management in Ireland;
- It has the capabilities to provide training, education and advice to any government department or agency;

- “The OEP has the objective of improving and coordinating emergency planning and bringing the necessary cohesion to the emergency management-related work of the various Departments and Agencies.” (SEMNSF, 2017; 7);
- It also prepares the National Risk Assessment for Ireland (NRAI) with government departments following European Union (EU) guidelines. The NRAI "evaluates the natural, technological, civil and transportation risks" (SEMNSF, 2017; 7) that may face Ireland. It also ensures that our emergency management protocols comply with EU mandates regarding risk management.

The National Emergency Coordination Group (NECG) is activated during a national event by the Office of Emergency Planning (OEP). During the first meeting, all members of the GTF are required to attend but thereafter, they only need to be present if it is deemed necessary. Sub-groups may develop from this to deal with specific aspects of the event.

#### 4.6.9 National Security Committee

This is discussed in SEMNSF (2017) but does not seamlessly fit within the structure of the IEMA at the national scale. Thus, as in Figure 4.6, it is situated near the top of the hierarchy, but it is a stand-alone group. It is chaired by the Secretary-General of the Government and includes senior officials of the Department of Taoiseach, Justice and Equality, Foreign Affairs and Trade, Defence Forces and AGS. The reason for its stand-alone nature is that it is specifically concerned with security and involves the most senior of officials in Ireland. It is mobilised as a resource for emergencies if there is a security element. The next section will explore that national scale in terms of its power structures, position in the assemblage and relationship with the lower scales of the IEMA.

#### 4.7 Politics, Power and Position

The role of politics, the effects of power and the position of agencies (i.e. PRA or auxiliary) within the IEMA can be identified and examined via the Framework and SEMSNF by questioning what is missing, who was involved, and language choices. These five assessments offer critical insights into how the policy informs the shape of the assemblage, leaves space for the assemblage to oscillate and contributes to inter-agency tensions making coordination more difficult.

Firstly, at the national scale, emergency representatives meet government officials. It is at this scale that we can trace back to a sovereign authority that has the power to act on the IEMA assemblage. There is a very clear sovereign power in the Taoiseach, but even he is informed by Department of Defence who have the skill set required to gather, analyse and disseminate information. Thus, in times of major emergency, the Taoiseach is a figurehead, a person to whom the public can turn to, respond to, and debate with. The Taoiseach's Office is a public sovereign in times of distress, but it is the Minister for Defence who makes the final decision or at least informs the Taoiseach of possible decisions regarding a situation. Thus, the highest powers are clear and important in the case of any national major emergencies. At present, there have only been a handful of major emergencies none of which could be classed as national.<sup>13</sup> The true number is debated with key participants being unsure of what has been classed as a major emergency, what has invoked the activation of policy such as the Framework for Major Emergencies. As of yet, there have been major emergencies that are localised which require national input but rely mainly on local resources. There has been no major national spatially broad emergency, but Storm Ophelia was a close contender. The development of Ophelia suggests that Ireland has the potential of having a major weather event which will need a clear and understanding response from all scales of the IEMA assemblage.

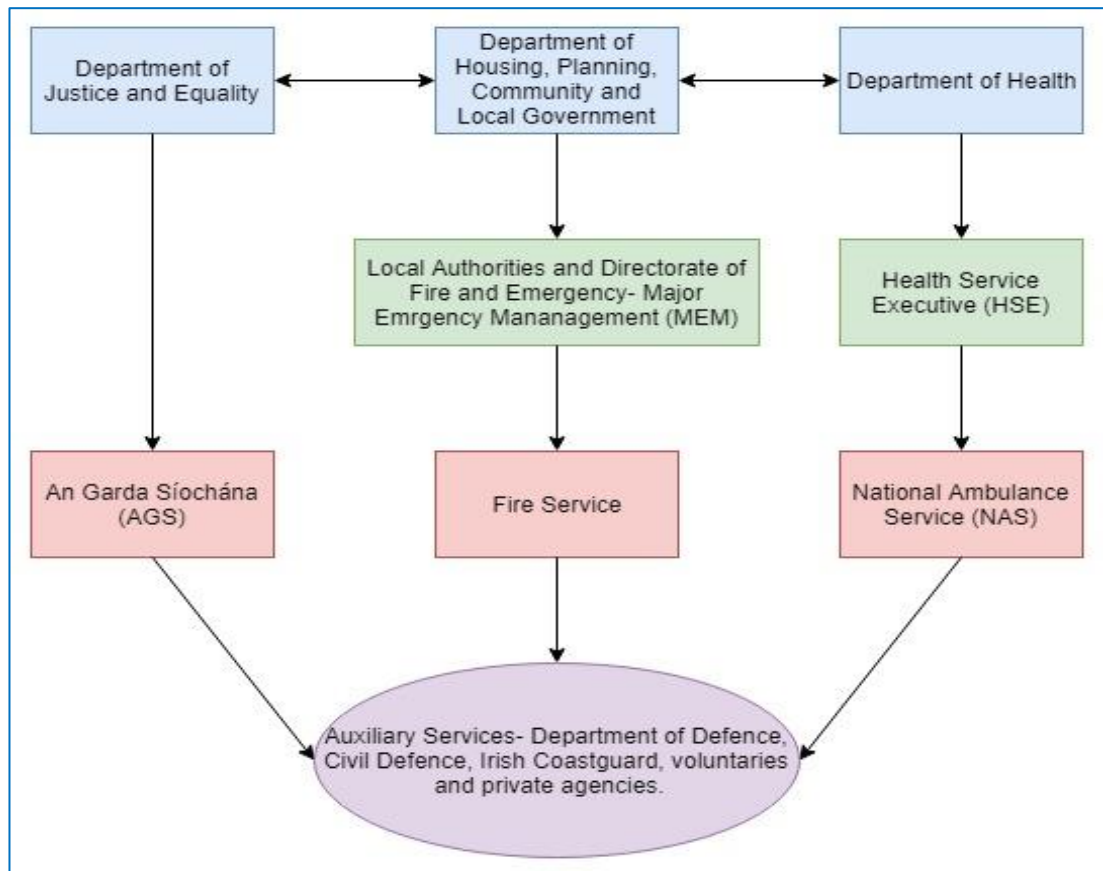
Secondly, the process of decision-making and policy-making that occurs for emergency management in Ireland leans towards the political powers while limiting the agencies inputs. The Framework instils this power division and muting of agencies. Figure 4.7 presents how policy decisions are made and are introduced into the service. It was noted that policy decisions went straight from the Department of Justice to AGS in a “structural manner” (Emergency Services Representative), thus allowing the Garda Commissioner and higher ranks to have more input into the direction of policy. This produces space for the sharing and acknowledgment of particular knowledges to be included in policy. For instance, the experiences of operational staff provide unique insights into the effectiveness of different response protocols. However, by creating conversations between the

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<sup>13</sup> Hurricane Ophelia and the Beast from the East, although assigned code reds and were national scale events, they were never actually declared a major national emergency. I have not been made privy to the reasons for not declaring them national emergencies.

operational and senior staff and the Department of Justice (DoJ), decision making, and policy formulation becomes a process created by the embodied sovereign authority, i.e. the DoJ, but influenced and dispersed by AGS. Further, as the policy moves from the DoJ directly to the agency that implements and acts upon the policy, there is a clearer understanding of it and a quicker sharing of information down through the ranks. Alternatively, the Fire Service and the National Ambulance Service are under middle agencies that “are bureaucracies who were never on the ground” (Emergency Services Representative). Policy directives and the decision-making process remains firmly at the central government level, a true overt and powerful sovereign who dictates policy towards the middle agencies, who then direct the Fire Service and Ambulance Service. Thus, there is a “splintering effect within agencies which has an impact on major emergencies” (Emergency Services Representative). Simply, policy is written by policymakers who have never been in the service or worked on the ground, so the policy does not always accurately reflect the reality of the service and its mandates. This was illustrated by the fire service: “I suppose there is a weakness there on the clarity of the mandate that the fire service has in flooding.”

Figure 4.7: Hierarchy of emergency management decision-making and policy creation



Source: Adapted from a participant's rough sketch.

Thirdly, as described, Irish emergency protocol has historically been written after an event. The Framework attempts to create pre-emptive planning, however, it does so without actually making any of the key agencies change how they approach different crises due to it being unlegislated. This resists rocking the 'proverbial boat' by legislating a Framework that could provide a more stable and coordinated response system through formalised inter-agency relations and the breaking down of the antecedent silos. Examples include silo driven government departments, which are a key barrier to the development of a CMaERA in Ireland. This is evident during the early years of emergency planning between the Department of Health and the Department of the Environment (O'Riordan, 1992 and McMullan, 2010) as discussed. However, the problem still prevails today, with the Civil Defence frustrated with agencies rarely coordinating with each other.

“One of the issues I think that you should look at in your conclusion, one of the problems with the MEM is it is under the Department of Environment [it is now under the Department of Housing, Planning, Community and Local Government] and they don't talk to us.”

While, a key emergency management policy writer recognised that the silo shape of the IEMA restricts information flow and that the effective organisation and use of resources is weakened due to each agency wanting independency. While another representative suggests that the reluctance to de-silo comes from an innate will to be “in charge”.

“I suppose looking generally at the government departments and you used the term silo there a while ago, if your parent agency or your parent boss is your government department you see issues of this, and they are across in the papers that they have issues of knowing what the other government department are doing. So, if that is at the very top it is very difficult to drip feed down to the bottom of sharing that type of information. [...] So, I think there will always be siloes until we break out, until you have the three agencies responding, and I suppose the perfect example of the silo is one of the deficits in Ireland is the three control centres should be in one building” (Participant ID31).

“The culture there is we own, we are, coordination isn't a word that they would be familiar with. In charge is the word they use; they are in charge. And I say this about my own service, I have great difficulty with this about our own service” (Participant ID26).

Interestingly, within these silo agencies it is expected that media representatives will work together to ensure that the same information is shared from each agency to the general public but as identified by participant ID19 this does not occur.

“Again, you had the three response agencies got into a room with each of their spokespersons for the press conference and they were very, very siloed. They talked about this particular Q&A list, about what was happening in their area. What they forgot to do in all of that was, the media liaison officers

that is, was to liaise with the other media liaison officers in the other two agencies to make sure that nothing they were saying was going to undermine or cast a bad light on what the other two agencies were doing”.

So, it is recognised by a range of participants that the silo institutional form of the IEMA still exists and is problematic but is there a way of breaking down these barriers and overcoming these issues? This idea will be explored in Chapter 7 but for now Participant ID32 is working carefully in Cork to try and do just this as he argues that

“It doesn't happen overnight; you have to work. But what happens to break down those silos and barriers between the different agencies and change the culture of the organisations is the training and working together. We do the centre agency training and that is when the different agencies come together and train and get to know each other and that is very beneficial”.

Fourthly, the writing of the Framework was geographically exclusive as the members of the Review Working Group, who revised the 1984 Framework, consisted of the Department of Environment, Heritage and Local Government as it was then known, the HSE, AGS, Limerick County Council, South Tipperary County Council, and Cork County Council (MEM, 2006). This group had no representation for a number of agencies, nor did the representatives speak for a range of regions in Ireland including cities.

Comfort and Kapucu (2006) propose that urban areas have specific issues due to the complex, multi-faceted systems that create and sustain cities. Thus, emergency management protocol should reflect the complexity of urban areas. Therefore, the Framework’s standardisation of protocol does not reflect that the Emergency Management System in cities are responding in a much more diverse area, have many more actors and systems to deal with, but also may have more resources than rural areas. Further, as the Framework promotes inter-agency coordination, but only confers with certain agencies and regions, it ignores aspects of services such as the number of employees. In small towns, such as in the areas represented by the councils in the working group, it is easier to form more stable formal relations between agencies reducing tensions between them because the number employed is less than in cities with multiple stations and thousands of first



responders. Therefore, cities find it harder to form formal relationships between agency staff, resulting in increased tensions as there are no strong inter-agency working relationships.

“I would think... I have worked in three parts for the ambulance service, I have worked in the West, Dublin North Leinster and the South, those three different areas so you would notice where there is relationships built up. There is a better inter relationship dynamic there in the west where maybe there isn't a lot of change of personnel but because of the hours there is a lot of change of personnel, so it doesn't have that same community relationships.” [This was a difficult quote to hear, my notes suggest he was referring to Dublin for the latter half. (Participant ID16) (Adapted and edited from the personal experience of a first responder).

When this issue was raised with one of the writers of the Framework their answer was political in the sense that, they recognised the issue but were also able to adequately defend it. They also accepted that not all were happy with the consultation process.

“That is a fair question, looking at the people who are involved in it. You are talking about the working group and the steering group and whoever might have been involved. Different people have been mandated by virtue of the position that they held but there was a huge consultation exercise went on as part of that so every organisation that was referenced there, particularly the voluntary sector at the time, I recall a huge effort went into the consultation process with them. [...] What we did... You met groups of people everywhere and we had had a lot of experience before that and we listened to what we heard. In fact, I would counter your point, this is a very interesting point you raised though, I would say that there was a number of things that really influenced us in writing up that document. One was the progress being made in the south region, they had set themselves up as a region, the old health board region, and they were well advanced. So, in effect what the Framework did was take a lot of the good ideas that were out there and brought them forward. There was a second piece that came from the Midland health board area [...]. There was a lot of things happening in the Midland health board

region, there was a midland major emergency group and a lot of the ideas that are in the Framework, in fact, emerged from work that was done down there. So, while I might have been the vehicle and this pen might have been the vehicle to actually convert it into paper, I would argue very strongly in fact that it was capturing what had gone on out there in terms of good stuff, in terms of good practice. And the driver for it at the time was the old 1984 Framework which had been in place. If you went to stuff, and I did go, I went to exercises and things outside, people didn't know of that, hadn't heard of it, so this was part of a big campaign, I attended exercises where people were reinventing wheels. They had no idea that there was a Framework within which they should have been operating, so it was within that context the piece was written. So, for your geographic perspective, now it is an interesting point, I had never viewed it like that. Not everyone was happy with all the consultation piece within it but that happens.”

The process undertaken for the formation of the new Framework resulted in the emerging consequences of institutionalisation as each agency had their own idea as to how the Framework should be written and operationalised, which suited or prioritised their own agency culture. This inter-agency conflict merged with the obvious geographical exclusions created a policy document which remained unlegislated but the cornerstone of emergency management in Ireland. This decision to paint over inter-agency conflict rather than refer to it in the policy or provide a means for compromise ensures that each agency can internalise and use the Framework as they see fit following Agamben’s idea of sovereign control through providential will. This proves problematic when the IEMA is activated and each agency uses or does not use the Framework in different ways.

Finally, in Chapter 1, there is a limited overview of language choices that I now wish to deepen with regard to their usage in an actual policy document as it provides key insights into some of the practices and processes of the IEMA which, at times, contribute to the re-shaping of the IEMA. Choosing to use the term ‘emergency’ is somewhat political in that it encourages the emergency services to use it as they can identify with it. The use of emergency makes a connection with their name, intentions and services. Further, the term emergency is simultaneously a term of crisis and hope, a vehicle for action and change and a

mechanism of governing and response. It is often a catalyst in our evolution towards resiliency which is a key concept in the Framework which also pushes for re-evaluation of events to ensure issues are continually solved and positive initiatives are built upon, event after event. Thus, choosing to use emergency is attractive to the key agencies but it is one that allows space for learning, rebuilding, retraining and resilience and capacity building. However, choosing to use the term ‘major’ signifies that the Framework is for those rare events that could be akin to a crisis or disaster. The Framework defines a major emergency as

“any event which, usually with little or no warning, causes or threatens death or injury, serious disruption of essential services or damage to property, the environment or infrastructure beyond the normal capabilities of the principal emergency services in the area in which the event occurs, and requires the activation of specific additional procedures and the mobilisation of additional resources to ensure an effective, co-ordinated response” (MEM, 2006:15)

By adding the term ‘major’ to ‘emergency’ the event is associated with often deadlier crises or disasters in comparison to normal emergencies which occur daily and are disruptive but manageable. However, the term crisis is used within the Framework in reference to a particular group of teams called the Crisis Management Teams which are a “strategic level management group” located in each PRA and run by the senior team. The main intention of this group is to provide assistance to their “PRA representative at the Local Co-ordination Group, their COO on site and maintain the agency’s normal day-to-day services” (MEM, 2006; 62). Thus, the use of crisis here is used to acknowledge that extra support is needed and that there needs to be a team in place to ensure that the agency remains active outside of the emergency and yet, choosing the term ‘crisis’ and ‘management’ seem misplaced because this team is a support network responding to a major emergency. Thus, there is a lack of consistency within the Framework on what terminology should be used and what they actually mean in terms of Irish Emergency Management.

This proved even more problematic when the term disaster was analysed. Throughout, the entire Framework it was used seven times, once as part of an explanation of a Figure, once as part of the principles of emergency management

and once in a footnote describing the Air India Disaster. However, the other four times within the body of the Framework and in the Minister's preface it is used in connection with the general public.

This is quite revealing with regards to social expectation, the beliefs of the agencies and the power of this group but also the choice to use disaster when discussing the public has specific consequences linguistically. Below are the ways it is used:

- “It is generally acknowledged that the **public** are most receptive to safety messages in the immediate aftermath of a **disaster**” (MEM, 2006:30).
- “In many **emergency** situations, the **public** respond to assist friends, neighbours and even complete strangers when **disaster** strikes” (MEM, 2006:75).
- “It is recognised that **communities** that are empowered to be part of the response to a **disaster**, rather than allowing themselves to be simply victims of it, are more likely to recover and to restore normality quickly, with fewer long-term consequences” (MEM, 2006:75/76)
- “It is through this continuous process and through regularly carrying out exercises to test the plans that we can be sure that we are as prepared as possible to **protect the public should disaster strike**” (MEM, 2006:9).

The key elements of the quotes have been highlighted to explain the power, societal expectations and linguistic consequences. The overarching theme within these quotes is the patronizing tone in respect to the public with undefended terms such as: "it is generally acknowledged that the public are most receptive," or "rather than allowing themselves to be simply victims". It is this tone that stems from the knowledge aspect of power allowing the Framework to be presented as a document for those with experience and presents the public as unsure how to deal with these situations. The language should recognise that communities and citizens are often more aware of these situations than acknowledged and that they can offer local expertise and knowledge that the IEMA agencies do not have.

“It’s going take all the skills that we have got and let’s utilise them for our own community and that is why the community is vital in that”. (Participant ID02)

“Because we acknowledge that just like the support has to be both ways, we need to support community and we need to support agencies, we need to have a partnership because when a flood happens, or a disaster happens, if you already have a partnership in place and you know what your expectations are, and you know your strengths and weaknesses and where we can pull resources. Obviously, a community can be much more prepared in that sense”. (Participant ID1)

Thus, by choosing to use the term ‘disaster’ as opposed to ‘emergency’ there is a suggestion that the IEMA may deem the event an emergency but to the general public, it’s a disaster or at least that is how it will be viewed. The language is forceful and violent, “disaster strike”, and implies fear and abnormality. Further, in media discourses, the words ‘disaster’, ‘emergency’ or ‘crisis’ are rarely used, so there is little reasoning why when discussing the public that the term changes to disaster over emergency except if it is to denote power on the IEMA side and an expectation that the general public are ‘dramatic’ due to misguided understandings of emergencies. Linguistically, this creates a you/them dichotomy with the IEMA being the authority figure and the general public being “docile citizens” to borrow the term from Foucault, (1977/78). This creates two distinct groups, the IEMA with the knowledge and experience while, the general public is perceived to be unknowledgeable and in need of guidance from the IEMA grouping.

Further, language informs and enforces the decision-making process. In the Framework, the language used to illustrate the different decision-making processes is particularly confusing to an outsider or someone unfamiliar with the broader emergency management plans. For instance, the sentence structure and choice of words in the following opening sentence of the decision-making section of the Framework have been chosen carefully, but also inclusively for those with experience and who have certain levels of power, as the terminology insists on a form of shared knowledge between the close-knit top-scale group to be fully understood.

“Mandates, in the context of a major emergency response, establish the envelopes of empowered activity and decision-making to be expected, without references to higher authority.” (MEM, 2006: 59).

Words such as “mandate”, “envelopes” [in this context] and “higher authority” all reveal the thinking of those who developed the Framework and represents the clear structures of power and hierarchy, but also the importance for shared power and a flatter approach during emergencies. For instance, referring to "a higher authority" is almost akin to the theological sense of God. This is supported by Agamben’s theological grounding of how power works in relation to a sovereign authority (Agamben, 1991; 1998; 2003). Thus, by analysing key terms such as “higher authority” it creates the illusion of a sovereign power with ultimate control. Regarding terms like “mandates” and “envelopes”; no clear definition of either is provided in the Framework.

The power of the word ‘mandate’ is interesting as it is a word of power or control. It can be defined as "an official order or commission to do something" (Oxford English Dictionary Online, checked 28/2/18). Thus, using the term mandate is in direct contradiction with the unlegislated nature of the Framework. Although all agencies do use the Framework and do cooperate with the suggested procedures and policy development, it is still just an advisory document rather than an authoritative Framework. By choosing to use a power-charged word such as mandate within this context there is a shift towards control and a re-enforcement of governance procedures. The Framework argues that "the purpose of these mandates is to make explicit the decisions that need to be made at the various levels and to define how decisions are to be arrived at quickly" (MEM, 2006: 59). Thus, there is a sense of urgency within their defence of the use of mandates, but it is also presenting a fear that without these mandates, decision making between agencies would be difficult or contested.

The final word choice of “envelopes” is the key reason for the sentence being confusing and needs dissecting to reach the actual meaning behind it. However, this research suggests that the term “envelope” is actually a very important choice as it suggests a covering or structure that protects something valuable. Thus, using it in this way creates a subtle defence for the use of “mandates”. It suggests

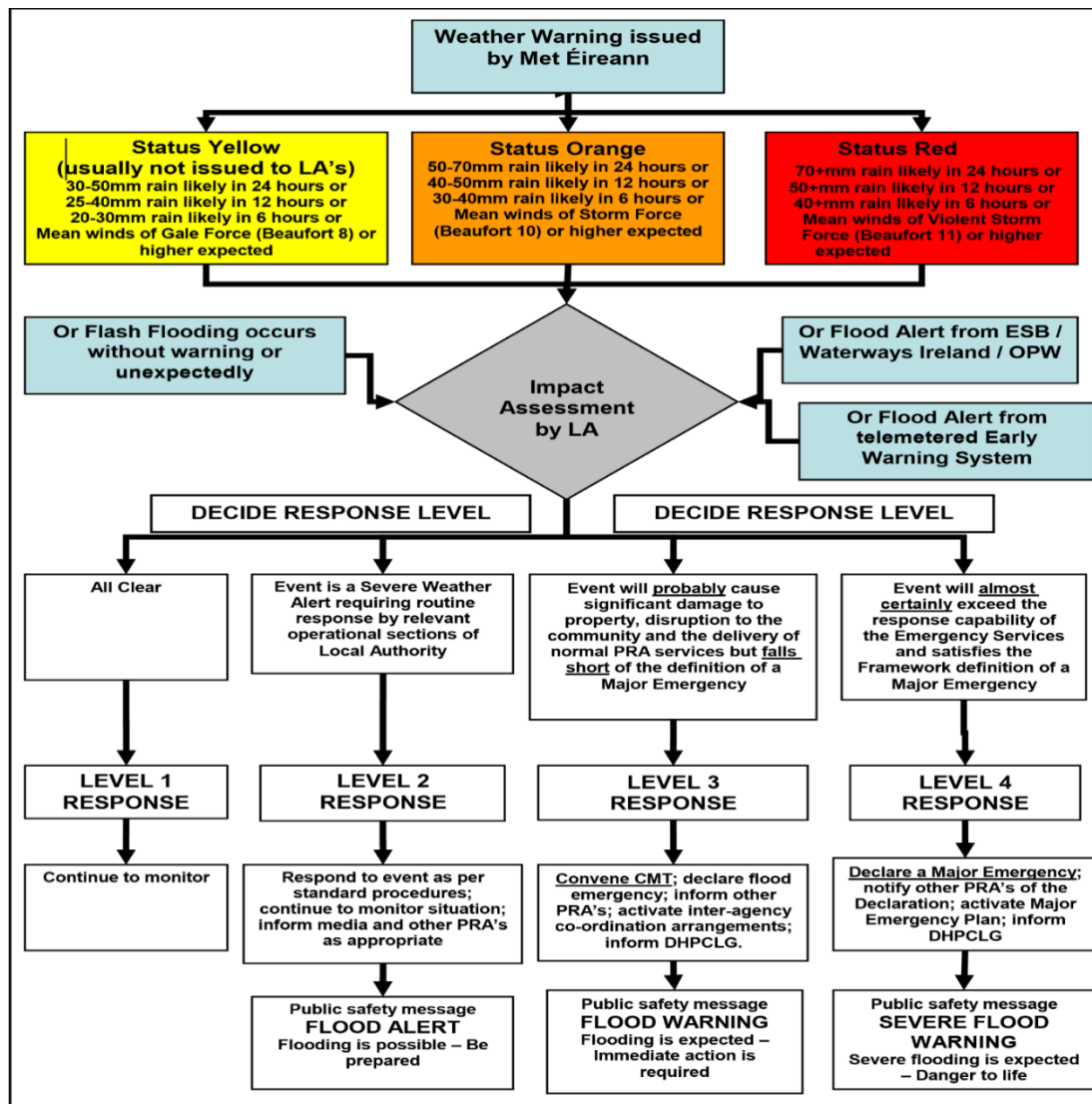
that by using these decision-making mandates we are enveloping or protecting the emergency management structure to ensure that inter-agency coordination is effective, fast and efficient. Thus, suggesting that procedures for inter-agency coordination and the positive outlook on their ability to coordinate as an IEMA assemblage is actually a little superficial as the real aspects of inter-agency coordination such as decision-making processes are mandated and enveloped rather than advised as with the rest of the Framework.

Essentially, my critique suggests that there should be different words used that are not as power-centric or as hierarchically dividing as they are guiding documents, not legislative. They offer suggestions on how to respond and organise as an assemblage during an event but there are no legal ramifications for not following these documents. However, all of this is best practice policy but what actually happens during a major weather event? There is specific in-depth guidance for flooding which corresponds with the Framework and SEMNSF which will help to illustrate the proposed policy shape of the IEMA during an activation.

#### 4.8 Case study of the Flood Guidance Protocol

Due to the complexities and inter-scalar issues across the two anchor policy documents, it was difficult to fully reveal how the IEMA re-shapes between policy and activation. Thus, here I provide a short overview of the 2013 Guidance Document on managing flood events before delving into an actual event to demonstrate the different IEMA shapes in relation to one type of incident rather than in general. The Flood Guidance Protocol was produced by the Major Emergency Management team to work alongside the Framework. It is a detailed guidance document which, in line with the Strategic Emergency Planning Document and Framework, assigns local authorities as the lead agency for a flood event. However, each PRA has a range of roles and responsibilities before, during and after a flood event which this document outlines. For instance, AGS has responsibility around traffic control and the HSE are assigned to deal with any health risks that may develop and are critical in the implementation of evacuation centres. It requests that each PRA has a specific flood emergency plan tailored to their own locality and the development of a flood working group with representatives from the PRA's, voluntary and private sectors. Further, it illustrates the scalar structure of the IEMA during flood events.

Figure 4.8: Flood scales



Source: MEM (2013)

As detailed in Figure 4.8, the Local Authority as the lead agency carries out the impact assessment and decides the response level depending upon the information received from Met Éireann, the ESB, and Waterways Ireland or from the telemetric early warning system. Taking in all the available information, and consulting with members from other Local Authority departments (i.e. the fire department, gully department, and media) they choose the appropriate response level.

Level 1 response is a need to monitor the situation. In this case, the other two PRA's are not involved. If it escalates to a level 2 situation, the event is



seen as severe and may require routine response from operational sectors of the Local Authority (i.e., gully clearing, etc). It is at this stage that the media and other PRA's are informed about a potential situation and the public is alerted to possible flooding.

At level 3 the event will probably cause damage and could affect the normal delivery of PRA services, but it is not a major emergency. Usually, at this stage, it is still deemed localised flooding but at a wider scale – it is not a regional or national event. However, the engineer on call within the Local Authority will alert the FLAG (Flood Action Group) team, which involves 20 different agencies and the setting up of a local coordination centre.

At Level 4 the Major Emergency Plan is activated and the Crisis Management Team is convened. Further, the management of the event is transferred from the Local Authority (who usually will remain the lead in the local coordination centre's around Ireland), to the Department of Environment, Community and Local Government representing an inter-scalar re-shaping of relationships, power structures, governance and scales.

This is a straightforward process. However, flood events are not controllable and so they can often be localised but widespread creating difficulties on when to escalate from level 3 to level 4. When this occurs, the Department of Environment and the Office of Emergency Planning may consult with the Minister for Defence who is the Chairman of the Government Taskforce on Emergency Planning to make the final decision. In severe cases, the decision to declare a national emergency may even go as far as the Taoiseach. So, how did this policy translate to the winter storms and flooding events of 2015/2016?

#### 4.9 Case study 1: Winter Storms and Flooding Events 2015/2016

Winter 2015/2016 involved nine storms between November 12th, 2015 and March 2nd, 2016. This is compared to winter 2016/2017 which had five storms between November 19th, 2016 and March 3rd, 2017. McGrath (2016) argues using, historical storm data that the island of Ireland can expect an average of four stormy winters every 10 years thus, making winter 2015/2016 unexceptional. Even so, November 2015 had an average rainfall of 130%-190%, with Storm Abigail (the first in the new storm naming system (DoHPLG, 2016 and NBC, 2015) passing

north of Ireland between November 12th and 13th. This was closely followed by Storm Barney between November 16th and 18th. The strength of this storm is evident in Figure 4.9 with the highest November gust ever recorded at Shannon Airport (DoHPLG, 2016 and McGrath, 2016). Storm Clodagh occurred at the end of November and brought an end to the third warmest November since 1900. November had 14 days of gusts greater than 50 km/h, with many places recording twice their November average rainfall (DoHPLG, 2016 and McGrath, 2016).

Figure 4.9: Shannon airport, November 2015



Source: McGrath (2016: np).

December 2015 proved to be the wettest since 1850 with Storm Desmond occurring between the 3rd and 8th bringing days of intense rain with up to 36 hours of rainfall in some places (DoHPLG, 2016 and McGrath, 2016). The intensity and longevity of the storm was because it was slow-moving and formed due to a “mild and moist air mass” (DoHPLG, 2016:15). December 12th was another heavy rain day followed by a relatively normal few days until December 20th when there was significant rainfall from the 21st until the 26th (McGrath, 2016). In the middle of this rainfall, on December 23rd, Storm Eva occurred. Then between December 28th and 30th, Storm Frank resulted in more heavy rain and “mean sustained winds of 35 knots” (McGrath, 2016: np). This culminated in “five weather stations recording new monthly accumulation records” of “943mm” from the

previously held record of “790mm” (McGrath, 2016: np). It also proved to be the warmest December since 1855 (DoHPLG, 2016 and McGrath, 2016).

“January was the wettest in the last 20-40 years with half of the total rainfall for the month falling in two days (5th and 9th). However, due to a spell of colder and drier weather, the middle half of the month, was relatively dry until Storm Gertrude hit on the 29th with mean sustained winds of 53 knots with gusts of up to 70” (DoHPLG, 2016:17 and McGrath, 2016: np). The first half of February brought Storm Imogen on the 7th with sustained winds of 54 knots (McGrath, 2016: np). The season ended with the windstorm Jake on March 2nd (DoHPLG, 2016 and McGrath, 2016).

#### 4.9.1 Flooding

Although McGrath (2016) suggests that winter 2015/2016 was not an exceptionally stormy season, the Department of Housing, Planning and Local Government in their ‘Report on Flooding’ (DoHPLG, 2016) argue that it was exceptional as it broke several rainfall records and led to severe flooding countrywide see Figures 4.10, 4.11 and 4.12.

Figure 4.10: Flooding in Lahinch, Co Clare



Source: McGrath (2016: np)

Figure 4.11: Aerial view of the outskirts of Athlone



Source: McGrath (2016: np)

Figure 4.12: Flooding in Kilkenny City

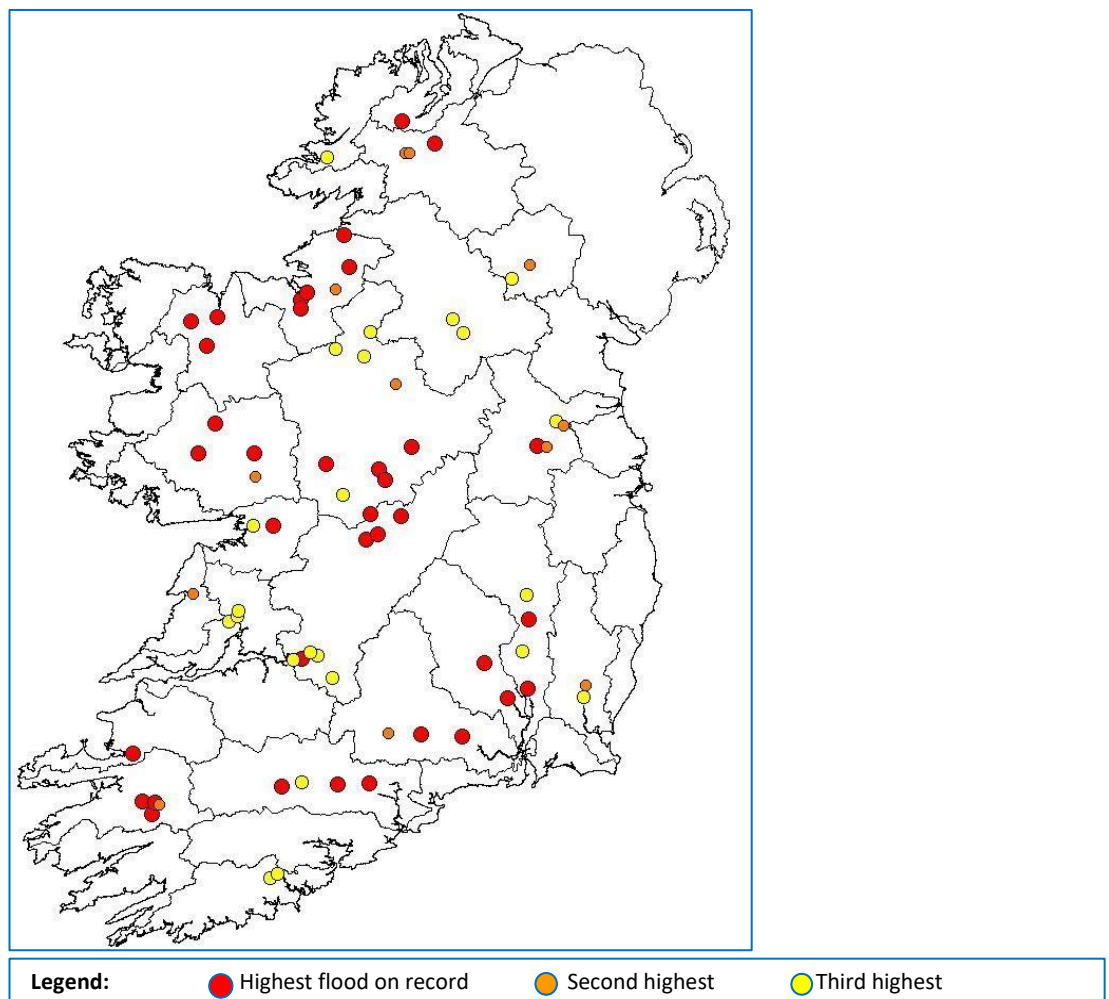


Source: McGrath (2016: np)

It was believed by many that this was the worst flooding on record, so Met Éireann tested this hypothesis through a “reference of 75 water level gauges which were chosen due to the quality of data available” (DoHPLG, 2016:21). The study concluded that the flooding was worse than the 2009 season and thus, the worst on record as “37 of the gauges recorded their highest, 23 recorded their second highest and 12 recorded their third highest meaning that 72 of the 75 gauges recorded extreme levels” (DoHPLG, 2016:21/23 and McGrath, 2016: np).

Storms Abigail, Desmond and Frank were the most significant for flooding, with the largest flood events occurring between the 6th and 13th of December and the 29th December and 5th January, with the “first flood event registered on November 15th” (DoHPLG, 2016:69 and McGrath, 2016: np). This resulted in the country being in a state of flood emergency for two months, with flood events being widespread (see Figure 4.13).

Figure 4.13: Spatial Distribution of the winter 2015/2016 flood events



Source: DoHPLG (2016: 23)

#### 4.10 Inter-agency Coordination during the Winter Storm Events

Up until December 3<sup>rd</sup>, response remained at the local scale with local authorities acting as the lead response agency and coordinating with the other PRA's. From the 3<sup>rd</sup> of December onwards, the National Coordination Group convened and remained in-situ from December 7<sup>th</sup> until January 13<sup>th</sup> inclusively.

No major emergency was declared, but the severe weather protocols of each PRA and the state were activated including the ‘Flood Guidance Document’. The response was multi-scalar and was deemed an all-government response (DoHPLG, 2016). The departments and agencies represented at the governmental level and in the National Emergency Coordination Group for severe weather can be seen in Figure 4.3 on page x, this re-illustrates what the national scale assemblage looks like based on policy, but the ‘Report on Flooding’ (DoHPLG, 2016) provides a list of the departments and subsequent agencies who actually sat in the National Emergency Coordination Group (NECG) meetings during the winter storms. This illustrates a much more pro-active and inclusive assemblage with a clear re-shaping of the assemblage and more dynamic power networks (see Figure 4.14).

For instance, all government departments (noted as the names they operated under in 2015 and 2016) were represented, with key departments also having representatives from the agencies they govern. This is particularly interesting as these agencies have a mix of local, regional and national scales and their representation in the NECG allowed for the smooth transfer of information from the local up to the national scale. This blurring of scales is important because as noted in both the Framework (MEM, 2006) and the ‘Report on Flooding’ (DoHPLG, 2016) and generally, within emergency management theory (Haddow et al, 2016), it is essential to recognise the need for various scales of response within command, control and coordination activities. However, these structures are already operating within specific agencies which then need to be retained but also re-shaped when coordinating across agencies and jurisdictions to ensure an effective response. In terms of this event, it was particularly crucial that all response scales were able to operate effectively and quickly because the flooding was national in that it covered almost every county as seen in Table 4.2 and 28 local authorities claimed for “exceptional costs” from the Department of Housing, Planning, Community and Local Government (2016:58). However, the event was also local as it affected very specific parts of counties see Table 4.2. Thus, the local response was critical in the key areas of emergency management from preparedness, mitigation, response and recovery. Due to it being a protracted event the Defence Forces, the voluntary sector and the community became critical aspects in the local emergency management assemblage with the ‘Report on Flooding’ (DoHPLG, 2016:49) stating in detail the

need to broaden and clarify the role of the volunteer sector and "community volunteer". This was because the quick and coordinated response, resilience and community spirit helped to ensure that fewer houses and businesses were affected by these storms than had been by the 2009 storms even though the water levels were higher this time.

Table 4.2: Flooded Locations with Date of Initial Reports of Flooding

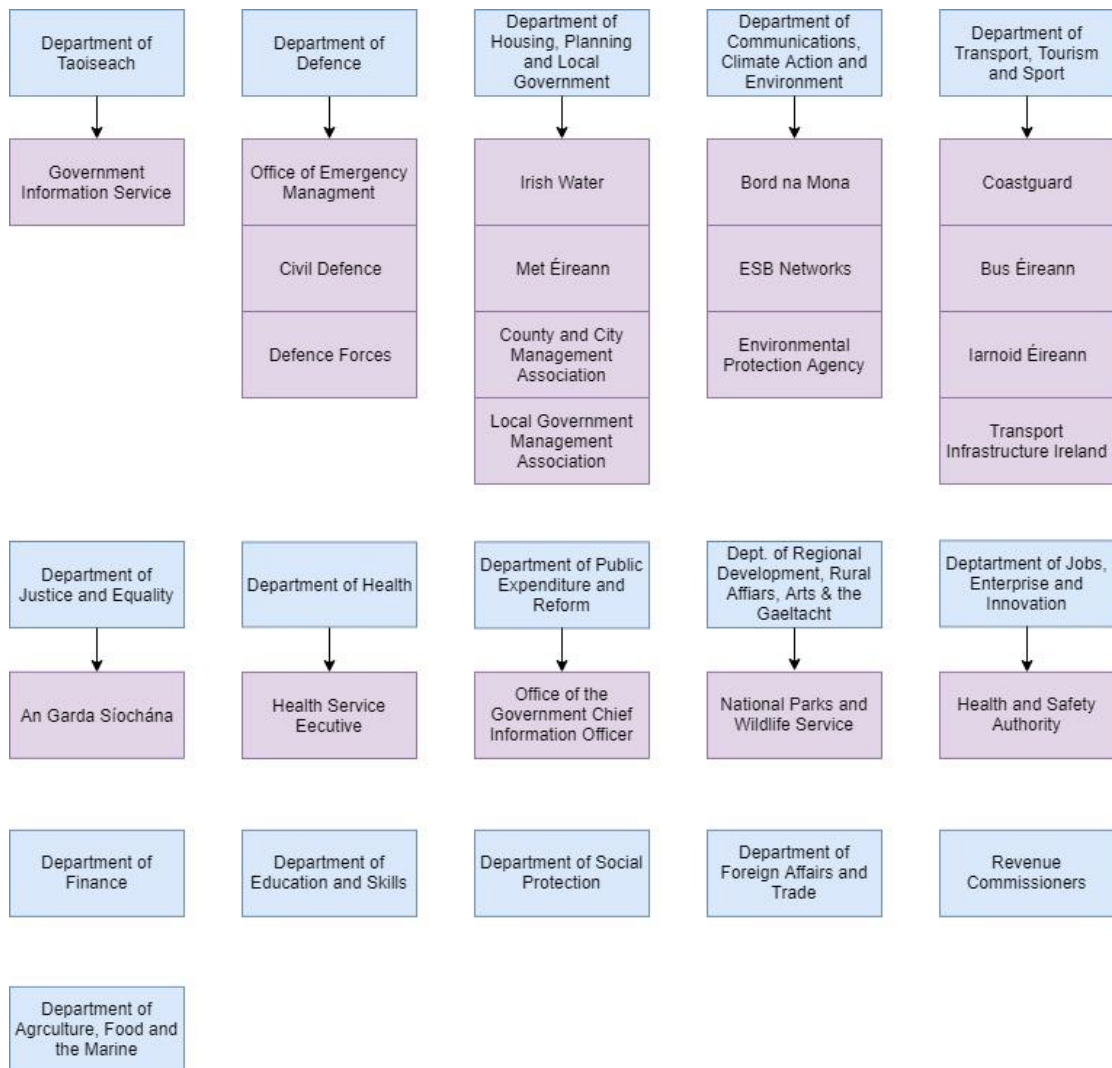
Location of Flooding	County	Date of Initial Reports of Flooding
Bandon	Cork	05/12/2015 and 30/12/2015
Athlone	Westmeath	05/12/2015
Crossmolina	Mayo	05/12/2015
Castlefinn	Donegal	05/12/2015
Ballybofey	Donegal	05/12/2015
Ballinasloe	Galway	05/12/2015 and 05/01/2016
Claregalway	Galway	05/12/2015
Portumna	Galway	05/12/2015
Ennis	Clare	05/12/2015
Feakle	Clare	05/12/2015
Killarney	Kerry	05/12/2015
Athleague	Roscommon	06/12/2015
Craughwell	Galway	06/12/2015
Galway City	Galway	06/12/2015 and 02/01/2016
Foxford	Mayo	07/12/2015
Monaghan	Monaghan	07/12/2015
Montpelier	Limerick	09/12/2015 and 05/01/2016
Castleconnell	Limerick	09/12/2015
Annacotty	Limerick	13/12/2015
Corbally	Limerick	13/12/2015
Shannonbridge	Offaly	15/12/2015

Carrick-on- Shannon	Leitrim	16/12/2015
Springfield	Clare	28/12/2015
Dundalk	Louth	28/12/2015
Graiguenamanagh	Kilkenny	29/12/2015
Thomastown	Kilkenny	29/12/2015
Inistioge	Kilkenny	29/12/2015
Clonmel	Tipperary	29/12/2015
Midleton	Cork	29/12/2015
Fermoy	Cork	30/12/2015
Mallow	Cork	30/12/2015
Enniscorthy	Wexford	30/12/2015
Cavan	Cavan	28/12/2015

Source: DoHPLG (2016: 25/26).



Figure 4.14: Departments and agencies who attended the National Emergency Coordination Group for winter storms 2015/2016



Source: Figure information retained from the 'Report on Flooding' (DoHPLG, 2016).

So, how does this collaborative inter-scaler, inter-agency and inter-jurisdictional coordination re-shape the assemblage and the power networks that allow it to function on a day-to-day basis? There is a specific policy shape to the IEMA, but it cannot adequately describe how these departments, agencies and groups will re-shape and operate during a major emergency. Reports written after major events are critical for gaining insight into how these assemblages actually work and respond and for development of lessons which can inform new relationships, power dynamics and destruct and re-develop an assemblage or part of

it. The 'Report on Flooding' (DoHPLG, 2016) provided insights into six ways in which the coordinating aspect of the flood events re-shaped the assemblage and changed how the power within it operates.

Firstly, the shape of the assemblage as illustrated is policy-based and conforms to everyday workings, meetings, policy and report generation. It does not represent the actual assemblage formation in response to major emergencies. The shape of the assemblage changes as the IEMA shifts from a primarily covert and policy generating assemblage (not including the first responder agencies which are active on a daily basis) to a response agency in light of a major emergency such as the flood events. This shift is the catalyst for the oscillation of the assemblage where it moves from being hierarchical towards flatter with some agencies or aspects of the assemblage still operating within the messy middle. This is critical for understanding power. In its everyday shape, power is structured and controlled with very clear networks, sovereign authorities and decision makers. However, as the assemblage is actioned for a response, power becomes more dispersed, splintered, bounces and encapsulates Foucault's understanding of power is everywhere. Each agency retains its internal structures of command and control, but then must fit within a broader response system using its own structures, while power is splintered between agencies and departments resulting in power bouncing between agencies with specific skillsets.

Secondly, the use of a single response room for the National Emergency Coordination Group is superficial for the ease of information sharing and effective decision making. On a more critical level, it changes how the departments and agencies interact as it re-shapes the assemblage from being in a hierarchical pyramid structure with very clear levels of authority and straight-forward power networks and sovereign authorities to a flatter shape where the government departments are all on the same level with no obvious structural hierarchy between them except for the acknowledgement that the lead government department should be, and was, the Department of Housing, Planning, and Local Government. However, the Department of Taoiseach and the Department of Defence are both present and in the policy are the highest authority over emergency management, so there is a conflict or tension between the power dynamics of these departments on who is the final decision maker. This then shifts the assemblage back into a messy

middle position where, depending on the situation and the people present, the current Taoiseach and Ministers, affects how these departments actually work together with a defined lead agency, but also within a clear statutory hierarchy. This relates to the idea of imagined assemblages, where people can know their role and responsibilities, but due to perceived power and hierarchy defer to those above them thus re-creating the assemblage as one that is deflective of policy and reflective of Foucault's idea of the subject, social discipline and authority.

This departmental relationship, combined with the presence of agencies parented by other departments, also re-creates the power structures of the assemblage. The senior officials of these agencies are representative of the operational staff on the ground and engage with their department as well as with other agencies and departments. However, as the gatekeepers of local information, there is a splintering of power and an illustration of how power bounces. Power is splintered as the parent authoritative departments rely on the agencies to provide real-time information on the emergency, staff and resources, issues and anything else pertinent to the response or recovery stages. However, this power is further splintered as it moves from the NECG to the local scale where the local coordination centres capture the information and choose what is necessary to share upwards. Power bounces between the departments at the national scale and at the local scale based on the most critical threat or issue at that point. Although the Department of Housing, Planning, and Local Government and the relevant Local Authority are the lead for flood events when issues around health or welfare arise the lead agency may shift to the Department of Health and HSE as described by participant ID05 from the HSE.

“There is a formal handover at that time and you may find, we will just say for instance and this would be an extreme example, following a flooding you will always have flood waters, you will have problems with infestations, biological threats but if it was deemed that that threat was the worst then the HSE might take the lead at that point”.

Thirdly, the positioning of the Civil Defence during the winter events as an agency of the Department of Defence is crucial for understating the often-blurred lines and positioning of agencies in the assemblage. The Civil Defence

is under the authority of both the Department of Defence and the Department of Housing, Planning and Local Government and at the local level provides its services under the relevant Local Authority (Civil Defence Strategic Plan, 2010). Thus, during the winter storms, the governance of the Civil Defence was messy as their position in the assemblage was constantly oscillating between being structured in a formal hierarchy when directly commanded by the Department of Defence and becoming flatter in structure when they were operating at local scales after being requested by relevant local authorities (DoHPLG report, 2016). This oscillation and messy re-position of the Civil Defence emanates due to tensions between the Civil Defence and the DoHPLG “one of the problems with the MEM is it is under the Department of Environment and they don't talk to use” (Participant ID14). Further, the power dynamic the Civil Defence has within the broader assemblage, ensures that its position, however fluid, is retained within the assemblage at national scale as it is the only voluntary agency who was invited to attend the NECG during these storms.

Fourthly, no national emergency was declared and yet the national structure for responding to severe weather events was activated while keeping the majority of power and responsibility at the local scale. This is where the scaling of events and the procedures become unclear within Irish policy and illustrate a covert sovereign authority. The local or regional scale in Ireland can request the declaration of a national emergency, but as with the 2015/2016 storms and preceding and subsequent events, the national scale can self-establish which is akin to the ideas of ‘oikonomia’ because the “King rules but does not govern”. At the national scale they receive and amalgamate information, organise resources and provide guidance and support, but the responsibility remains at the local scale where they have a providential will regarding the level at which they will engage with the national scale, the Framework or coordinate with other local agencies. Thus, power is splintered and dispersed across the PRA’s and, in particular, the local authorities as the lead agencies activate their own plans and ensure that all needs are met (Gordon, 1972 and Sennellart et al, 2007).

Fifthly, with providential will comes the ability to retain control over the activation of agencies and their resources as illustrated by the ‘Report on Flooding’ (DoHPLG, 2016) which discussed that the Defence Forces were

introduced to the response through an invite by the relevant local authorities and the LGD. However, prior to these events, a letter was distributed to all local authorities by the Defence Forces outlining how exactly the Defence Forces and their resources could be deployed, thus creating a strict boundary of operations. Post the 2015/2016 storms, the Defence Forces developed these boundaries further reflecting upon their role during the flood events where they deployed “3488 personnel, 626 vehicles and 10 helicopter flights” (DoHPLG, 2016:47) as illustrated by the following conversation with participant ID22.

**ID22:**“No, we conducted a post-event review following the severe flooding during winter 2015 and early 2016 and we held a civil authority conference, it was an internal conference. I suppose we released the updated directional review earlier in the year and we looked at how we could improve things should one of these scenarios happen again. And one of the areas that came up was a request for assistance per forma because sometimes when requests come in it might be facts and they might be difficult to read, or the facts may not have the particular point of contact that the local leaders in the Defence Forces are going to meet out on the ground. Sometimes the exact location of the exact task might be a little bit unclear so by having this form it would give people as much information so that they can prepare to the best of their capabilities before they deploy.

**Interviewer:** I think you might be one of the only agencies [...] that has this form [...].

**ID22:** I didn't want, and I stressed it at the conference, I didn't want this to be another layer for people to think we don't want to be requested and this is more bureaucracy, it wasn't that at all. It is to really help the corporal or the sergeant who works in the local barracks when he goes out on the ground to meet the people and it is to give them as much information as possible”.

Sixthly, the role of Met Éireann in predicting the storms and subsequent flooding, and the use of the storm naming system and colour code system for the first time ensured more cooperation and response from communities. This contributed to the enhanced role that the local community had in the response effort and introduced them as a key aspect of the IEMA (DoHPLG, 2016) especially in

relation to the sharing of local knowledge with response agencies as described by participant ID02 who argues that "you are dealing with the people who know what they are talking about [but that] it is also utilising local knowledge". Although the new naming and colour coded system were effective for a more efficient and coordinated response, the 'Report on Flooding' (DoHPLG, 2016) argues that the role of Met Éireann and early warning systems need to be further developed into a national flood forecasting and warning service. Although Met Éireann is under the authority of the DoHPLG, they are a highly autonomous agency offering the most relevant and real-time information for the implementation of response networks thus, they are assigned much more power and a voice both within the NECG and in front of the public too. However, it is a different type of power, it's not one of control or authority, but one of knowledge and truth which the departments and PRA's then internalise and assess within their own institutional and cultural practices and respond by following their own severe weather plans and the procedures laid out in the Framework. Thus, as there is some providential will, the Met Éireann warnings can be assessed by multiple agencies at different scales and the approaches to response can differ slightly. These slight changes were not outwardly included in the report, but the choice of recommendations for the local scale response suggests that the national scale recognised the differing approaches and slow response mechanisms. They recommended several lessons and future implementations, five of which are mentioned below.

1. "Measures should be considered to further enhance the dissemination of public information in the lead up to severe weather emergencies to strengthen individual preparedness and improve public safety" (MEM, 2006:35).
2. "Local Authority Severe Weather Teams should review their arrangements for convening and maintaining operations throughout a prolonged emergency" (MEM, 2006:47).
3. "Standardised templates for reporting from local level to national level should be developed" (MEM, 2006:47).
4. "It is recommended that local authorities give more public visibility to their coordination work so that the public know who to contact and how if they need to during an emergency" (MEM, 2006:72).

“While the Framework for Major Emergency Management is seen as effective in underpinning the coordination of the response last winter [2015/2016], the National Steering Group has decided that it will be reviewed with a view to incorporating learning points from recent severe weather emergencies to further enhance inter-agency co-operation in response related activities” (MEM, 2006:72).

#### 4.11 Conclusion

The IEMA works. It responds, it coordinates, it is effective. However, the policy documents are over complicated, often contradictory and the procedures and systems are often replications of other groups and processes. With a future revision of the Framework, there is potential to streamline emergency response, share the knowledge up and down the scales, increase training and reduce working and steering groups and offer a more concise, easier to follow manual for dealing with major emergencies. It is also essential to choose the terminology and use it in respect of every aspect of emergency management in Ireland. The Framework and other guidance documents should also recognise the importance of informal networks and legacy institutional cultures which may hinder efficient inter-agency coordination. Meanwhile, jurisdictional boundaries, in the case of major emergencies, could be re-drawn so that governance can be more straightforward, with less reliance on quick decisions amongst a small cohort of senior officers from different agencies. These suggestions should be a focal point to ensure a future of efficient inter-agency coordination in Ireland.

Further, inter-agency coordination has a direct role in how an assemblage oscillates and re-shapes from the recognised ontological positions of assemblage theory. This chapter illustrated this idea by providing evidence of the IEMA in action and determining that at times it occupied a messy middle space where aspects could be hierarchical and flat simultaneously. However, more importantly, it brought assemblage theory and the idea of ‘oikonomia’ together by arguing that humans have a providential will and can reject formal structures and boundaries, deconstructing the assemblage, and instead, responding based on working histories and informal networks. This introduces a different idea of assemblages as entities which can be formal and informal but only work and are sustainable if the participants remain within their designated positions. The next chapter repeats this format in light of the USEMA.

## Chapter 5: Framing the United States Emergency Management System

### 5.1 Introduction

The aim of this chapter is to provide a deep exploration into the history, policy and activation of the United States Emergency Management Assemblage (USEMA). It will contextualise the USEMA and evaluate why it may oscillate positions between policy and activation. There are three objectives to this chapter:

**Objective 1:** An exploration of the historical adoption and evolution of emergency management in the United States.

**Objective 2:** An in-depth interpretive analysis of the key policy documents supporting the formation and operation of the USEMA.

**Objective 3:** The analysis of the response to the Boston Marathon Bombing in April 2013 to illustrate the re-shaping of the USEMA from policy to activation.

The United States Emergency Management Assemblage consists of first responder agencies, government departments, voluntary agencies, private enterprises and other organisations of value, i.e. agencies which can provide different benefits in times of need, as well as technology, processes and cultures. Formally, the USEMA is hierarchical with clear networks of power at the local scale and policy which is influenced by the state and federal scale. The mechanism by which crises are escalated upwards is documented through the Stafford Act 1988 and supported through a range of other legislated policy documents which emanate from both the state and federal scales. Policy documentation at the local scale was difficult to obtain, thus the websites of Boston's Office of Emergency Management is utilised, as well as key findings from the Boston participants.

This chapter frames the US Emergency Management System in the same manner that Chapter 4 framed the Irish system. The anchor Act for dealing with major emergencies is the Stafford Act and it is discussed alongside policy that refers to it, such as the National Response Framework (DHS, 2013) and the Massachusetts Comprehensive Emergency Management Plan (2017).



Using these documents, as well as others, this chapter provides a detailed overview of the federal scale and the evolution of the Federal Emergency Management Agency (FEMA) through key policy moves, illustrating that FEMA was born, died and resurrected through two key phases 1980-2001 and 2001 to present. A discussion on state-scale response in Massachusetts will follow illustrating the relationships between the federal, state scale and local scale and the policy and procedures in place for dealing with major emergencies in the State. Boston, as the local scale, will then be discussed exploring their inter-agency and inter-jurisdictional relationships through some key participants. The conclusion will then identify some of the benefits and disadvantages of the system including, its formalised structure, neglect of the informal and its military connotations. Finally, the Boston Marathon Bombing in April 2013 which resulted in 3 deaths, mass casualties and a week-long response effort is studied to illustrate how the USEMA oscillated from its policy-dictated shape to new shapes during three unique stages of the week-long response.

## 5.2 The Evolution of Emergency Management in the United States of America

In the early to mid-20th century, emergency management in the USA was militarised and preoccupied with the protection of their territory from foreign intruders. This occurred at the national/federal scale and was characterised by military action and spending with no clear theoretical foundation. However, "the Civil Defense Act of 1950" (Marietta, 2012; 111) was the first key moment in modernising emergency management as it shifted the focus from large-scale protection to local scale emergency management. However, the Act was still security driven and overlooked non-security but more frequent events that occurred at the local scale (Marietta, 2012)<sup>14</sup>.

It was not until the 1970s that contemporary emergency management theory and practices began to emerge in two ways according to Marietta (2012). Firstly, there was a recognition that although there are emergencies that require military response at the national/federal scale, there are also emergencies at the local scale that require a civil response. Thus, the 1970's mark a transition

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<sup>14</sup> It is worth noting here that in the US the local scale can be understood as a much wider area than in Ireland. For instance, hurricanes can cross multiple states and are deemed both regional and local simultaneously. Regional as they cover such a large area and local as each area responds independently.

from a military approach which predominately focused on the threat of nuclear war, rather than 'actually occurring' events, to a system that recognised and planned for a range of hazards (Marietta, 2012) and the 'Civil Defense Act of 1950' is amended in 1976 to include events of a non-military nature (Marietta, 2012 and Canton, 2007). Secondly, a more theoretical foundation for emergency management was formalised as opposed to the ad hoc coordination that had occurred at the local scale prior to the 1970s.

In 1979, US emergency management was continually evolving and was being theorised as a continuous and cyclical process (O'Riordan, 1992; Marietta, 2012) of "mitigation, preparedness, response and recovery" (Baird, 2010, O'Riordan, 1992; Rogers, 2011) known as 'Comprehensive Emergency Management' (CEM) (O'Riordan, 1992; Marietta, 2012; McEntire, 2007). This emerged via a publication titled 'A Comprehensive Emergency Management: A governor's guide' (1979) which deemed that the theoretical foundation and best operational practice for emergency management was to utilise the all-hazards approach and further it by incorporating socio-economic and cultural contexts within plans and procedures.

The guide explained the procedures for the management of domestic crises and was an important step in moving emergency management away from its military connotations and connections (National Governors Association, 1979 and Marietta, 2012) and it was a key contributing factor to the development of FEMA.

After the development of CEM, local scale emergency management further evolved due to different Fire Departments in Southern California actively coming together to coordinate and respond to crises in the region as they found that different institutional "cultures", "procedures" and debate over who the "on-scene authority" was created conflict (Marietta, 2012:103). Thus, the "Fire Departments were forced to form inter-institutional relationships and find a common means of communication (both technologically and culturally)." (Marietta, 2012:103). This resulted in the development of "FIREScope (Firefighting Resources of Southern California Organized for Potential Emergencies)" (Marietta, 2012:104 and Canton, 2007:89). The idea behind FIREScope was to create the

structures that coordinate different agencies in terms of protocol and management prior to an incident. This evolved into an Incident Command System (ICS) (Marietta, 2012) which became the common system across US Fire agencies. It also began to be used for the coordination of other agencies such as Police, EMS (Emergency Medical Services) and Voluntary Agencies. ICS "creates a standardised, scalable organising structure that emphasises flexibility during emergency management and creates a process for unifying the command, operations and support functions of all responding agencies [...] so that the best outcome can be achieve[d] while ensuring that the disciplines do not work at cross-purposes." (Merietta, 2012: 104/105).

However, it was not until after 9/11 that two major reforms took place. Firstly, the ICS became the "standard operating procedure of multi-agencies emergencies" (Merietta, 2012:105; Canton, 2007) and was expanded to become the National Incident Management System (NIMS) to coordinate various agencies during a range of crisis and it has "advantages, including scalability, multi-hazard flexibility, and especially inter-disciplinary coordination." (Merietta, 2012:105-106 and FEMA, 2016). Secondly, there was the emergence of the Department of Homeland Security (DHS) which is an overt and controlling mechanism of the sovereign authority at the federal scale. This resulted in DHS changing organisational structures such as the dismantling and re-establishment of FEMA with an increased focus on terrorism combined with less transparency and inter-agency coordination. Thus, emergency management, although decentralised, still has strict governance structures which operate through a mechanism of shared but dispersed power to protect certain truths, infrastructures and people (such as, institutional cultures, siloed agencies, and frameworks which are government tools of control and power during major events). In an era of neoliberal policy and the roll back of the state, the federal and regional scale still retain power over emergency management plans. However, there is still a need for other agencies (both the public and private response agencies) and citizens within communities to be actively incorporated especially at the local scale in the formation of emergency management policy or wider policy which informs community risk as discussed by participant IDI.

“They are not thinking ‘actually we should be talking to our local communities and seeing what they want.’ [...] But what we noticed was there

was planning going on but not with the community and whatever was happening in terms of a conversation about climate change adaptation it wasn't involving the community and no resources were being funnelled down to community planning". (Participant IDI)

Thus, through the NIMS development, the institutionalisation of CEM and the development of FEMA and DHS, the discipline of Emergency Management created a shift in how policies and procedures were written and implemented. However, Haddow and Bullocks (2005) argues that FEMA and DHS are actually no longer adopting a CEM or even an all-hazards approach to emergency management as they are preoccupied with terrorist-related events and are increasingly overlooking natural and technological hazards. A recent example of this is the governance and management of Hurricane Harvey in Houston, Texas which saw a slow uncoordinated emergency response (TIME, 2017; New York Times, 2017). This also reflects a return to a more militarised and national scale response, shifting the direction of emergency management once more as a result of governance shifting from discipline to control (Kitchin et al, 2017).

The above section offered snippets of the evolution of emergency management as a discipline and practice. These historical moments affect how the USEMA is shaped within policy and offer insights into why the USEMA may oscillate positions and re-shape when activated. To explore this, the different policies that operate at the different scales of the USEMA need to be identified and explained. This will provide an understanding of how the USEMA is shaped in policy before the case study illuminates its shape during activation.

## 5.3 USEMA Policy

### 5.3.1 Federal Scale

The governance of the United States is defined as a “constitutional federal republic” (US Department of State, 2004: 3). This differs slightly from the model of democracy which governs Ireland in that the United States Constitution creates the structures in which all government scales operate and this, in turn, weakens the power of the Federal Government. Thus, the use of the term ‘federal’ reflects on the decentralised network of governmental power resulting in a national government and separate governments in each state (US Department of State, 2004). However, the forms of governance used in the US and Ireland are similar in terms of their status as republics in which both countries elect representatives to act on their behalf.

The United States Constitution explicates the organisation and powers which the federal government are in control of, such as national defence and engaging with foreign powers amongst others, as described by the US Department of State (2004). The US constitution also refers to the role, responsibilities and power of state governments limiting the power of the Federal Government. Each state retains its own constitution in which it describes the role of the local. The local scale retains more power and responsibility than in Ireland as US local government have responsibility for “cities, counties, towns, school districts, and special-purpose districts, which govern such matters as local natural resources or transportation networks” (US Department of State, 2004;5).

However, this organisation of decentralised governance and power as dictated by the US Constitution is not black and white as over time it has been amended to reflect current needs and this has changed the role of the federal government and increased its influential powers over states. For instance, the federal government creates and funds programs which are then delivered by individual state governments, for example, emergency response. However, as these programmes are federally funded the finance can be withheld from the state if they do not concede to the instructions of the federal government, creating influential power stemming from the federal to the state and in turn to local governments. The US State Department (2004) refers to an example which occurred in the 1970s when the federal government needed to lower highway speeds and instead of legislating lower limits

they withheld state finance until the states reduced the speeds themselves. Further, the influential power that the federal scale have on emergency response was described by a representative of emergency management policy in Boston.

“It’s called NIMS [National Incident Management System] and ICS [Incident Control System] and those are mandated to be used by the Federal Government, the US government says that if you want money from us to do preparedness response work these are the things you must do.”  
(Representative of a US emergency management agency)

### 5.3.2 Federal Emergency Management Agency

Emergency management at the federal scale is managed by FEMA. The origins of FEMA can be traced back to the 1978 National Governors Association who published a report on emergency preparedness which illustrated concern over weak national policy and coordination. The report recommended the amalgamation of siloed federal programmes, the creation and use of comprehensive emergency management and for a concentration on mitigation and recovery (Drabek and Hoetmer, 1991 and FEMA, 2012). This report and the criticisms that the Federal Government faced after the Three Mile Island nuclear power plant accident in March 1979 in Pennsylvania resulted in President Carter supporting the amalgamation of federal programmes, resulting in the development of FEMA (FEMA, 2012). The 11 agencies which amalgamated to form FEMA are:

- “Defense Civil Preparedness Agency, Department of Defense.
- Federal Preparedness Agency, General Services Administration.
- Federal Insurance Administration, Housing and Urban Development.
- Federal Disaster Assistance Administration, Housing and Urban Development.
- National Fire Prevention and Control Administration, Department of Commerce.
- National Fire Academy, Department of Commerce.
- Community Preparedness Program, National Weather Service (Commerce).
- Dam Safety Coordination, Executive Office of the President.
- Earthquake Hazard Reduction Program, Executive Office of the President.
- Consequences Management of Terrorism, Executive Office of the President.

- Warning and Emergency Broadcast Program, Executive Office of the President.” (FEMA, 2012:NP)

FEMA was assigned with responsibility for federal policy, resources for response and inter-agency coordination both horizontally and hierarchically (FEMA, 2012). Initially, the FEMA director was appointed by the President until the development of the Department of Homeland Security following 9/11. However, the amalgamation of 11 agencies created tensions and issues which foreshadowed the bureaucratic issues which the Department of Homeland Security would later face.

### 5.3.3 Phase 1: 1980-2001: The Birth of FEMA

This period represents a series of plans, policies and technologies implemented to coerce inter-agency coordination and a smoother transition from siloed agencies into a single agency. FEMA aimed to focus on the mitigation and recovery aspect of emergencies but like Ireland, they focused on accidents that had already occurred rather than on future threats and risks.

Thus, between 1982 and 1983, FEMA adopted the Integrated Emergency Management System. This program appears to be aligned with the principles of the all-hazards approach as it aims to ensure the maintenance of “emergency management capabilities nationwide for all types of emergencies and across all hazards at all levels of government” (FEMA, 2012: Nd and MA-CEMP, 2017). It was developed to reduce the jurisdictional issues of several often incompatible or duplicated plans resulting in resource wastage and tension between equally qualified responders for responsibility and control of an event (Perry and Mushkatel 1986, Blanchard 1986 and FEMA, 2012).

In 1987, President Reagan’s ‘Presidential Policy Guidance’ attempted to shift focus from all-hazard Civil Defense Programmes, which had become the central focus of emergency management for the mitigating and management of hazards, back towards militarised programs particularly related to protecting US territory from soviet nuclear threat (FEMA, 2012; Marietta, 2012). The shadow of militarised and national scale emergency management was a crucial hurdle for FEMA to overcome and this last push by President Reagan undermined FEMA’s remit.

In 1988, the Robert Stafford Disaster Relief and Emergency Assistance Act was implemented. This Act has proven to be crucial for current emergency management, with participants using it as the foundation for current emergency management practice. As Participant IDG argues: “the law that spells out how all this works is the Stafford Act”. This Act is similar in tone and focus to the Strategic Emergency Management National Structure and Framework (SEMNSF) document in Ireland with the key difference being that the Stafford Act is enforced, while the SEMNSF acts as the Irish national scale advisory policy document. However, both focus on how to manage emergencies and the different roles and responsibilities of relevant national agencies. The Stafford Act focuses on pre-mitigation and preparedness in a way that is lacking in the SEMNSF.

The Stafford Act was implemented to create federal assistance for state and local governments with Congress wanting them to develop comprehensive disaster preparedness plans and to prepare for inter-agency coordination at all scales (Stafford Act, 1988). The Act is amended from the Disaster Relief Act of 1974, with further minor amendments in 2000 and 2006, and is responsible for the current system in which a Presidential disaster declaration is needed before federal assistance can be provided. This reduces the power stripping of state and local government who retain control over their own disasters unless increased resources are needed from the federal state, at which point the State Governor will request a presidential declaration. If no declaration is made, then the local and state scale are not afforded federal funds and resources. There are two avenues for achieving the presidential activation as discussed by participant IDG, a researcher at Harvard.

“If there is a disaster that happens that is big, or if it is a natural disaster like a hurricane which you see coming, you know these places open up and once damage has been incurred you do your best to make an estimate. Or if the Hurricane is coming up the coast you kind of make an estimate of what you think the impacts will be. Then the State Emergency Management agency will put together a report. They will forward that to the governor, the governor will then submit that to the President and that report basically asks for what they call a Federal Disaster Declaration. If it is after the incident has occurred or if in the case of a hurricane it’s called a pre-landfall declaration and basically those are the legal requirements to start the money flowing to



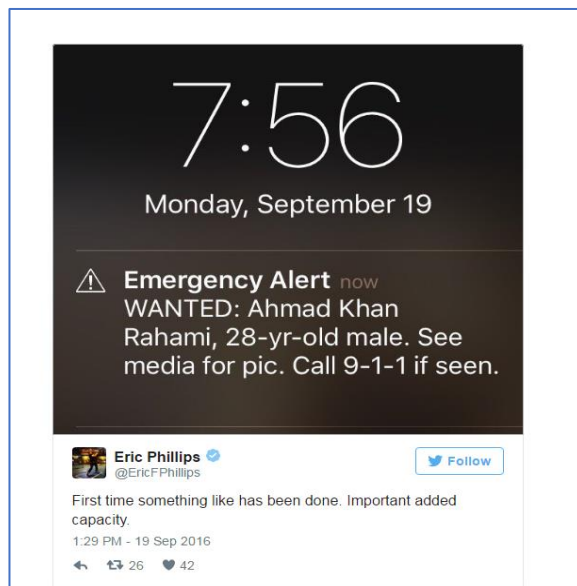
start FEMA to open up their challenges and to start a national level response. But that is how things get from the state all the way up to FEMA”.

The Stafford Act is a highly detailed document consisting of 180 pages that illustrates how federal emergency management operates today. “Title II: Disaster Preparedness and Mitigation Assistance” states that the President can:

1. Establish a disaster preparedness program that coordinates relevant agencies and allows the President to provide technical assistance to states while they are completing a comprehensive plan to prepare for disaster.
2. Provide grants to states for preparing emergency plans.
3. Establish pre-disaster hazard mitigation programs which provide financial support to states from the national pre-disaster mitigation fund.
4. Create a federal inter-agency task force for the implementation of pre-disaster mitigation plans which are provided by the federal government.
5. Implements a disaster warning system. This involves the readiness of all appropriate federal agencies to provide warnings to states and local authorities who then share the warning with the public. The President can make use of civil defence communication systems and commercial systems which are given voluntarily.

However, the use of commercial systems for issuing warnings is no longer restricted to a presidential decree as evident in New York. “On September 17th, 2016, following an explosion in Chelsea, Manhattan, a mass terror alert was issued by the Office of Emergency Management, New York Police Department and the FBI through all phone networks (see Figure 5.1). It was received by an unknown number of people and provided information about the key suspect - Ahmed Khan Rahami. The Press secretary for New York Mayor, Bill de Blasio, stated that it was the first use of this alert at a "mass scale" and the suspect was caught within 3 hours” (Delaney, 2016).

Figure 5.1: Smart phone terror Alert.



Source: Twitter.

“Title III: Major Disaster and Emergency Assistance Administration” (Stafford Act, 1988) discusses the federal response after the declaration of a major disaster. The President will appoint a federal coordinating officer who oversees initial appraisals, the development of field offices and coordination across all scales. The President’s staff will also create emergency and regional support teams. Further, it sets out the requirements for state mitigation plans. These include a description of mitigation processes and support for the development of local mitigation plans (Stafford Act, 1988).

“Title IV: Major Disaster Assistance Program and Title V: Emergency Assistance Programs” (Stafford Act, 1988) are similar with both discussing how a presidential declaration is made as discussed by participant IDG above. The request from the Governor should include the number of resources available and a commitment to cost-sharing, the situation must be deemed beyond state capabilities. Title IV also allowss for the Governor to be able to request the President to direct the Secretary of State to use the resources of the United States Department of Defense for emergency work. Emergency work for the Department of Defense is similar to the work that the Irish Army carries out during crises and includes clearance and restoration. However, unlike in Ireland where the Defence Forces can be used for a protracted period, the Department of Defense can only be used for a maximum of ten days before they return to military duty (Stafford Act,

1988). Under Title V the President can also declare a major disaster without the Governor's approval or request if it is deemed to fall under the responsibilities of the US Government, as outlined in the United States Constitution.

There have been several criticisms levied against the Stafford Act especially considering the response to Hurricane Katrina, with a particularly damning article in *Frontline* by Leger et al, (2009). Two of these criticisms are: that it is slow due to the inefficient mobilising of different scales of bureaucracy which creates barriers to effective and fast federal response (Tierney, 2001), and that it is a discretionary law. The President does not have to declare a major disaster and by not declaring such, certain facilities will not be re-built or protected, and lower-income citizens will be adversely affected and that there is no requirement for citizen engagement in the recovery aspect of a major emergency.

The next major change for FEMA, after the Stafford Act, was the appointment of James Lee Witt as the Director by President Clinton in 1993. Director Witt was the first professional Emergency Manager to be appointed to the position (FEMA, 2012) resulting in significant changes to FEMA's focus by making mitigation a priority, while disaster relief and recovery were streamlined. This resulted in two important policy documents which attempted to identify risks and preparation before disasters occurred. In 1993, the Hazard Mitigation and Relocation Act was a proactive response to dealing with flood risks as it relocated vulnerable houses and businesses away from floodplains. In 1996, the Defense Against Weapons of Mass Destruction Act (also known as the Nunn-Lugar-Domenici Act) was legislated to finance counter-terrorism in light of the "World Trade Center Bombing in New York City in 1993, the Tokyo, Japan Subway Sarin Gas Attack (1993), and the Murrah Federal Office Building Bombing, Oklahoma City, Oklahoma (April 19, 1995)" (FEMA, 2012:nd).

#### 5.3.4 Phase 2: 2001-Present: The Birth of the Department of Homeland Security and the Death and Resurrection of FEMA.

The second phase of Federal Emergency Management began in 2001 with a clear focus on terrorism and the creation of the Department of Homeland Security in response to 9/11. The Homeland Security Act of 2002 resulted in two key policy implementations for the management of major emergencies. Firstly, it enabled

the Department of Homeland Security to create the National Incident Management System (NIMS) (GAO, 2006: 6 and MA-CEMP, 2017). NIMS is similar to the Irish Framework for Major Emergency Management as it provides a framework that cuts across all bureaucratic and governance scales to ensure that response is coordinated for all events. Further, it explains all responsibilities “of federal, state, and local governments and various first responder disciplines at each level during an emergency event”. NIMS is centred around two key concepts: “multi-agency coordination and unified command” (DHS, 2013:3 and MA-CEMP, 2017). These concepts are essential to the development of emergency management policy as they call for one “set of objectives”, a “collective response”, better knowledge sharing and “coordination”, recognising agency command and objectives, and ensuring all agencies are legally safe, recognised and positively utilised within one plan (DHS, 2013:3/4).

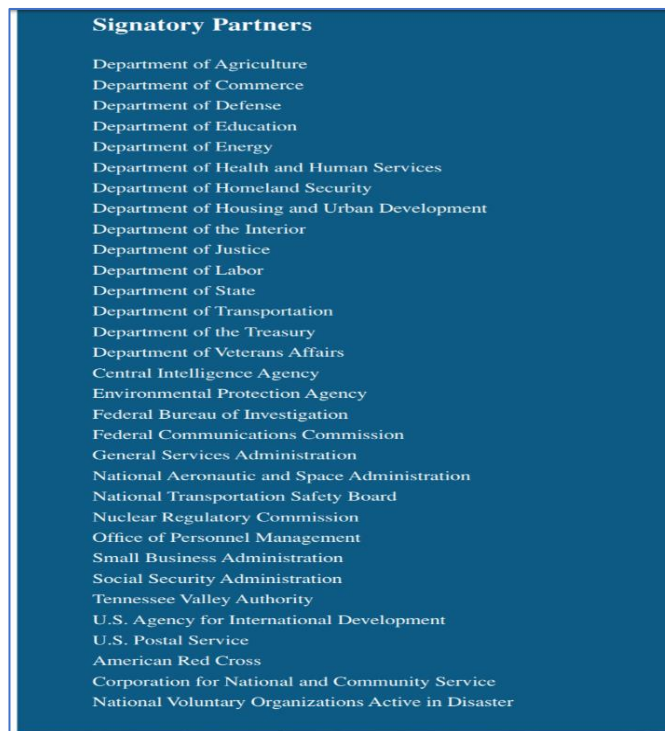
The development of NIMS led to the evolution of the Incident Command System (ICS) as a standardized organizational system for the command and coordination of emergency response, which is utilized at each jurisdictional scale (MA-CEMP, 2017:6). The Incident Command System is used worldwide, including in Ireland (DoHPLG, 2016). The US system has “five functional areas—command, operations, planning, logistics, and finance/administration—for management of all major incidents (FEMA, 2008:1)”, with the Irish plan differing slightly in its remit with four major areas – command, control, communications and information management. Both systems also describe the importance of preparedness and training before incidents occur.

Secondly, the Act required that the Department of Homeland Security develop a National Response Plan (NRP). This plan was enacted in 2004 and was underpinned by the all-hazards philosophy for the response to emergencies that needed federal help (GAO, 2006 and DHS, 2004). It was developed to be aligned with the DHS mission “of preventing terrorist attacks within the United States; reducing the vulnerability to all natural and man-made hazards; and minimizing the damage and assisting in the recovery from any type of incident that occurs” (DHS, 2004; np). The full policy is unavailable to the public, but a brochure with the key points appears to be similar to the policy actions of the framework. The NRP refers to events of “national significance” as the only type of event the plan

applies to. “National Significance is defined as an actual or potential high-impact event that requires a coordinated and effective response by an appropriate combination of federal, state, local, tribal, nongovernmental, and/or private-sector entities in order to save lives and minimize damage and provide the basis for long-term community recovery and mitigation activities” (GAO, 2006: 6 and DHS, 2004, np). It was drafted by a series of agencies (see Figure 5.2), that cut across the above-mentioned scales (DHS, 2004).

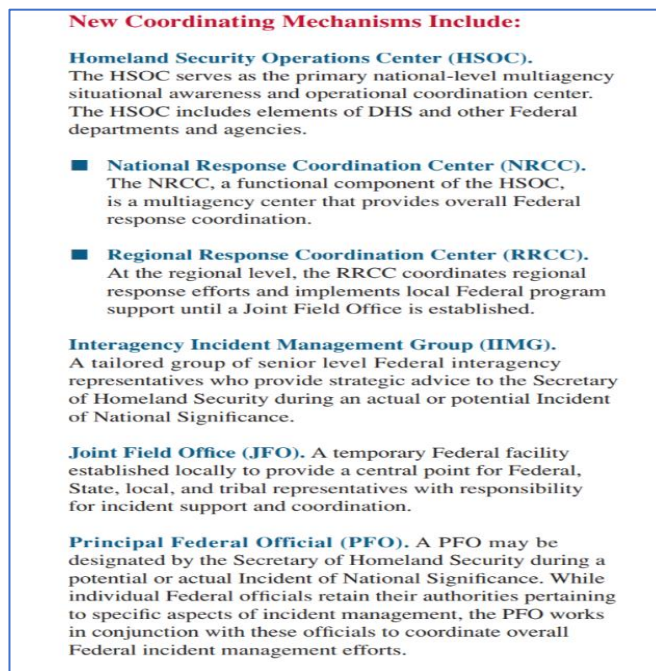
The NRP covers the four key areas of any major emergency plan - prevention, preparedness, response and recovery - but also places emphasis on the importance of a local response ensuring that even when federal assistance is required it is offered as on-site support and does not interfere with “existing plans under the planning assumption that incidents are typically managed at the lowest possible geographic, organizational, and jurisdictional level” (GAO, 2006: 6). The plan also creates a multi-agency vertical structure to assist in inter-agency and inter-governmental coordination that occurs simultaneously at different scales (Figure 5.3) and it created several new “coordination mechanisms” (np).

Figure 5.2: Partners of the NRP



Source: DHS (2004)

Figure 5.3: New Coordination Mechanisms

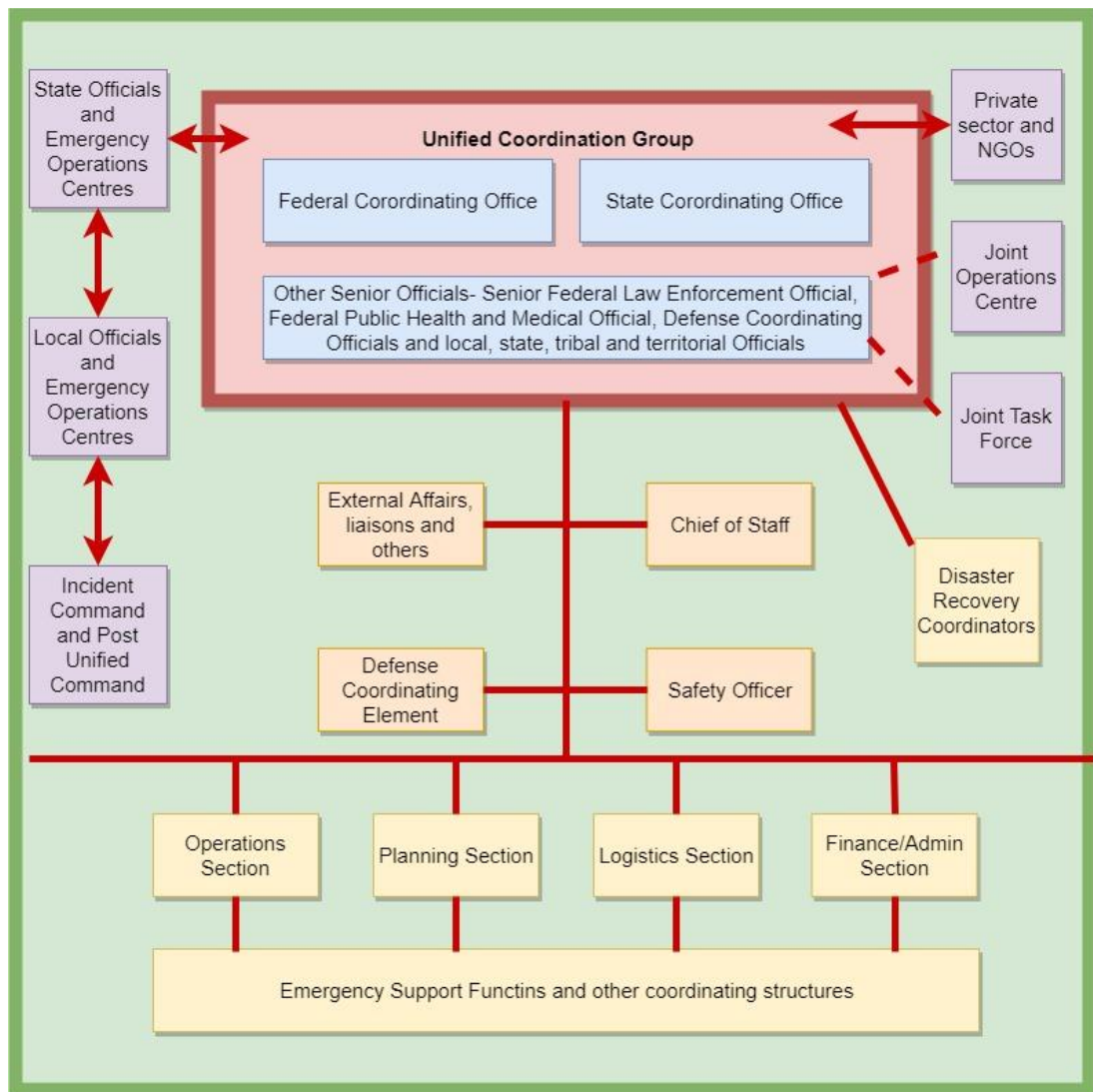


Source: DHS (2004)

The NRP was replaced by the National Response Framework (NRF) in 2008 with further editions in 2013 and 2016. It builds on NIMS and ICS which provide the standard command structure and it uses the same aim of coordinating across the differing jurisdictional scale as the NRP. It is part of the National Preparedness System and was initiated by the Presidential Policy Directive PPD-8: National Preparedness. PPD-8 aims to “strengthen the security and resilience of the United States through systematic preparation for the threats that pose the greatest risk to the security of the Nation” (DHS, 2013: 1). It supports five key areas as opposed to the four in the NRP - prevention, protection, mitigation, response and recovery - and is underpinned by five key principles (DHS, 2013:6):

1. “Engaged Partnership” – Officials at all scales collaborate to ensure no one scale is overcome by the extent of an incident. This is of particular noteworthiness due to the finding that agencies and resources were overwhelmed during Hurricane Katrina (GOA, 2006:6)
2. “Tiered Response” – Response should always begin at the local scale and only be escalated upwards when it is necessary.
3. “Scalable, flexible and adaptable operational capabilities” – This is to ensure that response and resources are adaptable as the incident changes or grows and meets the requirements set by NIMS/ICS .
4. “Unity of effort through unified command” – Under NIMS/ICS there is respect for each agency’s own command structure, and this is upheld in the NRF. This contributes rather than hinders both horizontal and vertical inter-agency and inter-governmental coordination with scales blurring within the unified command structure (see Figure 5.4).

Figure 5.4: Unified Coordination structure



Source: Author produced from DHS (2013:41)

5. “Readiness to act- Effective response requires a readiness to act that is balanced with an understanding of the risks and hazards responders face.”

Similarly, to the Irish Framework, the NRF has a series of guidance and protocol documents which support it known as annexes: Emergency Support Function (ESF) Annexes, Support Annexes and Incident Annexes. The NRF is also the first document to discuss federal assistance without enacting the Stafford Act. The normal manner to access federal resources is by following the procedures set out in the Stafford Act as explained earlier, but the NRF briefly discusses another



mechanism for declaring a federal emergency. This tends to be through a specific federal department in response to highly specific incidents (see Figure 5.5).

Figure 5.5: Examples of other federal authorities

Scenario	Department/Agency	Authorities
Agricultural and Food Incident	Department of Agriculture (USDA)	The Secretary of Agriculture has the authority to declare an <b>extraordinary emergency</b> and take action due to the presence of a pest or disease of livestock that threatens livestock in the United States. (7 U.S. Code § 8306 [2007]). The Secretary of Agriculture also has the authority to declare an <b>extraordinary emergency</b> and take action due to the presence of a plant pest or noxious weed whose presence threatens plants or plant products of the United States. (7 U.S. Code § 7715 [2007]).
Public Health Emergency <sup>20</sup>	Department of Health and Human Services	The Secretary of the Department of Health and Human Services has the authority to take actions to protect the public health and welfare, declare a <b>public health emergency</b> and to prepare for and respond to public health emergencies. (Public Health Service Act, 42 U.S. Code §§ 201 <i>et seq.</i> ).

Scenario	Department/Agency	Authorities
Oil and Hazardous Materials Spills	EPA or USCG	The EPA and USCG have the authority to take actions to respond to oil discharges and releases of hazardous substances, pollutants, and contaminants, including leading the response. (42 U.S. Code § 9601, <i>et seq.</i> , 33 U.S. Code § 1251 <i>et seq.</i> ) The EPA Administrator and Commandant of the USCG <sup>21</sup> may also classify an oil discharge as a <b>Spill of National Significance</b> and designate senior officials to participate in the response. (40 CFR § 300.323). <sup>22</sup>

*NOTE: These authorities may be exercised independently of, concurrently with, or become part of a Federal response coordinated by the Secretary of Homeland Security pursuant to Presidential directive.*

Source: DHS (2013:17/18)

However, the biggest change that occurred from the Homeland Security Act of 2002 was the formation of the Department of Homeland Security (DHS) in 2003. It was organised as a single, cabinet-level organisation and amalgamated 23 federal agencies including FEMA. As FEMA was absorbed into DHS it became part of the Emergency Preparedness and Response Directorate of DHS. During the process of absorption some of its responsibilities were initially re-organised and in 2005, the development of the Office of Preparedness further reduced FEMA’s responsibilities to a focus on response and recovery only. This development resulted in reverting back to the structural organisation that existed prior to FEMA’s development in 1979 as now Federal Emergency Management was once again decentralised across several offices and agencies (Haddow et al, 2016).

However, Hurricane Katrina proved to be a major turning point for the development and organisation of FEMA. Prior to Hurricane Katrina, FEMA had conducted evacuation exercise for New Orleans resulting in several recommendations, but as the DHS re-allocated funds to other priorities such as terrorism, the recommendations were never implemented. Thus, in 2006, the Administrations Report, “The Federal Response to Hurricane Katrina: Lessons Learned” and Hurricane Katrina’s GAO’s (Government Accountability Office) ‘Preliminary Observations Regarding Preparedness, Response, and Recovery’ testimony before the Senate, Homeland Security and Governmental Affairs Committee were released with the findings positively benefitting FEMA. The Administrators report developed from a series of “congressional hearings” involving “125 recommendations and 11 critical actions” that were to be completed before the “2006 hurricane season”. Meanwhile, the GAO testimony illustrated four major issues, two of which will be discussed. Firstly, as the response was similar to previous events, there is a need to “define and communicate leadership roles, responsibilities and lines of authority (Nd)”. This is an aspect that the Framework for Major Emergency Management does very well. There needs to be an understanding of how the National Response Plan is activated, training and planning need to be conducted and “response and recovery capabilities” (Nd) need to be developed. Secondly, FEMA’s response to Hurricane Katrina was weak and created concerns around its organizational placement. The GAO report recommended one of three options: its disbanding, remains within DHS, or becomes an independent agency. Further, changes that occurred out of the GAO testimony and the Administration’s Report were the President being assigned more power, the re-organization of FEMA, and the exact responsibilities of the DHS were clarified (FEMA, 2012 and Haddow et al, 2016). These changes were combined with six new pieces of legislations including ‘The Post-Katrina Emergency Management Reform Act of 2006 (PKEMRA)’ (Haddow et al, 2016).

Of all six new pieces of legislation, the PKEMRA affected FEMA and emergency management the most. FEMA was re-established as an agency under the Department of Homeland Security and provided with statutory authority which involved DHS re-organising emergency management functions as part of FEMA, which in turn provided FEMA with new forms of power and status within the

USEMA federal scale (FEMA, 2012 and Haddow et al, 2016). Further, even though FEMA remained under the DHS, some autonomy was provided with FEMA's administrator being granted communication powers with Congress as a form of protection to ensure organizational autonomy and from its focus being re-directed by DHS (FEMA, 2012 and Haddow et al, 2016). However, the administrator still reports to the Secretary of Homeland Security but oversees the enacting of the Stafford Act, the operation of the National Response Coordination Centre, and is generally in charge of overseeing the key points of emergency management (DHS, 2013).

As is the norm across the US, most federal departments have regional or field offices that work alongside state and local agencies. FEMA has 10 regional offices (see Figure 5.6) with each having a Regional Response Coordination Centre which oversee several states. During activation, they remain in communication with FEMA headquarters and begin the process of providing federal assistance until unified coordination is established (DHS, 2013) in response to a State's request for assistance.

Figure 5.6: FEMA Regions



Source: DHS (2013:42)

#### 5.4 State Scale

The State scale of emergency management acts as an intermediary between the active federal scale and powerful local scale. The State scale will be studied through the Massachusetts Emergency Management system. Massachusetts

emergency management is organised in a similar manner to that of the other 49 states and follows the directives and policies such as the NRF when organising and creating their own policy. As illustrated above, federal policy weakens the power of the federal scale but also the state scale by determining that all response begins at the local scale and is escalated from there. However, as Massachusetts is a home rule state, the control the state has at the local scale is further weakened.

Home rule is a form of self-governance applied to cities, towns and counties. Almost all states have some form of home rule provision but the degree to which it is applied varies. Massachusetts adopted a strong version of home rule in 1966 (relatively late in terms of other states) (Department of Revenue, 2017) allowing any city or town in the Commonwealth to determine their own laws through their own legislative body. Three participants explained it in relation to their own position and knowledge resulting in interesting perspectives, but all recognised the strength of it. Participant IDF, a researcher with the Harvard T.H. Chan School of Public Health, described its strength by comparing it to New York State and explained the complications for inter-jurisdictional governance which arise out of home rule.

“Massachusetts is a home rule state. New York is a home rule state, and I lived in New York for a long time and the comparison is stark because home rule means that local control is the primary factor in government. So, in Massachusetts, that means every town is self-governing and the state really has more of an overseeing role. But the primary place where decisions are made is at the town level. So, for Massachusetts, we have counties in Massachusetts, but they don't mean anything, so there is not a county government like there would be in Britain. So, New York says they are a home rule state, but New York has county government where the county executive is like the county mayor, as well as having the town system, so there is still a town system and there is a county system above it. Massachusetts doesn't have that county system so that is another thing in Massachusetts, if you had a strong county system you could do it based on counties. You could group things based on counties, although the city of Boston is a county so that wouldn't help the city of Boston, it would help

other parts of the state. But we don't have that, so it is kind of that extreme home rule dynamic in Massachusetts.”

Participant IDM an emergency management official with Boston City Hall describes home rule and the number of self-governance cities and towns that communicate with the state.

“That is one thing you should realise about Massachusetts, that it is a home rule state which essentially means that there is a lot of power within the local governments. Even though we have counties within Massachusetts, they don't serve a purpose in terms of some sort of governance structure within emergency management. So, there are 351 communities within Massachusetts and each one of those works directly with the State emergency management agency, there is no in between”.

Participant IDF explains it in terms of coordination between single authorities and how the strength of home rule actually creates an important role for the state, even a weakened state, in a management position.

“In Massachusetts, in the US in general, we don't have counties but if you had counties in a state, that would be like the biggest entity so it's the cities and towns, so we have what we call home rule, they are in charge, so Boston can do what they want, Cambridge can do what they want, Somerville can do what they want. Now, sure there has to be some sort of coordination there, so Somerville can't be telling people to evacuate to Boston and Boston is telling people to evacuate to Somerville that is not going to work”.

Participant IDF raises an interesting concern regarding the confusion that can develop from jurisdictional coordination especially in a state like Massachusetts where jurisdictions cover a relatively small geographical area in which it is easier for incidents to cross boundaries (see Appendix 7 for a map of Massachusetts Cities and Towns). For instance, the Boston metro area has 101 municipalities, while Massachusetts, in total, has 55 cities and 296 towns (MA-CEMP, 2017). All have their own laws, emergency services, and self-governance. However, participant IDF explains that the miscommunication that could occur between different jurisdictions is:

“managed through the state, you know, trying to monitor those messages, so MEMA, the state agency monitors what the locals are doing, making sure that that kind of thing isn’t happening. It is a lot more complicated than if the state could just come in and say this is what we are going to do. Other states can do that! Massachusetts, the way our local government is structured, the state does not have the authority to sort of tell local communities what to do”.

#### 5.4.1 Massachusetts Emergency Management Agency

MEMA is the Massachusetts Emergency Management Agency which coordinates federal, state and local agencies during crises. It was created by the Massachusetts Civil Defense Act of 1950 with the aim of planning and training for major disasters and to work with communities to develop their resilience and capacities (MA-CEMP, 2017) across the Commonwealth. Each state is federally required to have developed Comprehensive Emergency Management Plans (CEMP).

MEMA is responsible for the development of the Massachusetts plan ensuring it conforms to the requirements of NIMS and ICS by following the procedures developed by FEMA (MA-CEMP, 2017). CEMPs are essential frameworks for ensuring efficient coordination across scales and agency types, i.e. federal to local and emergency responders to voluntary organisations. By staying in tune with NIMS, CEMPs discuss in detail all phases of emergency management as discussed at the federal scale: “prevention and mitigation, preparedness, response and recovery” (2-2/2-3) and the flexibility of ICS allows Massachusetts to apply it to its own circumstances thus, ensuring efficient coordination of resources and agencies during times of emergency. The CEMP can be activated by the Governor or any other authorized individual if a “Gubernatorial State of Emergency” (3-12) has been declared by the Governor for specific areas or vast areas of the Commonwealth or a Presidential declaration has been attained. The Presidential declaration must be requested by the governor through the FEMA Region 1 administrator.

When an emergency has been declared the State Emergency Operations Centre (SEOC) is activated as a Command and Control Centre. The SEOC operates on a day-to-day basis to monitor emergencies across the state (see Figure 5.7). If the CEMP is activated, then the MEMA director retains responsibility for determining

the appropriate declaration. These activations can either be in response to an emergency or planned events such as July 4th or the Boston Marathon.

Figure 5.7: Activation levels

SEOC Activation Level	Definition
<b>1</b> STEADY STATE / MONITORING	<b>Steady State / Monitoring:</b> MEMA is operating with normal 24/7 staffing. The Director, Response and Field Services Section Chief, Operations Duty Officer, Regional Managers, and MEMA Communications Center are monitoring conditions and events throughout the state and region, and staff is available to assist municipalities and state agencies if the need arises.
<b>2</b> PARTIAL	<b>Partial Activation:</b> Additional staff is on duty in the SEOC. Some General and Command Staff positions have been filled and some Emergency Support Functions have been activated. Enhanced operations and planning activities are taking place.  MEMA anticipates limited requests from municipalities and state agencies and that state resources and capabilities will not be exhausted. A need for federal or interstate support is not anticipated.
<b>3</b> FULL	<b>Full Activation:</b> The SEOC is fully operational. All General and Command Staff positions have been filled and most or all Emergency Support Functions have been activated. A FEMA State Liaison Officer or IMAT may be present in the SEOC and the FEMA Region 1 RRCC may be activated.  The Governor has declared or is likely to declare a state of emergency and has requested, or is likely to request, a federal emergency or major disaster declaration.  MEMA anticipates numerous requests for support from municipalities, agencies, and organizations. Resource requests may exceed state capabilities; state-to-state mutual aid via EMAC, state to state/province mutual aid via IEMAC, and/or federal assistance is anticipated.

Source: MA-CEMP (2017)

The SEOC is organised and activated to support local ‘Emergency Operation Centres’ (EOCs) and to ensure that local responders have the resources to deal with the emergency (NRF). In order to achieve this type of working relationship and inter-agency coordination, the state structures must adequately integrate into the local incident command structures. These relationships are developed through three mechanisms: Regional EOCs, WebEOC and Emergency Support Functions (ESFs). Firstly, MEMA has three regional offices across the Commonwealth which act as primary contact points for local areas and share information from the Regional EOCs back up to the SEOC. This on-site information is critical in decision-making and resource allocation. These regional EOC’s are often working alongside the local EOCs in a manner that the SEOC would find difficult or timely at the beginning of an event.

Secondly, WebEOC is an online emergency operations centre and crisis management system which supports the “ICS method of response management for significant incidents, in addition to providing a unique toolset for supporting daily operations in the regional response centres” (EPA, 2019), the SEOC, local EOCs and individual agencies.. It is described by the Capital Area Council of Governments (CAPCOG) (2019) as a

“communications and response tool for emergency management coordinators and first responders. As a tool, it allows emergency management personnel to provide and view information about incidents. WebEOC lets agencies track the allocation of local resources regionally to improve response to disasters and terroristic threats. It also allows other emergency centric institutions — such as hospitals, health departments, and various city departments — to be alert of situations and prepare their own response” (edited for conciseness).

Thus, WebEOC can be imagined as a type of Facebook for emergency response where real-time information and necessary data is shared between response agencies. This is supported through map functions, different types of plugins and noticeboards which replace the paper or whiteboard type noticeboard which historically had been used by emergency response centres worldwide (Intermedix, 2013) and are still being used in Ireland. Further, the type of plugins, maps and boards can be changed to represent the need of each local area and state and everything is time stamped and meta-data is collected in relation to the user, agency, location, edits etc.

Thirdly, the Massachusetts Emergency Support Function teams (MAESF) are essential for ensuring coordination. There are 16 teams consisting of trained individuals for a range of agencies and jurisdictional scales. Each ESF is in charge of one broad element of an emergency and the MEMA director will designate who is the lead for each aspect during an activation. (see Appendix 8 for the list of MAESFs).

Finally, the CEMP plan provides information for the planning, training and review of emergencies. However, one of the critical aspects of the 2017 plan, was the application of the Threat and Hazard Identification and Risk Assessment (THIRA) which produced several different potential risks for the Commonwealth (see Figure 5.8). This was a multi-agency and multi-jurisdictional project that built upon the federal THIRA, thus ensuring coordination was part of the planning process and not just the response phase. However, conducting a project of this nature helps the CEMP plan to be more focused on actual threats and allows for training exercises either agency specific or inter-agency to be more tailored to the actual emergencies they may face. The CEMP plan builds upon the all-hazards



approach as dictated by the federal government, but the application of THIRA also reduces the planning for potential events and ensures that both broad and specific plans can be written and trained. Broad plans are in line with the all-hazards approach and can be applied to any situation. The specific plans can be based on the outcomes of the THIRA to ensure knowledge, training and coordination are as efficient as possible before an actual event.

Figure 5.8: THIRA hazards

<b>Natural Hazards</b>	<ul style="list-style-type: none"> <li>Drought</li> <li>Earthquake</li> <li>Flood</li> <li>Hurricanes</li> <li>Ice Jams</li> <li>Ice Storms</li> <li>Landslides</li> <li>Public Health Hazards (Epidemic, Pandemic)</li> <li>Severe Nor'Easter</li> <li>Severe Winter Event</li> <li>Thunderstorms</li> <li>Tornado</li> <li>Tropical Storm</li> <li>Wind Storms</li> </ul>
<b>Technological Hazards</b>	<ul style="list-style-type: none"> <li>Blackout</li> <li>Bridge Failure</li> <li>Commodity Shortage</li> <li>Dam Failure</li> <li>Nuclear Power Station - Radiological Release</li> <li>Transportation Accidents</li> </ul>
<b>Terrorism Scenarios</b>	<ul style="list-style-type: none"> <li>Active Shooter</li> <li>Biological Weapon</li> <li>Chemical Weapon</li> <li>Cyber Attack - Data</li> <li>Cyber Attack - Infrastructure</li> <li>Explosive Device</li> <li>Radiological Device</li> </ul>

Source: MA-CEMP (2017)

Although the MA-CEMP is quite detailed, it is relatively black and white, and presents the state response system in its most perfect structure. However, the reality of emergencies and who actually sits in EOCs or what these agencies actually are, was revealed through two key participant interviews. Participant IDG

describes the activation of MEMA, who sits in the State EOC and their role as a coordinating agency for the local scale.

“MEMA stands up their operations centre at whatever at partial activation all the way up to a full, most other municipality in the impacted area would stay at the same level. [...] In those EOCs you would find all those different agencies, Boston invites the Red Cross in and other outside partners, MEMA, for the state, they do the same, the Salvation Army. They have the State Police in there, the Department of Conservation which is like the Park Rangers and environmental protection for the state so those EOCs they do that, it is true multi-agency coordination, it is not just representatives from the agencies that those EOCs are for, they bring in outside groups. [...] So, the support and FEMA is a coordinating agency, the same thing with MEMA they consider themselves coordinating agencies they are not, while people, while the public might view them as a response agency, their main job is to get the people that are out on the ground doing the work, mainly that is folks from the local and individual communities that are impacted, the state and the federal systems are there to make sure they have the resources that they need to respond to the disaster or emergency basically”.

Participant IDC of a volunteer organisation describes the organisation of MEMA’s EOC.

“So, anytime something happens we have the bunker in Birmingham, Massachusetts, it is the MEMA Bunker, [...] So there is a bunch of different desks there and they are all manned by different non-profit agencies, different agencies all come together, and they man the phone lines. So, if something ever happens and you are getting calls in there you can direct people to the resources they need to go to”.

What is evident, throughout this section and from the participants, is the importance and power of the local scale for the activation of the state scale and yet, as will be seen in the next section, the local scale depends on the state and federal scale for the organisation of their policy. Thus, there is a symbiotic relationship between all the scales.

## 5.5 Local Scale

FEMA and MEMA are coordinating agencies that help the local scale to deal with any emergencies that may arise. This section will explore the City of Boston, the capital city of Massachusetts and home to 673,184 residents (US Census Bureau, 2016) with a landmass area of 231 km<sup>2</sup> (Open Data Network, 2016) and just one of 101 municipalities that make up the Boston Metro Area.

Emergency Management in the US is local first and must be scaled upwards through the appropriate channels. Local emergency plans and departments are built on the foundation of the federal procedure and policy in order to ensure funding streams. This presents a positive consequence at the local scale as the community becomes a focus alongside policy writing, hazard identification and training. By exploring Boston's Office of Emergency Management's (OEM) website, it became obvious that the target audience was the general population as it involved short blurbs, clear instructions, vital information and user information. This differs from the Office of Emergency Management's website or the MEM website in Ireland which provides some general information, but mostly requires searching through long and difficult policy documents to find any relevant information. The only exception is the "Be Winter Ready" website which is exactly like Boston's OEM website just more restricted in the hazards it covers.

The Massachusetts Civil Defense Act of 1950 legislated that each municipality required an emergency management program and a person to oversee such. Boston's OEM, a department of City Hall (the elected governing body), meets that requirement and works closely with local responding agencies: Boston Emergency Medical Services (EMS), Boston Fire Department, Boston Police Department, Boston Public Health Commission, MEMA and various private bodies and volunteer organisations. However, Boston's OEM developed after 9/11, as historically one first responder agency held the office of emergency management, which is a structure still seen across Massachusetts as Participant IDM discusses

"So, for Boston emergency management, this office specifically existed after the September 11th attacks and came out of the urban area security initiative because we were receiving grant funding and then when we hosted the DNC [Democratic National Convention] there was a lot that had to happen for that.

Now emergency management used to be and its inception under fire, but we quickly realised that because there are various functions as well and emergency management is really about the coordination piece of police, fire, EMS, public health, all the different functional areas that it became its own office. [...] I think we are one of two communities out of the 351 in Massachusetts that has a full-time emergency management director. Most of them are part-time or it is part of another job. So even within the metro Boston homeland security region, the emergency manager is also the fire chief or the police chief. You are going to find that across the Commonwealth, across the country, a lot of it falls under police or fire.”

The MA-CEMP also requires every municipality to have their own EOC in which actions can be coordinated across all phases and inter-agency and inter-governmental coordination can be handled appropriately. Boston’s OEM oversees the Boston EOC which coordinates with Regional EOCs (REOC) and eventually the SEOC if required.

“So, our emergency management office really coordinates that entire process and we are the conduit for having the representatives in the EOC provide information from their departments and their operational elements and then pushing that information up and common operating picture, situational awareness, up to the Mayor's office and getting them all the information”.  
(Participant IDM).

However, Boston is slightly different as discussed by participant ID: “Now Boston being as big as it is, there are times when we will interact directly with FEMA, but we usually always let the State know about it”. This means that communication between the local and federal scale can, and does, occur by circumnavigating the established channels. In Boston, the Mayor has the authority to declare a state of local emergency so that citizens can begin preparing (MA-CEMP, 2017: 4-19) while, the city will utilize its own resources and agencies initially, with the potential of activating the “community-to-community mutual aid” (MA-CEMP, 2017: 1-9) programmes which helps a city like Boston overcome jurisdictional issues and attain resources quickly. City Hall and the OEM will only request state or federal help if all local resources have been exhausted or the situation is

overwhelming for the agencies, personnel and resources. The SEOC being enacted helps distribute resources to the scene and is the first step in moving towards federal aid, if it is required. If the state and local resources both become overwhelmed or exhausted then the governor will request a presidential declaration at any time post the event for 30 days (MA-CEMP, 2017).

“So, then the local government puts a request into the State who then puts it into the Federal Government. So, if it reaches a certain threshold then we can enact what is called the Stafford Act. And that basically means that the Federal Government can come in with additional resources to fit circumstances of the incident”. (Participant IDA)

As discussed earlier, the coordination and handling of emergencies are easier and more efficient when potential hazards and risks have been identified but at the local scale, it is not a federal requirement to undertake any such task. However, the Federal Disaster Mitigation Act of 2000, restricts FEMA funding for municipalities who do not engage in hazard and risk identification and mitigation plans every five years (CoBNHMP, 2014). In the 2014, “City of Boston Natural Hazards Mitigation Plan” the risks were identified (see Figure 5.9) but the definitions of the likelihood of these events as defined in Figure 5.10 were taken from the Massachusetts Hazard Mitigation Plan of 2010 as no new data was available. The natural risks that are most likely to have the highest consequences are mainly weather based events, with flooding being likely with a medium impact. However, I propose that flooding is now highly likely with high consequences as is evident from the figures of Quincy, MA (a city which neighbours Boston) and Boston Harbour in March 2018 and from participant IDB who stated:

“I think that coastal flooding is seen as more of that big issue that people might be aware of but there are definitely huge problems with our existing infrastructure and storm water management infrastructure is very old”.

Finally, this plan is specifically about natural hazards and is the only plan accessible on the OEM website. Most likely, there is an equivalent for human-made disasters but this unavailable.

Figure 5.9: Identified Hazard

<b>Table 9 - Hazard Risks Summary</b>			
<b>Hazard Type</b>	<b>Probability</b>	<b>Consequence</b>	<b>Hazard Rating</b>
<b>Flooding</b>			
<i>Inland/Riverine</i>	Possible	Critical	High (8)
<i>Coastal Storms/Storm Surge</i>	Unlikely	Critical	Medium (7)
<i>Urban Flooding</i>	Likely	Limited	Medium (7)
<i>Dam Failure</i>	Unlikely	Limited	Low (3)
<b>Wind</b>			
<i>Hurricanes</i>	Possible	Critical	High (8)
<i>Tornados</i>	Possible	Critical	High (8)
<i>-Nor'easters</i>	Highly Likely	Limited	Medium (6)
<i>-Thunderstorms</i>	Highly Likely	Limited	Medium (6)
<b>Winter Storms</b>			
<i>Severe Winter Storm</i>	Likely	Limited	Medium (7)
<b>Geologic</b>			
<i>Earthquakes</i>	Unlikely	Catastrophic	High (9)
<i>Landslides</i>	Possible	Minor	Low (3)
<i>Tsunami</i>	Unlikely	Critical	Medium (4)
<b>Other Natural Hazards</b>			
<i>Fire / Conflagration</i>	Possible	Critical	High (8)
<i>Extreme Temperatures</i>	Highly Likely	Minor	Medium (6)

Source: (CoBNHMP, 2014:25).

Figure 5.10: Definitions for reading

<b>Table 10 - Hazard Rating Assessment used in the Boston HIRA Report</b>		
Probability (Weight x1)*		Average Frequency*
Ratings	Definitions	
Highly Likely (4)	Event expected to occur at least once within the next year.	On average, this event occurs once a year or more frequently.
Likely (3)	Event expected to occur at least once within the next 1-3 years.	On average, this event occurs at least once every 3 years, but less often than once a year.
Possible (2)	Event expected to occur at least once within the next 3-10 years.	On average, this event occurs at least once every 10 years, but less often than once every 3 years.
Unlikely (1)	Event expected to occur at least once within the next 11-100 years.	On average, this event occurs at least once every 100 years, but less often than once every 10 years.
Consequence (Weight x2)		
Ratings	Definitions	
Catastrophic (4)	Mass fatalities OR basic life services disrupted for up to 30 days OR more than 50% of property severely damaged.	
Critical (3)	Multiple fatalities and severe injuries OR basic life services disrupted for up to 2 weeks OR more than 25% of property severely damaged.	
Limited (2)	Some injuries OR basic life services disrupted for up to one week OR more than 10% of property severely damaged.	
Minor (1)	Minor injuries OR basic life services disrupted for 72 hours or less OR less than 10% of property severely damaged.	

\*The probabilities and averages used in this table are not always based on extensive data, but in some cases reflect the collective judgment of emergency responders. Source: Boston HIRA

Source: (CoBNHMP, 2014:26)

Figure 5.11: Coastal Flooding in Hough’s Neck, Quincy MA March 2nd, 2018.



Source: Byrne, A (2018) via Facebook.

Figure 5.12: Coastal Flooding in Hough's Neck, Quincy MA March 2nd, 2018.



Source: Byrne, A (2018) via Facebook.

Figure 5.13: Coastal Flooding in Hough's Neck, Quincy MA March 2nd, 2018



Source: Byrne, A (2018) via Facebook.



Figure 5.14: Coastal Flooding at Boston Harbour MA March 2nd, 2018.



Source: 7 News-WHPN Boston via Facebook Live.

Figure 5.15: Coastal Flooding at Boston Harbour MA March 2nd, 2018.



Source: 7 News-WHPN Boston via Facebook Live.

Figures 5.11 to 5.15 illustrate the potential for flooding in the Boston region with the hazard identification list illustrating the vast range of natural hazards that may affect the region creating difficulties for citizens to prepare and

respond effectively. Boston’s OEM has one public plan in place, “Ready Boston”, which would have contributed to the population being prepared for the above event and others. This is a city-wide community emergency preparedness plan which according to OEM (2016) “educates and empowers Bostonians about the hazards they may face” and encourages preparation. It is developed under FEMA’s Ready America Plan and both focus on the all-hazards approach thus, shifting away from the publicly available natural hazards plan towards an acceptance that the population needs to be prepared for all types of events. It is simple in its development and requests of people by asking that the population take part in 3 steps. First, have a plan. Second, have a kit and go-bag and finally be informed about your risk. It also informs the public of the alert system that can provide information to the public via text and provides access to evacuation plans (see Figure 5.16).

Figure 5.16: Text alert regarding extreme weather June 29th 2018



Source: Leddy, M (Private message)

This system was supported by Participant IDC, a member of a volunteer agency with a research component, who explained the value behind such simple requests and the questions they use to make vulnerable communities realise their need to achieve these steps.

“They are very basic; it is three steps. Stay informed, make a plan, build a kit. So, it is staying informed, what are your local hazards, and what would you do if there was a tornado versus a hurricane? I mean there aren't any here but if a winter storm hits what are you going to do? And then making a plan, just making sure you have contacts in the city and outside of the city to call. So, if phone lines get really mashed up during any emergencies, so basically telling people to send a text if you can, if you can get to your friend down the street, call your family in a different state, call your friend in a different state or across the US and then making sure that you and your family have a meeting place, designated beforehand. If something were to happen somewhere else, where would you meet? Down the street or a neighbourhood meeting place a little bit further out. Just so if you can't get in contact you at least know where to go”. (Participant IDC).

Boston is facing a range of crises, but it benefits from excellent emergency services, great coordination and the ability to work alongside both state and federal scales. Further, Boston's location neighbouring other cities, results in a higher level of resources and staff before they must escalate upwards. This is summed up by participant IDC

“I mean we had the marathon bombing in 2013 and there was so much cooperation, everybody just... What did they call it? Swarm intelligence. Everybody did what they had to do without really communicating why they did it, but it just worked so well.”

#### 5.6 USEMA Activation: Case study 2: United States- Boston Marathon Bombing April 15th, 2013

At the 117th Boston Marathon, two homemade improvised explosive devices (IEDs) were detonated on Boylston Street in two separate locations near the finish line killing three and wounding 264 people. It resulted in a week-long inter-agency and inter-jurisdictional response resulting in the death of one suspect and the arrest of the second. This section will give an overview of the key events as outlined in detail by the After-Action Report (AAR, 2014) and briefly discussed in the House Homeland Security Committee Report (HHSCR, 2014). This timeline is to give a brief introduction of the attack and response, so it will appear

plotted, but the gaps will be filled during later discussions on inter-agency coordination in this chapter.

#### Monday 15th

The Boston Marathon began at 9am with the final runners setting off at 10.40am resulting in some 27,000 runners on the course by 11am and the elite runners finishing at 12.36pm. The Red Sox game begins in Fenway in Kenmore Square which is part of the marathon route. At 2.08pm the Red Sox game ends and at 2.24pm, course medical stations between 1 and 8 are closed. Then at 2.49pm, the first bomb detonates in front of 671 Boylston street, with the second bomb detonating 180 yards away at 755 Boylston street 13 seconds later (ARR, 2014).

#### Wednesday 17th

As a result of public requests, the FBI begin acquiring numerous photos and videos from the public of the attack and potential suspects.

#### Thursday 18th

At 10.28pm an armed robbery occurs at a store in Cambridge, a neighbouring city of Boston. Then at 10.31pm, an MIT Police officer is fatally shot while sitting in his cruiser. It is suggested that these attacks are linked and a BOLO (Be on the Lookout) is declared. Then at 11.20pm, an SUV is carjacked.

#### Friday 19th

At 12.19am Cambridge Police Department receives a 911 call from the victim of the SUV carjacking after he escapes. After about twenty minutes of police interviews, the victim says he recognises the carjackers from the Boston Marathon Bombing and that his SUV has a Manufactured Tracking system (ARR, 2014).

At 12.41am, the tracking system locates the vehicle in Watertown and an officer of Watertown Police Department (PD) begins following it but is told to hold back by superior officers until they arrive. As the SUV travels the officer remains behind it and another vehicle, a Honda Civic, at a distance until the SUV stops and the suspect exits and begins walking towards the officer's cruiser shooting. At this point, the officer's supervisor arrives, and the suspect begins shooting at him, barely missing the officer as he shot through the windscreen. At this point, the

second suspect emerges from the Honda Civic and begins throwing homemade IEDs at the officers.

At 12.44am, “shots fired” is relayed via radio to other police departments to respond. BPD, Cambridge PD, Transit PD, Massachusetts State Police (MSP) and nearby communities respond with several hundred officers arriving as the suspects continue the shootout and throwing IEDs and a pressure cooker bomb at the officers (ARR, 2014).

At 12.49am the first suspect is tackled by officers and is struck by the vehicle of the second suspect as he flees the scene. The first suspect is arrested and brought to a hospital. The second suspect flees while shooting and wounding an Massachusetts Bay Transport Agency (MBTA) Transit Officer. He drives half a mile before abandoning the car and fleeing on foot.

At 12.56am several areas of Watertown are restricted, and a larger perimeter is set up for a comprehensive grid search, which is not completed until 6 pm. At 1.06am the first suspect is pronounced dead in hospital, but his fingerprints are used to identify him and his younger brother as the second suspect. Thus, at 2.05am the FBI releases clear front facing photos of the suspects (ARR, 2014).

At 7.15am a suspicious person carrying a package is reported to have been picked up by a taxi driver and dropped at South Station, it was suggested that the passenger then boarded a Amtrak train. The report was taken seriously due to the taxi driver being of middle eastern characteristics and appearing on the federal terrorist watchlist. The report does not explain what made the taxi passenger suspicious. As a result, South Station was locked down, the taxi driver was questioned and an Amtrak train in Norwalk, Connecticut which departed from South Station was searched for the passenger. At 9am, it was determined that no suspect was found on the train and that the taxi driver was innocent as his name had been misspelt, and he did not appear on the watchlist.

At 6.42pm, Watertown PD receives a 911 call from a member of the public stating that an injured individual is in his parked and tarped boat. Multiple police units respond with officers shooting at the boat at 6.54pm until a superior

officer orders a ceasefire and movement under the tarp is noted at 7.05pm (ARR, 2014).

At 7.43pm tactical decisions are made to deploy flashbangs in the boat to lure the suspect out but at 7.46pm no suspect emerges. At 8.02pm, the FBI Hostage Response Team is deployed alongside the “MSP Special Tactical Operations Team who deploy a Bearcat armoured vehicle with an armoured arm to pull back the tarp” (ARR, 2014:32). The suspect does not engage with hostage negotiators straight away but at 8.41pm he emerges from the boat and is arrested and brought to a hospital. This ends the response portion of the Boston Marathon with the following days being about recovery, community resilience and grief.

### 5.7 Inter-agency Coordination During and Post the Boston Marathon Bombing.

The response to severe weather events and terrorist events notably changes the shape of an assemblage in differing ways as the response must cater for different eventualities and circumstances and yet, both emergency management systems responded to their individual events using the all-hazards approach.

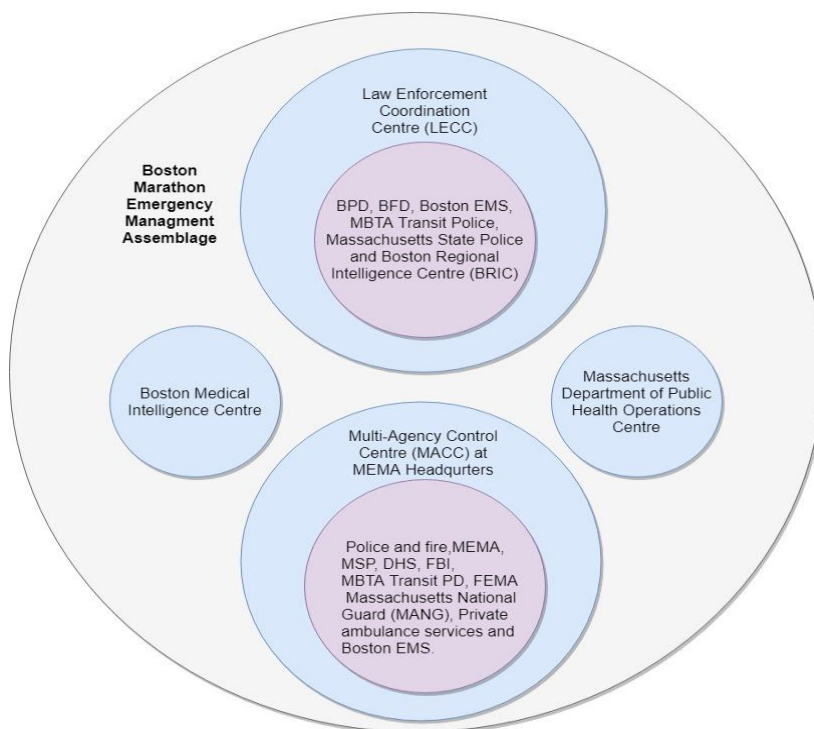
Both the Irish and US events required national input but did so in very different ways based on policy, need and preparation and both came from very different positions. Ireland was given warning of the impending storms and was able to prepare whereas Boston had no warning about the attack, but due to the marathon certain response procedures, the SEOC and medical tents were already in place, which helped to create a quicker and more efficient response ensuring that anyone who made it to hospital survived (AAR, 2014). “So, the marathon is kind of an interesting phenomenon in that the marathon is kind of treated as a planned disaster” (Participant IDF).

Even so, this was a prolonged event that shifted the assemblage from a very clear procedurally hierarchical shape to a misshaped, messy simultaneously hierarchical and flat assemblage where the lines blurred. Roles and responsibilities become confused as inter-agency coordination weakened, as power splintered everywhere and bounced between agencies, scales and jurisdictions.

The After-Action report (2014) identified a series of issues with coordination, which all contributed to the illustration of a messy structured and

continually changing assemblage emerging during the crisis, even when procedures were already partially activated. Figures 5.17 to 5.19 represent the changes in the assemblage shape as the event unfolded over the week. The power networks could not adequately be drawn but are very much present and accountable for the continually changing shape.

Figure 5.17: Stage 1- Boston Marathon Emergency Management Assemblage-pre-planned



Source: Information retained from the After-Action Report (2014).

Figure 5.17 illustrates the pre-planned assemblage for the Boston Marathon as per the After-Action Report (2014). There were several control centres around the city and state which activated from 7 am on Monday the 15th. Notably, Boston Emergency Operation Centre was not open, instead multi-agency coordination occurred in the MEMA headquarters in Framingham located an hour outside of Boston. The Multi-Agency Coordination Centre (MACC) was:

“staffed with more than 80 personnel representing Police and Fire Departments from Hopkinton, Ashland, Framingham, Natick, Wellesley, Newton, Brookline and Boston, MEMA, MSP, MBTA Transit PD, Commonwealth Fusion Centre (CFC), Massachusetts Department of Fire

Services (DFS), Massachusetts Department of Transportation (Mass DOT), Massachusetts Department of Public Health (MDPH), Office of Emergency Medical Services (OEMS), Massachusetts National Guard (MANG), Office of Technology and Information Services (OTIS), American Red Cross (ARC), AMR Ambulance, Cataldo Ambulance, Fallon Ambulance, Boston EMS, the Boston Athletic Association (BAA), the US Department of Homeland Security (DHS), the Federal Bureau of Investigation (FBI), the Federal Aviation Administration (FAA), the Federal Emergency Management Agency (FEMA), the National Weather Service, and Amateur Radio.” (ARR, 2014:19).

Locally within Boston, the Law Enforcement Coordination Centre (LECC) was based at Boston Police Department (BPD) headquarters with representatives of

“BPD command staff, Boston Fire Department (BFD), Boston Emergency Medical Services (Boston EMS), Massachusetts Bay Transit Authority (MBTA) Transit Police (Transit PD), Massachusetts State Police (MSP), and Boston Regional Intelligence Centre (BRIC).” (ARR, 2014:19).

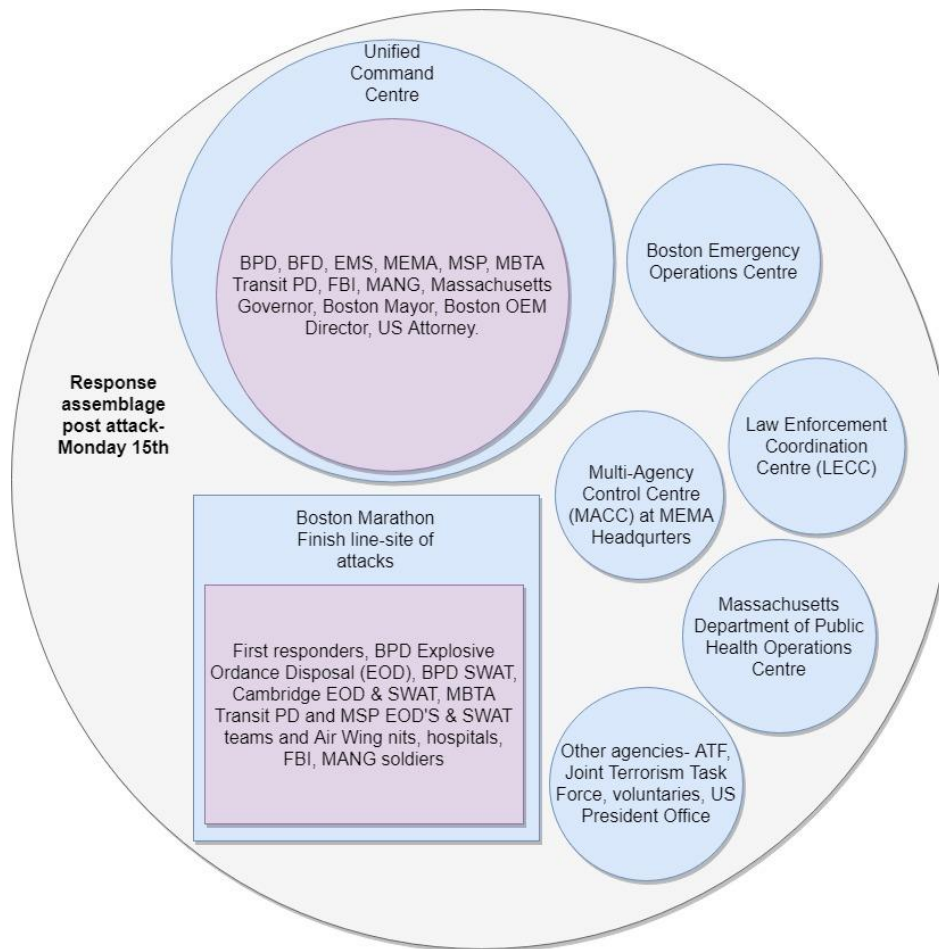
These two control centres were the focus of inter-agency coordination, but there is a clear scalar and jurisdictional separation between them. The MACC is the location for federal and state agencies and response agencies from different towns and cities affected by the marathon, including Boston, as discussed by participant IDM, while health functions are supported by the Massachusetts Department of Public Health Operations Centre.

“For some of the larger scale activations which are the planned events, the State is involved as well, so MEMA will have a rep here. The Marathon is the one time that we will also send a rep to their location because the marathon goes through, I can't remember how many communities, but every community is based at MEMA and then they will also have someone at our operations centre. So, we work with them for bad weather, larger events, but there is constant interaction between our agencies.” (Participant IDM).



The LECC primarily consists of agencies based in Boston with the exception of the MSP and MBTA, which are agencies with a broader jurisdictional governance. This distinction is in line with the Stafford Act (1988), DHS (2013) and MA-CEMP (2017), where a response is local first and escalated upwards through the pre-determined channels if deemed necessary. The activation of the state scale prior to the marathon, is due to the scale and inter-jurisdictional character of the event. The activation of both the MACC and LECC is evidence of power bouncing as issues along the course are dealt with by different centres of the assemblage based on the geographical location of such thus, suggesting that the assemblage is theoretically, and via policy, a hierarchy with the MACC being senior (MA-CEMP, 2017, DHS, 2013) to the LECC. However, the local scale via policy (Stafford Act, 2018, MA-CEMP, 2017) retains full autonomy and power while also ensuring that the MACC is activated to help with the marathon thus, relinquishing some control and power resulting in power shifting and bouncing between the two centres. Therefore, this assemblage, is in practice, flat but in theory hierarchical, so it oscillates between the two ontological assumptions discussed by Brenner et al, (2011) and McFarlane (2011a&b) and within this shifting and oscillation some agencies, or aspects of the assemblage, are positioned in the middle moving positions as required. For instance, the medical control centres are neither flat nor hierarchical they support the health aspect of the marathon only and are not inter-disciplined like the MACC or LECC so, depending on the issue and relationships between the centres the medical control centres can oscillate positions in order to be able to efficiently respond.

Figure 5.18: Stage 2 - Response assemblage post attack-Monday 15th



Source: Information retained from the After-Action Report (2014).

Figure 5.18 illustrates the change in the shape of the assemblage post attack on Monday 15th. The Figure is a clear depiction of the assemblage, but it does not show the power dynamics and aspects of a weak inter-agency coordination which hindered the response. Firstly, Boston Emergency Operations Centre activated 30 minutes after the attack, delaying the use of WebEOC for the sharing of information to other agencies within Boston and across the state and it incurred an even longer delay in receiving staff. The importance of the WebEOC for the marathon is illustrated by participant IDM.

“So, for the marathon, we have the marathon route within the map, we have the exact location of all the assets and where they are staged, and then you have all the CAD (Computer Aided Dispatch ) calls coming in and then you have where the WebEOC posts. And we have 311 within the city of Boston. We also have all the 311 calls being mapped.” (Participant, IDM).

The ARR (2014) has recommended that the Boston EOC is always activated for the marathon going forward in order to help with inter-agency coordination and jurisdictional issues. Both the MACC and LECC and Massachusetts Department of Public Health Operations Centre remained active while a Unified Command Centre (UCC) was organised for senior officials of key agencies of all jurisdictional scales. For example, Boston OEM, MEMA and FBI were all present. The development of so many operations centres caused confusion with agencies who were unsure of the tasks they were responsible for (ARR, 2014) as there was no clear hierarchy or command structure (ARR, 2014). This illustrates the beginning of a messy assemblage consisting of several centres of operations all lacking efficient communication and, thus, weakening coordination between agencies, jurisdictions and scales. Further, lack of preparation in identifying the location for the UCC beforehand, created unnecessary tensions and stress searching for an appropriate and well-equipped location after the event had unfolded. This lack of preparation resulted in the UCC needing to request that mobile communications operators ensure that mobile infrastructure covers the UCC as the infrastructure had collapsed under the pressure of the lines post attack (ARR, 2014).

“So, during the marathon, the phone system was overloaded but we could still text, data still went” (Participant IDD)

“I do recall it during the Boston marathon bombings and trying to call anyone here the phone lines just weren't functioning. People started spreading rumours, they shut it down. We didn't shut it down; the capacity isn't there.” (Participant IDC)

“During the marathon bombing it was difficult to communicate across all agencies as the mobile telecommunications went down” (Former Boston Police Department Commissioner Bill Evans)<sup>15</sup>.

On the finish line, where the two attacks occurred, first responders, as well as the Explosive Ordnance Disposal (EOD), SWAT, Air Wings and

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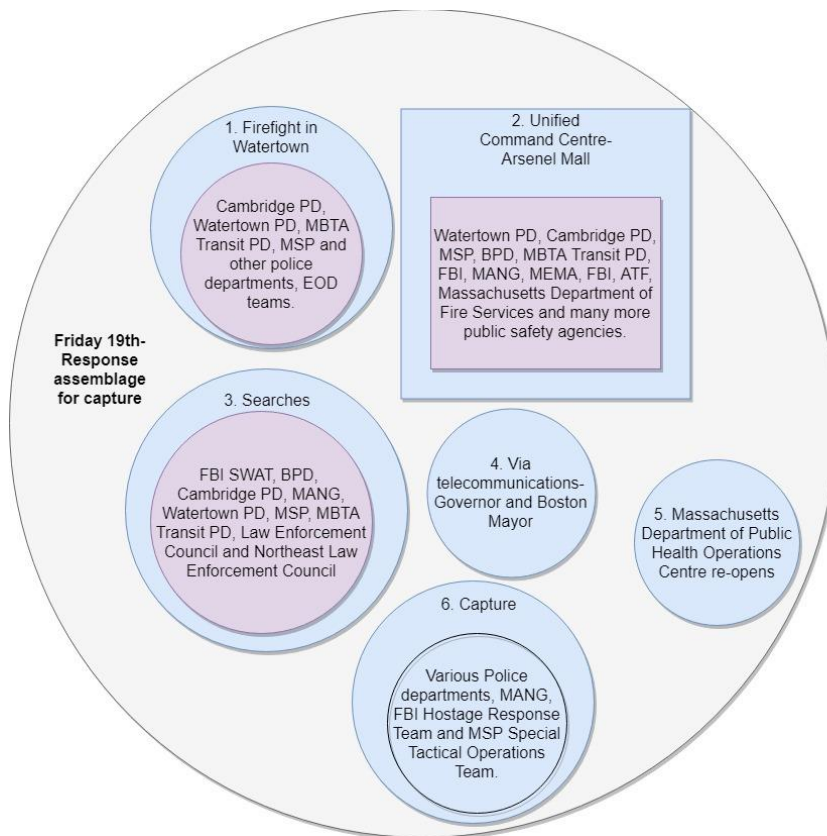
<sup>15</sup> A direct interview with Former Police Commissioner and Incident Command Officer Bill Evans proved impossible to attain. However, he spoke at the American Ambassador's Residence in October 2018 (see Appendix 9 for the invite and notes. Thus, when Bill Evans is referred to it is taken from his speech and is not verbatim.

surrounding hospitals all activated the relevant agency response. This was aided as “they set the bombs off 4 hours in, when the crowd had moved rather than earlier when the winners were coming in. Further, because it occurred at the finish line the medical tents were already set up. Thus, within 20 minutes everyone was removed from the scene and they all survived, anyone who died, died there” (Bill Evans).

However, as the mobile phone network was overloaded the responders used their radios for communication but neglected to use the marathon specific channels that would have facilitated quicker sharing of information across agencies (ARR, 2014). This illustrates a lack of recognizance of the importance of inter-agency coordination at the operational scale and a restriction on the sharing of power between agencies. Further, the relationships between law enforcement and hospitals became fractious due to the intimidating presence of law enforcement officials interviewing patients and taking victims cell phones for analysis, without properly explaining the process. This turned out to be invasive but deemed a necessary investigative method as all cell phone data was uploaded to a server to be analysed. However, delays occurred as it crashed and only one technician was available to fix it (ARR, 2014), but this information was not shared with the victims or hospital staff. Thus, this lack of information emanated from an imagined sense of power and authority that the police officers held by both the investigators, hospital staff and patients, which is evident in how the staff and victims described them as “intimidating” (ARR, 2014:42) resulting in tension occurring between hospital staff and investigators reducing the ability to effectively coordinate. This produced an imagined hierarchical assemblage, with law enforcement acting as the King and hospital staff and patients being the subjects who must obey due to a sense of self-discipline and fear of powerful authorities like police forces. (Gordon, 1972 and Sennellart et al, 2007))

Further, there was no Joint Information Centre for the coordination and dissemination of information, which resulted in individual agencies providing information to the public which was not vetted when the UCC stood down on Tuesday 16th. Thus, miscommunication between agencies and the public created tensions and confusion regarding situational awareness and true information which became critical during the third major stage of the event – the capture.

Figure 5.19: Stage 3 - Response assemblage for the capture.



Source: Information retained from the After-Action Report (2014).

This assemblage developed and was re-shaped during a 24-hour period from Thursday 18th April until early evening on Friday 19th. The oscillations and re-shaping were based on the events that were occurring and the required response level, but it also resulted in a lack miscommunication, crossfires, command, control, sharing of local knowledge and firing authorisation.

The initial emerging of the response assemblage occurred after the carjacking and chase by a Watertown Officer which involved a firefight between the suspects and several police departments. However, there was a lack of firearm discipline as described in the After-Action Report (2014: 10)

"Although initial responding officers practised appropriate weapons discipline while they were engaged in the firefight with the suspects, additional officers arriving on scene near the conclusion of the firefight fired weapons toward the vicinity of the suspects, without necessarily having identified and lined up their target or appropriately aimed their weapons.

Officers lining both sides of the street also fired upon the second suspect as he fled the scene in a vehicle."

This illustrates lack of management and information of the scene as there was no recognisable senior officer (Bill Evans was the Incident Command Officer but his efforts were affected by the sheer number of officers leaving the staging area and travelling to the scene without authority), combined with limited preparation for such an event, where the lines of responsibility are unclear due to numerous police departments emerging on the one scene. This was particularly confusing because it was a federal case rather than a city or state case, so the FBI had taken responsibility as the lead agency after the attack, but they recognised Bill Evans as in charge and allowed him to continue to the best of his abilities under the circumstances (ARR 2014 and HHSCR, 2014). So, the lack of governance, combined with human emotions of fear and anger (Bill Evans recognises this as an explanation also), resulted in dangerous crossfires and undisciplined firing towards the 'suspected' terrorists, as they were at this stage.

This firefight resulted in the re-deployment of a Unified Command Centre in the Arsenal Mall containing most of the agencies of the original UCC, but incorporating more local police departments. A request was sent to law enforcement officers with "2500 emerging on the UCC from over 116 federal, state and local scales" (ARR, 2014:10). It was this extravagant response that facilitated a collapse in command structures and inter-agency coordination as only requested officers were "assigned roles or provided with a briefing" (ARR, 2014:10) meaning that self-deployed officers were under no command, received no informational brief resulting in "logistical, command and safety issues" (ARR, 2014:10). Further, officers were resistant to taking direction from a senior officer of a different agency. This is illustrative of splintering power as the numerous police agencies all have to share power and knowledge when traditionally they are independent agencies which rarely cross jurisdictional boundaries particularly for local police forces such as Watertown PD. The role of the UCC should have been to create command structures and implement some sort of hierarchy. Instead the splintering of power between the agencies resulted in very weak inter-agency coordination. While the police departments were undertaking searches and the UCC was attempting to create some form of unified coordination, the Governor and Mayor of Boston were informed of

the sighting and searches via telephone while the Massachusetts Department of Public Health Operations Centre re-opened and prepared for possible casualties. While shelters and public orders were put in place in a disorganised manner as described by Participant IDF.

“So, the marathon bombing, I don't know how much you followed it, but the Friday after the bombing, so the bombing was on Monday, so the Friday after the bombing there was a manhunt where they found the people and had that chase through Cambridge. And they shut down the city and everybody was told to shelter in place and stay at home. Which I think was unprecedented, or at least unusual, that many people to be told, on a workday, to stay at home. When it was a beautiful day, warm and sunny, a nice day, it wasn't like a snowstorm or anything when people are used to staying at home. And so, it started out as, I have to get the exact order, but it started out maybe Boston and then it ended up being extended to all the cities that boarded them. It was very piecemeal, so each city decided separately if they were going to put issues of shelter in place or whatever.” (Participant IDF)

Further, the tension and lack of information sharing between police departments resulted in the misidentification of the taxi driver as a terrorist and a black SUV being shot at by a police officer as it had mistakenly been reported as stolen. Consequently, it turned out that the vehicle was occupied by plainclothes officers from MSP and BPD (ARR, 2014). Information on their whereabouts and vehicle were not shared with the other police departments resulting in police agencies firing on police agencies, which is indicative of weak inter-agency coordination and an assemblage with no determinable shape.

This lack of coordination and inter-agency collaboration was further identified in the After-Action Report (2014) as it described a disinterest in local knowledge. Clearly, local officers would have the best understanding of the geography of the area and the community culture. Yet, this knowledge was not utilised resulting in a slowness in response to various sightings and information which could have been made more efficient if Watertown PD had been included in a more knowledgeable and powerful position within the assemblage (ARR, 2014).

Finally, the capture re-centred the assemblage, but again there were issues with miscommunication and undisciplined firing, as one officer fired his gun due to movement in the boat resulting in other officers firing in the belief they were being fired on (ARR, 2014). When, I questioned Bill Evans on this he confirmed that the shot was not by a Boston Police Officer, but that it came from an officer with inadequate firearm training.

This case study illustrates the importance for assemblages to have fluid borders which allow agencies to shift and move and for assemblages to be re-shaped to suit the situation. However, this is not an easy task as seen, particularly by the third stage. Assemblages need to be structured and require strong inter-agency coordination and trust for them to function and respond efficiently. By weakening inter-agency coordination, it becomes impossible to recognise the structure of the assemblage as either hierarchical, flat or oscillating instead it almost becomes one of anarchy and mess. Thus, this furthers the argument that there is a third ontological option for understanding assemblages, one which acknowledges that, in reality, assemblages oscillate between being flat and hierarchical and how this movement occurs has been shown in both case studies.

However, the Boston Marathon Attack introduces a fourth type which is not an ontological understanding, as the assemblage is deconstructed due to the axiological foundations and social constructions of the responding police officers who responded in an almost primal manner while working within a formal structure. The officers involved were disorganised, un-commanded, uncoordinated and siloed in their willingness to engage with other agencies but they all had one goal to find the second suspect. They all shared the same values of 'serve and protect' which explains why 2500 turned up. Further, the bombings were a direct attack on their social worlds and deconstructed the social safety and comfort of Boston and Massachusetts, which could only be re-built when both suspects were captured. This resulted in a lack of information, dire coordination, crossfires and ineffective and slow response and consequently, the deconstruction of the US emergency management assemblage as the response turned into anarchy. Yet, each police officer personally knew their role and their responsibility, so the deconstructed assemblage can be determined as an imagined rather than a formal assemblage of



police officers working to re-build the social world of the jurisdictions they swore to protect.

## 5.8 Conclusion

In conclusion, there are some aspects of emergency management in the US that are excellent and some that need critique. One of the key positive elements of the United States Emergency Management System is that the policy is legislated and connected with funding. This ensures a similar system is used across the US and that all agencies and scales know the procedures that must be followed. It could be argued that by restricting funding for the local scale if they do not follow the federal guidelines, is overstretching their power, but it ensures that at all scales there are plans, that training is done, and that resources and centres are equipped. In a country prone to everything the only way of mitigating and responding to events is through formalised policy.

For instance, during a ride along that I took part in in April 2016, I observed several different types of calls from rescue to road traffic collisions (RTC) to illnesses in the home. I was unsurprised when Police and Fire turned up to the rescues and RTCs but was shocked when they arrived for home calls. Then in November 2017, I witnessed several home calls where again all services responded. When I informally questioned this (I was not allowed to record anything) the responses varied from safety, boredom and everyone is trained so it is just about getting on the scene as soon as possible. However, I witnessed how these informal networks work and why they are important at the operational level with regard to the sharing of information and knowledge quickly. During a major disaster these people will rely on each other and by working together constantly the likelihood of an efficient coordinated response, at least at operational scale, increases because as participant IDK suggests it results in “swarm intelligence, the way a beehive works, everybody just knows their role and that is really how it works.” Thus, there is a need for the informal aspects of emergency management to be catered for and discussed in policy but not in a manner that formalises them.

Connected to this formal/informal dichotomy and need for coordination is the issue of legacy siloed agencies which, as with the Irish policy, the

consequences of such is not discussed in the policy. However, with the participants of this research, they become clear through their frustrations.

“[...] but they [Fire] are kind of learning our ways since working with us but it used to be a big ego thing on their side and they would end up not having as much information, but they are starting to learn, actually EMS seems to always get their nose into things and I think it is the way that we present ourselves. We want to work with people, not against them and I think Fire is definitely starting to see that as a better road to be on, which is good, it is good for everybody, but for a long time they didn't see it that way” (Participant IDD).

“[...] it seems like the way city departments operate normally, that you have your body of work that you do, and you focus on and so when you are constantly underfunded and understaffed and all these pieces it is harder to be more collaborative. It is not an excuse, but it is definitely one of the big challenges around how to do this well and generally, some of the best practices that I have seen have been around people being able to convene people for collaboration in a way where it actually helps them get their work done” (Participant IDA).

Further, this impenetrable structure is similar to a military approach which the US emergency management system is still influenced by. This is clear in the inaccessibility of emergency management policy, in the influence and power that the Department of Homeland Security has at all scales for instance at the local scale in Boston it is the DHS that manages funding for the region (OEM, 2018). Even the language used in some of the documents is military inspired. A key example is the use of “Mission” - this is almost an over-zealous word with Hollywood connections when the word ‘task’ would be a less political or militaristic term to explain the same action (DHS, 2013:20). At the federal scale, there is a pre-occupation with protecting territory with Trump’s wall and the different responses to foreign and domestic terrorism and the findings of the GAO testimony after Hurricane Katrina.

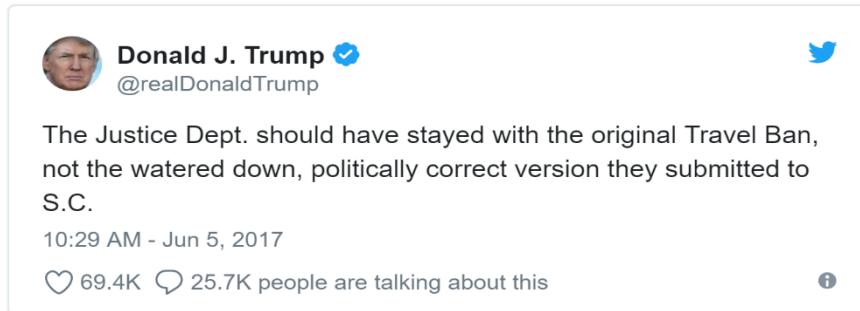
The GAO testimony found that although both government and private resources were utilised during Hurricane Katrina, they were overwhelmed

and that the lessons learned from both Hurricanes Katrina and Rita are the same as those learned after Hurricane Andrew which devastated Florida in 1992. This raises questions about the effectiveness of federal emergency management and its ability or will to evolve and build upon lessons learned. Instead, the federal scale appears as a bureaucratic politically fuelled arena with weak powers but with a clear sovereign authority one-person decision maker in the President. It also illustrates a lack of understanding of the probability surrounding repeat events which encourages a lack of fast-paced response. Yet, response to foreign terrorist threats is enacted with haste suggesting that the protection of territory from foreign powers still trumps protection of life and land from natural hazards, which are deemed local issues rather than federal.

Two-word choices have been used in the above paragraph which need further explanation. The choice to distinguish between the foreign terrorist and homegrown is as a result of recent developments in US history. President Trump has enacted several restrictions against immigrants and tourists, the most obvious being Executive Order 13769 “Protecting the Nation from Foreign Terrorist Entry into the United States” which was in effect from 27 January 2017 until 16 March 2017, apart from when it was blocked by the courts. The key aims were to reduce the number of refugees, temporarily suspend the U.S. Refugee Admissions Program and the indefinite entry of Syrians. Citizens of Iran, Iraq, Libya, Somalia, Sudan and Yemen were also blocked from entering even those holding green cards or valid visas.

After March 16, Executive Order 13780 “Protecting the Nation from Foreign Terrorist Entry into the United States” continues to restrict travel into the US from certain countries and for all refugees who do not have a visa or valid travel documents. Trump called the order a "watered down, politically correct version" of the prior executive order via Twitter, see Figure 5.20.

Figure 5.20: President Trump’s response to the Travel Ban



Source: Donald Trump's Twitter Page (2017).

Yet, during homegrown terrorist attacks such as the Las Vegas shooting in October 2017 and the Stoneman Douglas High School shooting in February 2018, the federal response is to console but enact very little change particularly with regard to firearm restrictions. Thus, the decision to distinguish between foreign and US terrorist is due to the defined difference in response by federal authorities and the clear military approach of defending territory first.

The second-word choice is 'local'. There is a vast difference in the Irish understanding of local and the US understanding. By stating that natural disasters are viewed as local incidents that are not of major federal concern, is not to limit them geographically, but to illustrate that a natural hazard is less likely to affect the whole of the United States at the same time in the way it can affect Ireland. However, floods, hurricanes etc. can affect multiple states simultaneously, but in terms of the federal government are still local incidents whereas, military or concerns over protection of territory are understood as federal.

However, at state and local scale the military connotations are weaker but the language at the federal is strong, powerful and impactful "unified command" (DHS, 2013:6), "Strategic Information and Operation Centre" (DHS, 2013:6) and "Fusion Centre" (MA-CEMP, 2017: 2-2). Culturally, the US is a

military loving country and, although the emergency management programs have evolved away from their early militarised days to more Civil Defense operations, the language is still akin to strength, protection and power. It still reads as conflict and defence language in comparison to Ireland's softer and contained language.

Further, due to the three distinct stages of response, the Boston Marathon bombing confirms that the assemblage morphs, re-shapes and even dismantles to suit the requirements of that particular time and space but also due to natural human responses an element that is not as clear in the Irish case study. Although, the IEMA and the USEMA have different structures, they both respond in the same way. They oscillate between vertical and flat spaces and sometimes they occupy a messy middle space because of external issues such as governance and internal issues such as inter-agency trust and communication. These two chapters defend the proposition that real-world/real-time assemblages cannot be studied through only one ontological framework as discussed by Brenner et al, (2011) and McFarlane (2011a/b). They are live, fluid and flexible structures made up of real people, processes and objects which cannot be confined to one particular shape, space or time. Further, how they re-shape is highly influenced by the power dynamics between and within agencies, and a study of assemblages needs to take this into account but to broaden beyond Foucault's idea of 'power is everywhere' to an understanding that yes, it is everywhere but that it is still highly regularised, controlled and ultimately there is a sovereign who can take control especially when human will begin to affect the response network. This was seen when former Boston Police Commissioner Bill Evans, stated that he had to shout and scream at the responding police officers at the boat scene, after a rogue shot was taken, to ensure that the terrorist and the officers remained safe. The next chapter explores in detail, using these case studies, some of the external factors that affect the oscillation of the assemblages from a policy shape to an activated shape.

## Chapter 6: Politics, Governance, (In)formalisation and Institutionalisation.

### 6.1 Introduction

The previous two chapters provided insight into the power dynamics which result in the IEMA and USEMA oscillating positions under different circumstances. However, to fully understand how these power dynamics actually cause the assemblage to oscillate, it is necessary to study the broader external factors that influence CMAERA and its agencies. There are three key factors that emerged from this research; political will and governance, institutionalisation, and agency (in)formalisation. However, this does not discount other influences such as economic factors, resources, the role of the media and socio-spatial factors such as funding which were mentioned briefly and deemed as insignificant. This was illustrated by a senior official of an emergency service in Dublin who argued that “this morning we were talking about equipment for flooding and the issue of finance is not the barrier so that would be my sense of it”.

Initially, it was considered that these three factors were separate unconnected factors that could be explained individually. However, as the research continued, it became evident that the relationship between the three factors is much more complex, messy and inter-scalar. Therefore, this chapter is not structured by factors, but through three questions so that the narrative can demonstrate the subtle but complex connections between how they influence one another and, in turn, how this contributes to creating the conditions needed for the assemblage to oscillate when necessary.

Firstly, this chapter begins by discussing political will and governance structures. It brings ‘dispositif’ and ‘oikonomia’ into conversation with how a CMAERA is governed, followed by the influence of ephemeral political spaces and how that can affect the shape of the assemblage. This then leads to a discussion on the informal and formal organisation of CMAERA indicating both the advantages and disadvantages of each structure and then, by referring to the case studies, it illustrates how these influence the shape of the assemblage. Finally, the ignorance surrounding institutionalisation within emergency management is

discussed and explored through a short case study on the institutionalisation of AGS.

## 6.2 Political Will and Governance

Firstly, can we understand or categorise the governance of CMaERA through Foucault and Agamben's assertions? To recall, 'dispositif' is the idea that there are multiple but dispersed sovereigns who govern society through decentralised and networked power dynamics whilst, 'oikonomia' argues that there is one covert sovereign authority who oversees agencies and their leaders in their duties. It suggests that the sovereign creates the standards and rules for society and encourages their agencies to enforce them. I do not think either assertion can adequately capture the complexities of a CMaERA, but I think they offer a position to begin thinking through how and why a policy is created and who makes decisions at all stages of emergency management. Similarly, to assemblage theory I argue, that the governance structures of a CMaERA change as it shifts position in response to an event or as it rolls back to its everyday functions.

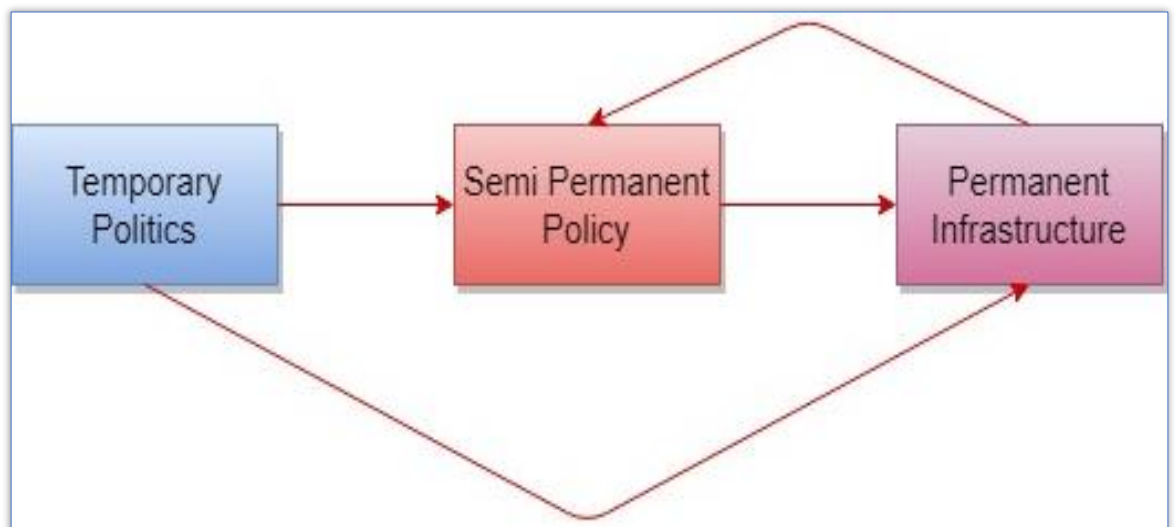
The CMaERA, while responding to everyday events or during steering meetings, leans towards a flatter assemblage shape and can be easily understood to be governed in more of a 'dispositif' manner. However, once agencies are in the field and senior officials and government departments are in the relevant coordination centre, the governance becomes more of an "oikonomia" type, as the once-covert sovereign now re-emerges to oversee the work of its underlying and usually more expert leaders. An example is the Taoiseach regularly attending the National Emergency Coordination Centre during major emergencies. While, day to day the Taoiseach remains unseen allowing the sovereigns of each agency to operate as they choose.

“While it is technocratic led, if it is on a stage the Taoiseach will be involved in the initial stage, the lead government minister will be involved if they need to be but generally they are happy to push it back towards the technocrat.”  
(Representative of an emergency management agency).

Secondly, what does this theoretical governance system actually look like in reality? Regardless, of whether you understand the governance system in a 'dispositif' or 'oikonomia' shape, governance stems from those in control whether

there are many or just one. Yet, those in power tend to be those in government which is an inherently ephemeral structure which changes over time with new power dynamics introducing new priorities, practices and perspectives, which change the techniques of governance. Thus, when discussing CMAERA and why they re-shape, we need to acknowledge that these are permanent agencies operating within a temporary and shifting political space and that they must create a policy that can persist across multiple and changing political domains. As detailed in Figure 6.1, the ruling government administers the individual agencies of the CMAERA and influences the budgets, resources, policy direction and priorities of each agency through their parent government department. While senior officials of the CMAERA agencies sit on the steering groups and contribute to the writing of policy, it is only when the assemblage is activated that their providential will in using the policy becomes apparent. If the policy does not work or meet the criteria of the event, their expertise will supersede that, (as demonstrated during the response to the Boston Marathon Bombing). However, as the CMAERA re-shapes and digresses away from the policy structure during major events, why does the policy not evolve accordingly?

Figure 6.1: The relationships between politics, policy and infrastructure



Source: Author

The overarching policy such as the Framework or the Stafford Act cannot be easily changed in response to every event especially as they can never



fully capture each potential scenario. Instead post-event, CMaERAs conduct cool-down meetings and the lead agency are “responsible for generating reports and everything else afterwards” (Participant ID26) on how the event was managed and what could have been done better. These reports are shared and internalised by the agencies involved and “because we have done some after-actions after the winter storms and consistently across the board, those departments that were at the emergency operations centre saw the benefit.” (Participant IDM). These findings are usually published as guidance protocols which are semi-permanent as they will only change when circumstance dictates, but they “are doing a better job of conducting after action reports, we can really look at what went well, there are areas for improvement” (Participant IDM), meaning that policy may change quicker than before.

Further, in the IEMA, as the key first responders are governed by either national or local government, which as noted is temporary, there is evidence of their normally permanent infrastructures being affected by changing political will. An example is outlined below as there is a proposal to change the structure of Dublin Fire Brigade and the National Ambulance Service.

#### 6.2.1 Dublin City Council versus Dublin Fire Brigade and the HSE

The Health Service Executive (HSE) is the parent agency of the National Ambulance Service (NAS) who has operational power for the entirety of the Republic of Ireland, with the exception of Dublin City. The ambulance service in Dublin City is under the remit of Dublin Fire Brigade and is funded, in part, by Dublin City Council and the HSE. However, in 2015, it emerged that the HSE and Dublin City Council were in talks to transfer the ambulance service back to the HSE and, by default, the NAS, as Dublin City Council argued that they were footing the bill with the HSE not providing their part of the funding. Thus, Dublin City Council and Dublin Fire Brigade (DFB) are in the middle of a conflict regarding funding for the Dublin Ambulance Service (The Irish Times, 2015). In this example, the DFB ambulance service, which was a permanent feature, is now seen as temporary and moveable because it suits political will and finances. It also demonstrates that emergencies in the neoliberal city are seen almost as commodities; if they are not producing for the governing authority, particularly, a local authority, who is operating a neoliberal and austere budget, then they see no reason not to remove that

service. This is occurring under one particular city manager with particular economic priorities. If a different manager were to take over, the situation may or may not be different and it is still an unravelling situation at the time of writing (November 2018).

If it goes ahead, the NAS, would take over Dublin City's Ambulance service and provide the service in the same reasonable manner they do nationwide, but there are advantages for DFB having their own ambulances serving a city the size of Dublin. The key benefit is they can respond to any major event within the golden hour even if no ambulance is available because fire-fighters are trained paramedics and the defibrillator is on the fire truck. The following conversation highlight this:

**Respondent 1:** The ambulances are so busy.

**Respondent 2:** Sometimes we use the fire truck as an ambulance because I am on a fire engine today. I'll go and six of us are with the patient and if needs be, we will wait and keep him supported until the ambulance arrives.

**Respondent 1:** And if it is a cardiac arrest the lads can give the drugs and they have the defibs, so they can shock them, and they can give them oxygen and they can give them drugs. If it was an overdose like there are a lot of overdoses in town, so the lads can go and give them the narcon and that will take them out of the hit if there are no ambulances available. Give them the oxygen." (Participants ID12).

In Boston, the Office of Emergency Management has also been influenced by political will as discussed by participant IDM

"there are always some political elements and then also how it is viewed. So, we had a previous Mayor who really viewed the use of the emergency operations centre as the city has lost control when in actuality it is more we are activating it and having everybody there because it provides us with the ability to control things to have that situational awareness, that one common operating picture. And Eleanor (Pseudonym) has been very successful in getting that message out and the departments have seen the benefit."

This quote explores the different attitudes and perspectives that different governments bring and how it affects even local government offices, such as the Office of Emergency Management (OEM). What is particularly notable about this latter example is Eleanor's ability to circumnavigate and spread the message about what the OEM is for. It is no easy feat to share this message across local government, influence a new Mayor, and also encourage first responder agencies to engage. Thus, the approach of the OEM in overcoming politics is a method of protection for the office. If the office was only known or used during major catastrophes, then its everyday remit and its use during organised events such as the Boston Marathon would be underrated and underutilised with emergency response being allocated to the SEOC.

For instance, during the Boston Marathon Bombing, Boston's OEM was not open as, at that point, its necessity was undervalued. A new director of the OEM was appointed in 2013 (the year of the bombing) while the current Mayor, Marty Walsh, only began serving in 2014. These political changes combined with the tragedy of the Boston Marathon resulted in significant alterations being made to the OEM as it was now assigned as the lead coordination centre for major emergencies in Boston and for prepared events that occur within Boston. This small change had radical effects on the States response system who can now coordinate directly with Boston. Further, the use of the OEM as an inter-agency centre means that there are less agency-specific control rooms that all operating at the same time, vying for the same resources and struggling to share information across all agencies in an efficient coordinated manner. Although Boston Police Department and the health services still have their own operation centres, they send personnel to the OEM, creating a hierarchy and knowledge of where direction and decisions will come from resulting in coordinated decisions. This significant change to the organisation of the Boston branch of the USEMA assemblage, is due to a change in political will, new perspectives and priorities after the attack. This results in better inter-agency coordination and communication, quicker on the ground operations, knowledge sharing and the development of informal relationships in a highly formalised system. Thirdly, why does it matter if the CMaERA is formal or informal in shape in relation to its need to re-shape?

### 6.3 (In)formalisation

Understanding formal and informal relationships helps to identify how assemblages can be re-structured and can oscillate position as the power dynamics within the assemblage and between the agencies are determined by the type of relationships at the scene of the event. Power will bounce and splinter between the agencies and the inter-jurisdictional scales if the assemblage is more informal in response as there is an inherent trust between the responders due to previous working histories. Whereas in situations where trust and informal networks have not been able to flourish, the assemblage tends to veer towards a hierarchical structure. How formal and informal networks develop depends on numerous factors including policy and training.

In the US emergency management policy is highly formalised, legislated and restrictive as well as being connected to funding for the local scale. While in Ireland, the policy is less formal, unlegislated and not connected to funding. Both extremes have their benefits and disadvantages. The benefits of a highly formalised system are knowledge and practice and clear routes for resources, assistance and funding. The disadvantages of the formalised system is that they weaken loose networks which are essential for effective response and inter-agency trust and it creates layers of tangled bureaucracy as discussed by Participant IDD, an official in Boston Emergency Medical Services (Paramedics)

“Yeah, it is almost too formalised because at the end of the day we end up with a unified command centre, an incident command centre...”

The benefits of a less formal system are the ability to adapt and be flexible in a crisis and with lead agency responsibilities. The disadvantages are that decision-making, funding streams and crisis escalations can be more difficult to attain or initialize.

In Ireland, the informal networks developed because of how key agencies evolved. AGS and the Fire Service grew and organised without significant interaction with each other, resulting in the formation of informal rather than formal networks (An Garda Síochána, 2016; Conway; 2014 and Geraghty and Whitehead, 2004). Whereas, the National Ambulance Service only began in 2005. Before this, ambulance services were run separately by regional health boards (adapted from

interview notes), further restricting the development of formal relationships. Thus, this history of informal networks is still pervasive today even within a landscape of formal networks as promoted through the Framework.

"Even in areas where there are good relationships say between the ambulance service and the voluntaries, in other areas there wouldn't be that relationship and it's not that there is anything, it's just never formed over time"  
(Representative of the National Ambulance Service).

Further, as the Framework remains unlegislated, it allows for the silo-mentality of agencies to remain as there are no ramifications for choosing not to develop formal relationships, individual response plans and thus, to develop better coordinated relationships within the IEMA. An example is the siloed nature of the four local authorities which govern Dublin County and City; Dublin City Council, South Dublin County Council, Dun Laoghaire-Rathdown County Council and Fingal County Council. During crises, for example a flood event, these authorities need to collaborate and coordinate their expertise, resources and information to allow for an effective response. Yet, there is a reluctance to call on each other as illustrated by a representative of one of the emergency services:

"You also have to realise that each local authority is almost like an independent nation and they don't like calling in other authorities to assist."  
(Representative of Emergency Services).

In the US, formalised policy is both a positive and a negative. It is beneficial as it creates a structure with clear processes for the escalation of events up the jurisdictional scales in comparison to the Irish system. However, it does restrict the power of agencies to request help as the decision-making process is removed from the local scale to the Governor or President who has limited knowledge of the on-the-ground situation.

Further, the ability for the President to make a decision to declare an emergency or not, is restrictive with no obvious route for an appeal. The Irish process, while more complex and repetitive, still ensures that representatives of the local scale are in the OEM informing the Taoiseach or Minister for Defence of the

situation, so they can make a team decision with input from operational staff that has not been shared upwards through advisors.

Further, these formalised structures focus on inter-agency, inter-jurisdictional and inter-scale coordination creating a highly structured and formal assemblage much more so than the Irish system. However, both neglect to discuss the importance of informal networks that help to establish trust across all scales and agencies. Trust building can be encouraged during training operations that occur within the formalised structures. However, it can only be fostered through the informal networks that develop during training, at the scenes of everyday emergencies, and through agency-specific community barbecue days or coffee mornings, which are a key characteristic of emergency responder agencies in Boston. The importance of these informal networks were discussed by participants IDM and IDK.

“We try to formalise, but it is the nature of the beast, there are always going to be informal relationships. You are going to pick up the phone and call the person you are comfortable with because it is just quicker, and time is of the essence.” (Participant IDM)

“For sure, longstanding relationships. For me, I have been with the Police Department for 33 years, there isn't an agency within the city of Boston that I don't know somebody personally that I could pick up the phone and call if I need some information or if I need to push something around. So, it is, even though we might not have direct connections, just from being around someone, it is kind of a small city. [...] The most important time to develop those relationships is before your catastrophe happens” (Participant IDK).

But even more telling is the response from Participant IDD an official in Boston Emergency Medical Services (Paramedics):

“Yeah, it is almost too formalised because at the end of the day we end up with a unified command centre, an incident command centre...”

Thus, by comparing the IEMA and USEMA, the formal/informal dichotomy of emergency management can be summed up by a tension between protocol and networks. Protocol representing the more formalised US system and

networks representing the more informal Irish system. As a result, there are tensions and contradictions between the formal and informal aspects of each CMAERA creating a tension point which, when reached causes the agencies to oscillate and re-shape in order to respond in real-time through whatever means available. They re-shape in order to push against the boundaries and achieve some level of adaptability and resilience or they rely on networks of trust where tasks and responsibilities are allocated and shared based on previous collaborative experiences, a characteristic which US emergency management struggles to achieve resulting in the formalised protocol-based structure, as illustrated by Participant IDM referring to the activation of Boston's OEM.

“And then probably getting the same people. So ideally if you could have the same people there is less of a learning curve and less training. And you may need a bench of two or three people which is what we ask for, but it can get frustrating when every activation you are getting someone new and probably is not the right person to be there. They either don't have the right job function, or they are not involved in the actual activation, they are more just there as a body. That can be counterproductive.”

Further, as argued by Brenner et al, (2011:223) accounting for the “institutional contexts” of assemblages provides insight into their structure and, unsurprisingly, this research found that institutionalisation also contributed to the formal/informal dichotomy of CMAERA.

#### 6.4 Institutionalisation

Institutional cultures are a characteristic of all emergency services and it affects how these agencies coordinate and thus, how the assemblage is shaped upon activation. Institutional culture refers to the methods of doing something which may or may not be reflected in policy, but it is passed down through the ranks over a long period of time until it becomes the only way of doing something, as explained by Conway (2014;148/149):

" In the police force, this is easy to imagine. A rookie is told he will learn the job from his superiors; he must do what they do. Their actions become internalised as reality by the rookie, who then projects them as reality, leading to their institutionalisation over time."

Even though emergency management theory proposed inter-agency coordination in the 1970s, it never acknowledged the significance of institutional cultures and the power they held in retaining agency independence when implementing policy (Bharosa et al, 2010; Mendonça et al, 2007). Thus, when they must coordinate during major events, there is space for conflict to arise as is evident in the responses to the winter storms in 2015/2016 and the Boston Marathon Bombing. As discussed by a representative of an Irish emergency management agency: “A big part of the experience for me of coordination is managing rows, rows between services, rows between agencies, very understandable, you do have a serious situation.” This phenomenon does not make inter-agency collaboration impossible, but unless it is recognised and structures are in place to minimise inter-agency conflict, then institutionalised cultures and behaviours can be detrimental to an effective response.

However, it is not as simple as creating a plan, such as the Framework or the MA-CEMP (2017) or NIMS and ICS. As Kapucu (2005) argues, trust and working histories are essential for the fostering of strong inter-agency coordinated relationships between all agencies at all scales and between the public and agencies (McGuire and Silvia, 2010; Bharosa, 2010). In order to develop this trust and minimise the damage of institutional differences, agencies need to work together more often because trust builds over time as was discussed by participant IDA.

“And developing relationships, that is the biggest piece. I often say that people talk about how we need to develop trust in communities and many times it is talked about as if there is no reason for mistrust, but we know that there is a reason that people have challenges in working with the government or trusting what the government is saying. Not because of anything that maybe I did or someone who is now talking into the room but by nature of being associated with the government there is a level of trust that we have to build because there has been a long history of inequities and institutional systemic decisions that cause harm to communities.” (Participant, IDA)

In order to develop this trust and minimise the damage of institutional differences, the state must intervene and drive inter-agency



collaboration by promoting "incentives and information" (Kapucu, 2005; 46). Further, trust builds over time as agencies work together more. Therefore, in Ireland where major crises are somewhat rare it is vital that inter-agency training and meetings are regular to foster this growth of trust. In addition, Mendonça et al, (2007) argue that weak inter-agency collaboration and information sharing are unlikely to be resolved if "institutional and technological" (p.63) issues are only dealt with at one scale i.e. the agency scale and not the community or state scale, instead these issues must be dealt with "simultaneously at the various levels" (p.63).

This is particularly true if you trace the reasons why some institutional cultures develop. Institutional cultures usually form through mechanisms that help to protect and grow the agency and ensures training or certain practices are the same across the board. However, over time, some practices of institutional memory can become toxic, restrictive and simply reproduce the status quo, with no reflection on the ethics or practicality of the actions. A recent example is within the HSE who outsourced cervical smear tests and tried to cover up the subsequent mistakes by "legally shredding files" (The Irish Examiner, 2018) and requesting the victims sign non-disclosure agreements, or within AGS who have been rocked by several whistle-blowers and the breathalyser and penalty points scandals (Irish Independent, 2018; The Journal; 2018; The Irish Times, 2017).

As a PRA and the longest running state agency of the CMAERA, it is interesting to explore how AGS has institutionalised over time, in order to protect themselves from the outside forces that act upon them. However, similar narratives could be written about any of the agencies in the IEMA or the USEMA and, in particular, could be compared with US police forces who often respond in racially motivated ways. Thus, please read this not, as my assessment of one agency being more important, but as an agency that has a long enough history to provide detailed accounts of the issues within emergency management assemblages, particularly, in terms of weak inter-agency coordination, institutional cultures, mistrust, conflict and agency independence, power dynamics and techniques of governance.

#### 6.4.1 An Garda Síochána

The development of AGS is one marked by colonial practices. Its birth was a direct result of Ireland's fight for independence as it replaced the colonial

police force the Royal Irish Constabulary (RIC), a highly centralised force, in 1922 and was supported by (the) An Garda Síochána (Temporary Provisions) Act of 1923. The 1923 Act is the first legislative piece which supports and outlines the duties and role of the force. It also changed the name to An Garda Síochána which was made permanent by the Garda Síochána Act 1924, and the Police Force Amalgamation Act of 1925 which included the Dublin Metropolitan Police, who had co-existed with the RIC, to create a national police force. Thus, the practices of AGS have not been created within a vacuum but are the direct result of a very turbulent past, including civil unrest, the Troubles, modernization, secularisation, civil liberty, neoliberal movements, and Europeanization (Conway, 2014).

Over the last 97 years, AGS has been a respected police force worldwide as a (mostly) unarmed force, they have also been regularly lauded and praised by the government and yet, they developed during very unstable times that, without a doubt, fundamentally affected how they are structured and work as an agency. They have undergone scrutiny regarding their practices of promotion, treatment of women, operation during the Troubles, dealings with the Catholic Church, ignorance of the conditions and practices of the Magdalene Laundries and other institutions, and the governance and culture of the force to name but a few (Conway, 2014). The last three decades have seen substantial concern over the inadequacies of the force through a number of tribunals with the eventual implementation of the Garda Act (2005), which attempted to address these issues, but has been criticised, especially in recent times, as to its ineffectiveness. For example, the Act is supposed to protect Garda whistle-blowers from Gardaí retaliation, but as we have witnessed in the last number of years this is not the case. Of course, US agencies are also rife with similar issues of institutional cultures, insularity and politics, so this is not a uniquely Irish phenomenon.

Evidence after evidence has shown the deep cultural issues within the force which range from bullying, witness tampering, ignorance of procedure and inside promotion. However, when calls for accountability regarding the culture of the agency came to the fore, the rhetoric produced was that “there was no institutional problem in AGS. There may be a few bad apples in the force but there is no other, embedded problem to be addressed.” (Conway, 2016:120). What also needs to be noted is, that although the successive governments have always supported and

promoted the force, they have often refrained from providing the relevant resources, working conditions and pay that they need to do their job (Conway, 2014). There has always been a disconnect between the rhetoric of the government and its actions towards AGS that in some way offers an insight into why such a negative culture has developed. It has emanated out of years of rhetorical support, low pay and poor working conditions (Conway, 2014). Conway (2014) offers the following example of this rhetoric. In 1987, the Minister for Justice, Michael Noonan, stated that “the Government of the day should not criticise the Garda Síochána. We all know there are mistakes in the operation, but it is obscene that the Government and the Ministers should be the first to lead the charge in the criticism of the Garda Síochána.” (Conway, 2014: 139).

Further, in October 2016, the Minister for Public Expenditure and Reform, Pascal Donohue stated “We don’t need Gardaí to go on strike for us to realise how special they are” (The Journal, 2016). Thus, the government rhetoric has never changed, but the conditions that the Gardaí work within are slow to transform and low morale has been a constant since 1925. This has created a toxic internal institutional culture which has led to an ‘us versus them’ dichotomy in which AGS are somewhat isolated from government departments and are institutionalised as a single entity that struggles to collaborate with other agencies. However, this issue is largely created by AGS in collaboration with external forces.

“Such evidence as exists raises a prima facie case for the contention that abuse of police powers may be a product of the history, institutionalised structures, limited tools, pressures on, and expectations of, the police and may be much more accepted and widespread than we have been led to believe. (McAleese 1987:54 and cited in Conway, 2014:148)”

The most recent change to the structure and organisation of AGS has been the Garda Act of 2005. "It was heralded by the Minister as ‘the most profound piece of legislation relating to an Garda Síochána in the history of the State’ (Dáil Eireann: 29/11/06 cited in Conway, 2014:195) as it proposed institutional reform with an emphasis on accountability that in recent times, appears more like a paper pushing job than actual reality. Further, it supported the continuing

and strengthening of centralised power and increased control by the government (Conway, 2014).

“The Minister is also given the power to issue a directive to the Commissioner concerning any matter relating to policing and the Garda Commission shall comply. This has the potential to undermine the Commissioner's operational control of the service.” (Conway, 2014; 197).

This also involved declining to create a Police Authority, which AGS has been calling for since the 1940s, to act as an independent authority and shift power away from the government, thus decentralising and depoliticising the force. “It has repeatedly been rejected by the Minister for Justice on the grounds that, ‘Dáil Éireann is Ireland's police authority and accountability through the Minister and the Commissioner is the most appropriate mechanism for democratic oversight of a modern police and security service’” (Dáil Eireann: 29/11/06 cited in Conway, 2014; 201).

Finally, the Act marked a new age for AGS, one marked by neoliberal policy and managerial practices. It advocated for “performance indicators” and was the beginning of a “discourse of managerialism” which has since infiltrated all aspects of the force and saw no shift back towards values of early day policing in both the RIC and AGS (Conway, 2014). However, as the recent breathalyser scandal indicates, these ‘performance indicators’ do not fix the culture. Instead, they just add another layer of bureaucracy where Gardaí must reach a certain target to be seen as successful, resulting in false numbers.

Another key factor that has affected AGS (as well as all other public services) in recent years, has been the public hiring freeze and the austerity measures they have been placed under. In 2009, recruitment was frozen in all public services. This placed AGS under immense pressure as they continually saw decreases in their force and gaps at the most senior level due to retirements (Conway, 2014). Gaps at the senior level are detrimental to the organisation of the force especially during times of crises as it is senior level staff who are responsible for the coordination of a response and who are critical within decision-making processes (O’Riordan, 1992).

Although it was announced in 2013 that the recruitment ban in AGS would come to an end, it was not until 2015 that the Minister for Justice, Frances Fitzgerald, announced the recruitment of 250 new Garda recruits (The Journal, 2015) and this recruitment drive has continued to date as with other public agencies.

The history of AGS provides reasons such as toxic cultures, low resources and pay and survival mechanisms which offer an explanation as to why inter-agency coordination often proves difficult and is fraught with conflict. Therefore, "[i]nstitutional rules function as myths which organisations incorporate, gaining legitimacy, resources, stability, and enhances [their] survival prospects" (Mayer and Rowan, 1977:340 cited in Conway, 2014) and these myths are passed as reality (Zucker, 1977 cited in Conway, 2014). Thus, we see the institutionalisation of AGS as these behaviours are "not simply tolerated but dependent upon incorporation and support" (Conway, 2014;148). Further, these behaviours and these myths are maintained because they benefit the actor, but this institutionalisation creates issues regarding change within the institute, be it policy or technological (Conway, 2014).

Unfortunately, there is numerous evidence of AGSs institutionalisation as listed below. All of these conditions have contributed to the toxic culture that has developed within the agency. These do not excuse their toxic practices, but they do shed light on where these toxic institutional cultures develop from and why a sense of protection and independence was needed.<sup>16</sup> Conway (2014) provides evidence for their institutionalisation:

- Tight ties between Gardaí and senior ranking officers during tribunals into the conduct of the agency – at the time of writing the verdict of the Disclosure's Tribunal was just announced clearing Sergeant Maurice McCabe, who exposed some of the negative institutional practices. The Tribunal also condemned the actions of the then Garda Commissioner, Martin Callanan, and other senior ranking officers who closed ranks to

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<sup>16</sup> Caveat: I choose to use AGS to illustrate why contextualising the history and geography of institutions and particularly, siloed institutions provides insight into why assemblages may re-shape. However, I recognise that AGS is not the only public agency to undergo institutionalisation, but the consequences are similar across agencies.

protect these practices, their own careers and pursued a smear campaign against McCabe and his family (The Irish Times, 2018).

- No interaction or questioning of the churches practice – again at the time of writing the Magdalene Laundries victims were being honoured by President Michael D Higgins and received a state apology with an acknowledgement that the state knew what was going on. This is further compounded by stories of AGS historically dropping pregnant women at the doors of these Mother and Baby homes (Conway, 2014).
- Evidence of tension between AGS and the Department of Justice as both the Morris Tribunal and Dáil have highlighted (Conway, 2014)
- Dismissal of the procedures set out by the Garda Act (2005) to set up a Garda Síochána Ombudsman Commission. Complaints are still being dealt with internally (Conway, 2014).

Due to AGSs institutionalisation developing as a mode of protection and subsequently causing a series of toxic cultures to develop AGS finds it difficult to coordinate with other agencies and their role within the assemblage is often fractious and conflict-ridden as detailed below:

“There is a cultural piece here, they think that they should in charge of the road traffic accident<sup>17</sup> and that is the language they use. The job of the Guards, the road traffic accident is to coordinate, it is to bring people together who need to say what is the situation here, how are we going to protect everyone, how are we going to do whatever? We have to be in charge” (Participant ID26).

Due to the detailed narrative offered it is easy to understand why institutionalisation can have a negative impact on the shape of the assemblage, especially if there is competition between agencies for control, responsibility and leadership. When this occurs, the lead agency may be dictated in the policy, but when activated, other agencies may begin to overstep their boundaries and ask questions concerning their role in the response rather than viewing the response as a coordinated effort with one key leader and decision maker. These agencies find it difficult to withdraw control

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<sup>17</sup> The fire service is in charge of road traffic collisions under the governance of the relevant local authority.

and be guided by another agency, as was evident in stage 3 of the response in Boston when Police Officers would only respond to the senior officials of their force and resisted the authority of senior officers from other forces.

## 6.5 Conclusion

So, what does all this mean for the CMaERA assemblage? By examining the broader contexts that shape the CMaERA and its agencies and merging them where possible, with the findings of the case studies, I argue, that emergency management as a whole is too dry-cut and simplified. It ignores contextual factors that actually shape how these assemblages respond and more often than not, it diverges from policy due to external and burdening factors such as those discussed.

Further, at times, policy and emergency management systems tend to be contradictory, demonstrating that there is a somewhat ad-hoc approach to managing these assemblages even in more formal spaces such as the US. For example, it is evident prior to 2001 that there had been a shift in emergency management from a model based on a hierarchy with functions of command and control towards a system that was more collaborative and coordinated within the USEMA (McGuire and Silvia, 2010; McEntire, 2007; Comfort et al, 2004; Waugh and Streib, 2006; Bharosa et al, 2010). However, Waugh and Streib (2006) propose that the establishment of the Department of Homeland Security re-introduced the command and control system without changing the structures of the collaborative system causing conflict as procedures are often contradictory. In Ireland, there is also a command and control emphasis within the Framework as lead agencies are pre-assigned (MEM, 2006). Thus, it is unclear how collaborative emergency management systems such as the IEMA or USEMA can be, when they must still operate within this powerful versus powerless formal hierarchical system as "no one can ever have complete control; it is not possible to fully command attention or to compel compliance" (Waugh and Streib, 2006: 138) from a diverse group of agencies, as illustrated by the Boston Marathon response. Regardless, a collaborative and coordinated system recognises that disasters do not obey geographical or jurisdictional boundaries and that the scale of an event often requires the assistance and resources of multiple agencies (McGuire and Silvia, 2010). Thus, there is a need to recognise that these systems do not remain in their hierarchical shapes but shift

and re-shape from hierarchical to flat, to somewhere in the middle, to complete destruction of the formal assemblage based on various “socio-spatial, political-economic and institutional contexts” and power relations (Brenner et al, 2011:233), and due to the simplicity of policy and over-arching emergency management theories.

By recognising that the key issue is institutional misalignment between policy and agencies, we need to begin exploring ways to create stronger connections and more consistent policies and practices. The next chapter is going to question whether the smartification of the CMAERA and the adoption of algorithmic governance is an appropriate route towards solutions for this issue.



## Chapter 7: The Data-Driven CMAERA?

### 7.1 Introduction

The ‘smart city’ agenda is a neoliberal management technique promoting data-driven and technologically innovative forms of governance. In Ireland, Dublin in particular and recently Cork, the smart city idea has been a policy of placemaking with a focus on solving city issues through technological innovation (Smart Dublin, 2018; Cork Smart Gateway, 2018). Boston has not adopted the term as they are already successfully engaging with ‘smart’ urban processes without the need to be known as a ‘smart city’, which they view as a corporate marketing tool overly associated with IBM. This is evident through the success of departments such as ‘New Urban Mechanics’ and programs such as ‘Analyze Boston’ and ‘BOS 311’, promoting the use of data and real-time local information for managing the city. As a result, the Boston part of the USEMA assemblage has already started the process of adapting to the technological evolution of the city by beginning to actively engage with data. Thus, in comparison to the Irish participants there was much more knowledge and acceptance around data analytics despite the fact that I never spoke with a data analyst in the US. Therefore, all the US quotes used in this chapter are from the staff of relevant agencies who may not have data analysis skills but are engaging and learning from the data in a manner that Irish participants are unwilling to do or worried about doing. As a result, this chapter will focus on the possible effects of ‘smartification’ on the IEMA as the primary case study while referring to the USEMA as a reference piece for contextualisation only.

Thus, the aim of this chapter is to explore whether the smartification of the IEMA is an appropriate method to overcome issues of institutionalisation, (in)formalisation and political will and governance, or is technology and data just a band-aid for these problems as they are inherently political and cultural issues? I pose this question to round off the thesis because of the current trend of using technology to solve urban issues and the use of data to manage cities. Further, due to the prolific study of urban data analytics and smart city ideologies across geographical literature at present (Wiig, 2015; White, 2016; Wiig & Wyly, 2016; Barns, 2016; Jordan Jefferson, 2018a/b; Long & Liu, 2016), it would be remiss to ignore the potential effect of technology on CMAERAs,

particularly because there are numerous agencies involved in emergency services which have control rooms both in Ireland, US and elsewhere.

For instance, in Camden, New Jersey as part of their urban regeneration programme, they created a “citywide, multi-instrument surveillance network” to work in combination with their “community policing agenda” (Wiig, 2018:403). The reasoning behind automating policing was to create the idea that Camden’s regeneration would result in a safer city and thus, become more attractive. Outside of the real-time control room, police services worldwide are utilising technologies around “network analysis, GIS, crime mapping, biometrics, fingerprints, DNA research, facial recognition, speech recognition, social media policing, shotspotter detection system and CCTV” (Faith and Bakir, 2015:1857). Drawing on the use of “GIS” and “crime mapping”, Jorden Jefferson (2018b:1) explores the implications of “integrating temporal data into GIS-based maps to predict when and where future crimes will occur” this is currently being used within Chicago Police Department.

Fire Services are beginning to integrate simulation games and virtual reality (VR) technologies into their training (Bell et al, 2015). This allows firefighters to experience and train safely within different simulated situations thus, ensuring firefighter safety and increased training opportunities before they enter a real emergency situation. The beauty of this VR technology is that it can be modified for different circumstances e.g. a small chip pan fire to a multi-story apartment block explosion. In terms of ambulance services, there is an interesting app on the horizon which would allow users to order an ambulance and destination hospital. It would also have an emergency button which would automatically assign the nearest available ambulance (Marimutha et al, 2018). Obviously, there are critical issues around this, with appropriate uses of ambulances and ensuring that the service is not reduced to a taxi-like system, but the emergency button is compelling and could be an answer for people hard of hearing, in danger, or unable to speak etc. It is during an emergency that this type of app could be useful, particularly if it was linked with your location as ambulance services, particularly in Ireland, have issues locating certain rural houses as discussed by two paramedics.

**Respondent 1:** Technology could be improved like we have been told we are going to get that, and I think if you ring Domino Pizza now, it will know who you are, where you are and your order

**Respondent 2:** They can read the caller ID coming

**Respondent 1:** We haven't got that

**Interviewer:** That is obviously a big issue

**Respondent 1:** And we have to get the address of you whereas if you ring from the address it should pop up, there is your address [...] I think with the EIRCODES, everyone has an EIRCODE

**Interviewer:** Can you use those EIRCODES?

**Respondent 2:** We can on the back of a truck on our phones, but we don't get the EIRCODEs as such, but we could use Google

**Respondent 1:** But you have to use it yourselves

**Respondent 2:** Yeah it's all our own stuff, our own Wi-Fi, we all pay for it.”

The above highlighted technologies are combined with numerous other innovations which emergency services engage with daily including, but not limited, to GPS, telecommunications and control room computer-aided dispatch (CAD) systems. This indicates that first responders are already integrating into the smart city space in interesting ways. However, the integration of technologies is unequal as some agencies, cities, states and countries are implementing technology at an advanced rate in comparison to other places. Thus, this chapter explores how and if the IEMA is becoming smart beginning with a discussion on the benefits of smartification and an exploration of two possible approaches that could be undertaken by the IEMA to become ‘smart’. Finally, it will question whether a smart IEMA is actually the correct solution or just an idealistic proposal.

## 7.2 Benefits of Smartification

At present, CMAERA agencies are engaging with technology such as moving hand-written notes to a tablet in the NAS or the use of drones and mapping in the Civil Defence (The Journal, 2018) and in the fire service

“At present if we go out for a patient it is all handwritten down, the care report, that will be all electronic coming at the end of this year so we will all have our tablets. The information will go so it will self-populate onto the tablet as well and then the practitioner can just fill in the boxes” (Participant ID17).

“**Respondent 2:**The drone - your allowed use that now in the rain.

**Respondent 1:** What the f\*\*k is that going to do, fly up over it and have a look? They have a drone and they could use it and say listen its flooded bad down there, it's up past the cars before you go in but with the equipment. [...] On the computer that we have in the control room, you can go down the scales and you can see hydrants and stuff like that. I don't know if you can see manholes (later found out that you can) and then it depends where the mapping is in the area on the computer. That could maybe be more up-to-date, and you could see. You could be in a fire and looking for a hydrant and you go down the scales, normally when you get a map you just see one scale, we can click it and it will go down scales so we can actually see individual houses and their numbers. It gets it down to a scale that you see the hydrants on it. Look outside number 36, there is a hydrant”.

However, in Ireland, this technology is funded and implemented in a siloed independent manner and in the US via state and federal funding policies. But what are the benefits of modernising systems, staff training and response protocol and policy in this way? Firstly, it promotes the use of online platforms to inform CMAERA decision making based on readily available data, rather than having to wait for all agencies to be represented in the Local Coordination Centre or to be connected via phone. An example of such is the Ezone tool which is a module within the Health Atlas of Ireland aimed at facilitating coordinated responses to events. The Ezone tool is an online system which integrates several datasets from a range of public institutions (see table 7.1) which can be used to help responders make quick and informed decisions regarding evacuation zones, available resources and the effects of weather patterns. The beauty of this system is that it is designed to ensure “minimal training and is specifically designed for infrequent use but usually under pressure”. This is particularly important as the reduction in training costs provides for an easier adaption of the technology into everyday use” (McIntyre, 2013).

Table 7.1: Type of databases integrated in the E Zone tool

Institution	Type of dataset/plugin
<b>Ordnance Survey Ireland</b>	The use of ‘Map Genie’ - which allows access to “the highest quality” data and shapefiles for mapping in Ireland. The OSI also provided access to data and shapefiles for county and electoral boundaries.
<b>An Post</b>	Provided access to the ‘GeoDirectory’ which has accurate and high-quality data for both “residential and non-residential” Irish addresses.
<b>Central Statistics Office</b>	Provided “population data by small area” from the 2011 census. When this is combined with the data from An Post, E Zone is able to provide an estimate of population within different zones.
<b>Irish Rail</b>	Provided data on railways, bridges and access.
<b>HSE Service Directory</b>	Provided location and contact details for different health centres such as GPs, hospitals and nursing homes as well as “emergency response locations and Seveso sites”.
<b>Electric Supply Board</b>	Provided information regarding access points and contact information.

Source: McIntyre (2013)

During an emergency, the Ezone tool can offer information on the “Incident location, risk zone, population at risk and response coordination zones” (McIntyre, 2013). The Ezone tool is further discussed and explained by ID35:

“The Ezone tool was originally designed around Seveso sites, these are sites that pose a risk. For example, an oil refinery or a place that stores chemicals might be a bit dangerous if they leaked, particularly with say Dublin Port, for instance, they might be storing things that would go in and out on tankers. It originally started as a tool for... let's say there is an incident there, you could for example draw, using census data and using GIS tools, you could draw an area around the incident and it would give you, using the census data, this is roughly the demographics of the area that could be affected by it. So, they might decide there are 100 people in this zone, let's evacuate them. Or there are 5,000 people there, the panic and chaos of evacuating 5,000 people outweighs the risks involved with whatever happened at that incident site.

It could also tell you, for example, there are so many hospitals, nursing homes, schools and so on that might be within the incident zone. You could also take into account weather information. So, you could say there is a wind blowing from the west and we are going to say we can draw a plume from the incident marker, so you could say directionally speaking, if it was an airborne gas or something poisonous, like a gas leak, for instance, you could say the wind is blowing this way, these people are more than likely going to be affected. There was also the ability to designate an incident zone and then have the GIS system work out, using the road network for Ireland, if we wanted to do a 5km exclusion zone where would we need to put the barriers? Where would we need to put the checkpoints?

In later revisions, there was the idea that multiple agencies could collaborate on the same map, for example, the HSE could define these are certain areas for ambulances and so forth. The Gardaí could say these are the checkpoints. The idea of a shared inter-agency map that if there was an incident, we could plan it out and share our response to it. But we could also do this when there is no incident and say this is the scenario. So, this was the idea behind the tool.”

Secondly, the collecting and analysing of data can be potentially useful for resource administration, response protocol, triaging, identification of trends and patterns and longer-term response planning, as discussed by IDL:

“I think the first thing I would identify is around the information side of it, so data is very important for us, having numbers and being able to have some more analysis of those numbers is very important. Particularly if we are talking about something like an epidemic or something that is longer term, a longer-term response. But even for smaller events, where there might be numbers of patients and different levels of acuity of patients and different things that we really need to be able to get data on quickly and share data on quickly”. (Participant IDL)

“We do all the crime mapping, we do all the executive summary reports, we do all the patterns and trends. Our analysts have portfolios, we have one person watching for gangs and gang violence, burglaries, larcenies, car thefts,

robberies and they report out and we put all the geo-mapping and everything like that, so we do that in my unit”. (Participant IDK)

Thirdly, the introduction of data analytics and technological projects can begin to break down institutional siloes and encourage inter-agency coordination, as discussed by participant IDB:

“So, we are bringing all these people together in the short term around this one specific project to provide data and provide feedback on the work that we are doing but also to start these conversations among the agencies because often a lot of them individually have their own risk management programme and they know how to protect their own assets and they do, most are pretty advanced”.

Of course, there are numerous other beneficial factors around streamlining talent, resources, quicker decision making, better uses of funding, and easier inter-agency coordination and knowledge sharing but the three listed incorporate what the participants see as the key advantages of becoming data-driven.

### 7.3 Methods of Smartification for the IEMA

Along these lines, in what ways could the IEMA – as a collective and not simply individual agencies – begin to become data-driven and technologically efficient? This section will discuss two possible approaches which have emerged through the literature review and the empirical studies. Firstly, should the IEMA re-organize in similar ways to other assemblages in order to access knowledge and technology? Secondly, is technology an appropriate solution for creating better inter-agency coordination between IEMA agencies or should the focus be on the broader mutually exclusive external factors?

#### 7.3.1 Approach One-Institutional Re-structuring

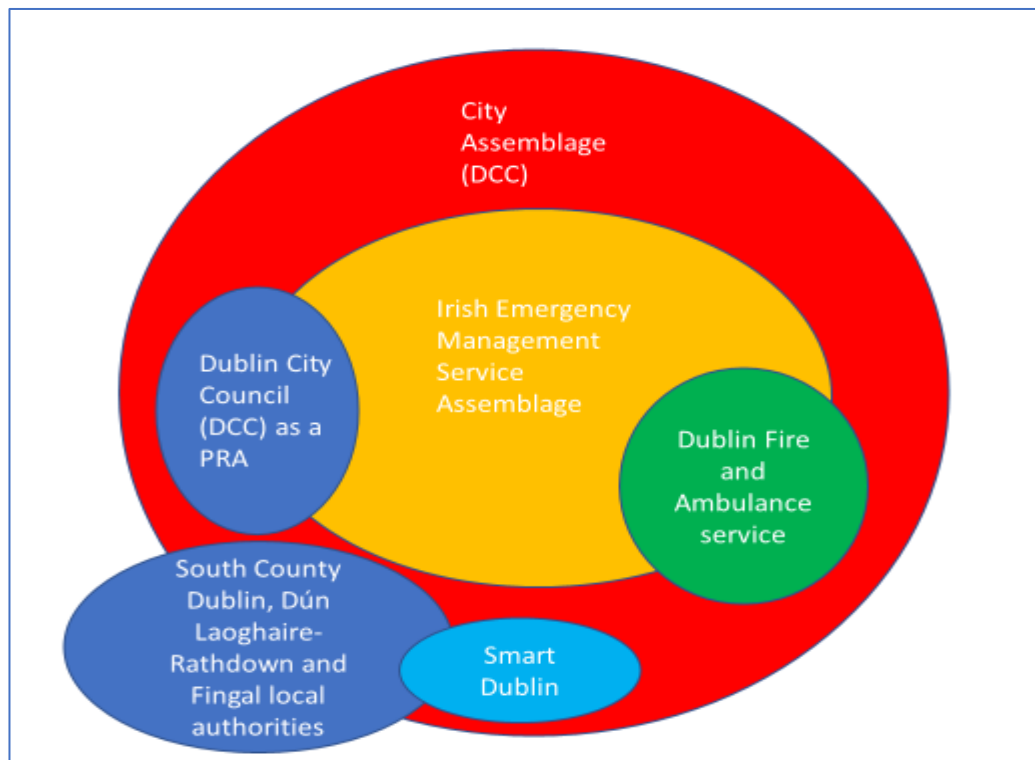
Although the IEMA functions independently and has its own history, geography and functions that contribute to how it operates, it did not evolve as a silo unlike the agencies located within it. Instead, the coordinating of these agencies into the formation of the IEMA developed, from higher scales of governance from the city, region and state. Thus, it is argued, that the IEMA, like other urban assemblages, are contained within the city assemblage (see Figure 7.1)

which is a powerful, albeit covert sovereign “constituted by ‘travels and transfers, political struggles, relational connections, and territorial fixities/mobilities’ but within a context of multi-dimensional and superimposed cyclical, alternating and linear rhythms and diverse temporalities” (McCann and Ward, 2011 in Moore-Cherry and Bonnin, 2018: 16/17). The city assemblage provides the space for the assemblages contained within it to overlap, interact, contradict and dismantle each other (McFarlane, 2011b and Dewsbury, 2011) but drifts away from the Brenner et al, (2011) argument that assemblages are single entities. Thus, this approach questions whether the IEMA should institutionally re-structure and create a bridging assemblage within the city in order to access knowledge and technology. This could be possible for two reasons.

Firstly, there are already existing connections and overlapping of agencies as seen on Figure 7.1. For instance, Dublin is divided into four siloed Local Authorities who all have their own governance techniques. However, Dublin City Council is the main governing body for the city part of the county and will be the focus of this section due to it being the primary location of the IEMA agency headquarters, interview locations, national government and where early adaptations of urban technology are occurring. This is not to discount the rest of Dublin or Ireland, but to provide a place boundary where the effects of the IEMA and smartification can be evaluated. Dublin City Council has responsibility for community services, emergency services such as Dublin Fire Brigade (DFB), environmental services, housing, roads and transport. Essentially, they govern and ensure the smooth running of all city services and are legislated and governed by the state. Further, as dictated by the framework and thus, the state, Dublin City Council is an assigned Principal Response Agency during times of major emergencies alongside An Garda Síochána and the Health Service Executive. The relationships between the Local Authorities, the different departments and the IEMA could be strengthened so that the IEMA can access the knowledge and resources housed within the wider assemblage.



Figure 7.1: Organization of Dublin’s Urban Assemblages



Source: Author

Secondly, there are examples of how other assemblages are structured which the IEMA could learn from. One key example is Smart Dublin which could also contribute to the strengthening of relationships and lessen the gap between the IEMA and where the technology is located within the city assemblage.

Smart Dublin began as a way to coordinate smart city policy, events and to attract investment and funding for Dublin’s Local Authorities. Coletta et al, (2017:25) describe the project’s:

“remit is to articulate a smart city narrative and strategy, initiate new projects and partnerships and attract funding and inward investment, and promote the work of the Dublin LAs (Local Authorities) within and beyond Ireland with respect to smart cities”.

Under Dr John Tierney, the smart city agenda had remarkable similarities with Celtic Tiger goals as it was very much a fiscal and economic driven agenda. He saw it as both an investment in the economy of Dublin and a path

towards recovery and the protection of public services (Tierney, 2013). However, Phase 1 was somewhat ad-hoc with Dublin City Council (DCC) being responsive to requests from outside companies, such as Intel and IBM, to allow Dublin to take part in a form of testbed urbanism. These corporations used Dublin as a petri dish to test their smart solutions to issues identified by them, representing the power stripping of local government as they attempted to solve city issues through a period of austerity.

The second phase of the smart city agenda began when Owen Keegan replaced Dr Tierney in 2014. DCC was still concerned with economic development, but began prioritising broader societal challenges such as, “transport congestion, responding to extreme weather events, tidal flooding, improved air quality and noise, citizen engagement and energy efficiency” (Keegan, 2015). Phase 2 saw DCC begin to work with the other three Local Authorities of the Dublin Region to form an assemblage of different actors known as Smart Dublin.

Smart Dublin is made up of a steering committee with representatives from different Local Authorities and Maynooth University. This committee consists of the Smart Dublin Project Manager from Dublin City Council, a Coordinator and Administrative Officer from South Dublin County Council, a Coordinator and Digital Strategy Officer from Dún Laoghaire Rathdown County Council, a Coordinator and Digital Strategy Manager from Fingal County Council and representatives from Maynooth University such as the Principal Investigator of the Programmable City Project, Prof. Rob Kitchin. The steering committee governs the Smart Dublin, Smart City and Smart Dockland teams. The Smart Dublin team consists of a Regional Data Coordinator, Programme Manager, Project Coordinator and Digital Communications Coordinator. The Smart City team consists of a Coordinator and Smart City Programme Manager, Smart City Planner, Smart City Marketing and Creative Lead and a Smart City Engagement Lead. The Smart City team focus on the idea of smart cities both within and outside Dublin and also promotes Dublin internationally, while the Smart Dublin team focus specifically on Dublin City. Finally, the Smart Docklands team consists of a Programme Manager, Innovation and Engagement Lead and a Project Management and Governance Lead (Smart Dublin, 2019).

As a result, of the formation of the Smart Dublin assemblage it became quite proactive in setting its own agenda by choosing the companies and research partners to work with to solve issues identified by city officials and citizens (Keegan, 2015). Thus, Smart Dublin facilitates the bringing together of agencies, corporations and academics and is an example of inter-agency coordination, but their role is mainly focused on economic development and start-ups. The parent Local Authorities of Smart Dublin are also active PRAs. Yet, there is a clear disconnect between where the technology is and the institutions such as the IEMA who need it. Table 7.1 provides some of the technology currently used by the three main first responder agencies in Dublin. It provides insights into the different uses and disconnection between the agencies but also between the IEMA and the city particularly in terms of data analytics and knowledge.

Table 7.2: Different digital technologies and data analytics in use within the IEMA and Dublin City

AGS	NAS	DFB	Useful city technologies	Notes
Emergency Call Centre/Control Room (some divisions have no call recording facility)	Emergency Call Centre/Control Room	Emergency Call Centre/Control Room	Traffic Control Room-SCADA. Priority light changes for buses.	These control rooms are unconnected, and the Traffic Control Room has priority light changes for buses but not for emergency vehicles
A modernised computer aided dispatch (CAD) system due in 2019	-National Computer aided dispatch since 2015 now mapped with Eircode. -Advanced Priority Medical Dispatch System (AMPDS)	Computer aided dispatch		These platforms are unconnected. This means that each agency has no way of knowing what the other service is sending.

Radio communications (Tetra)	Radio Communications (Tetra)	Radio Communications (Tetra)	Radio Communications (Tetra)	As these are all on the same platforms there is a way to set up a channel where the services can speak with each other. However, this costs money, so it is rarely activated.
Pulse crime recording database (although not all stations have access)	Electronic Patient Care Reports			
Situational awareness technology in the control room since 2017	Situational Awareness technology in control room	Situational Awareness assumed but unsure		This real-time information allows the control room to know where each vehicle is. Unfortunately, this is also unconnected, so the other agencies have no way of knowing where the other service is.
Incident Command Truck with Wi-Fi and communications	Incident Command Unit with Wi-Fi	Incident Command Unit with Wi-Fi	Incident Command Unit	

Data Analysis Unit	Limited data analysis	Limited data analysis	-LoRa Flood sensors -Intel and Connect (TCD)-data is not shared with emergency services in real-time. -Dublinked -Dublin Dashboard -Knowledge around data analysis	The use of data in the IEMA is limited and yet, there are numerous examples of how it is being used in the city and how it could be useful for the IEMA agencies-even if that was just to share knowledge on how to effectively use the data.
Limited mapping capabilities	Limited mapping capabilities	Limited mapping capabilities	Mapping expertise both within Local Authorities and their partners	
Automatic Number Plate Reading (ANPR) although not every car has it.	-Air Ambulance-emergency aeromedical service -Ezone tool (underutilised)	Drones		
CCTV systems				
Virtual Private Networks				
Email now with 20mb of storage				

Sources: An Garda Síochána (2018), National Ambulance Service (2018), Department of Health (2018), Dublin City Council (2018), Fire Service technology sourced from interview transcripts.

So, how do we resolve this gap? Is it enough to encourage the IEMA to restructure and form a bridging assemblage with the likes of Smart Dublin

to encourage a closing of the technological gap? There are barriers to the IEMAs ability to do this such as, weak governance, neoliberal priorities as opposed to public issues, and a lack of inter-agency collaboration. Why these barriers may affect the IEMA from re-structuring and accessing knowledge from the city assemblage is evident through how they have affected the organisation and power of Smart Dublin.

Firstly, Smart Dublin want to achieve the goals that characterize smart cities<sup>18</sup>. However, their motif is to implement disconnected projects that span different infrastructures and features of the city, while working towards issues such as flooding and transport. Yet, due to their skeleton staff and weak reach within local government, they are unable to engage with the real infrastructure that enables the city to work daily. Infrastructure such as housing, education and emergency services.

Secondly, I question, whether their claim to being smart is legitimate or are they just the intermediary between the private company and the testbed space? Principally, because the claim of being "smart" cannot just be based on the implementation of technology in the city (Hollands, 2008) as it is somewhat void of meaning as "all cities want to be perceived as "smart", since the corollary was [sic] to appear "dumb" (Wiig, 2015:547). Instead, they need to be inclusive of the actual infrastructural agencies of the city to achieve the challenges listed on the Smart Dublin website (Smart Dublin, 2016b) and they also need to account for other societal issues at the precipice of people's minds such as homelessness. However, due to their weak position and projected goals of attracting investment, etc. they are more of a neoliberal vehicle for the use of profit-oriented private technologies in the city as opposed to being the driver for citizen-led development.

Thirdly, while Smart Dublin engages with companies and academics to build dashboards (Kitchin et al, 2015) and install flood monitoring sensors (Smart Dublin, 2016a), agencies within the IEMA are developing their own policy to ensure that inter-agency response is as smooth and efficient as possible. Yet, there is no direct overlap between the IEMA agencies and Smart Dublin even though assemblages have "fuzzy" borders (DeLanda, 2006) and the agencies within

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<sup>18</sup> Smart Economy; Smart Mobility; Smart Governance; Smart Environment; Smart Living and Smart People" (Vanolo, 2013:5, Caragliu et al, 2011, Giffinger et al, 2007, Monfaredzadeh and Beradi, 2015 and Gaffney and Robinson, 2016)

them oscillate positions. Thus, there is a lack of broad thinking of the advantages of merging expertise between the IEMA, Smart Dublin and private companies.

So, is there a way of resolving this clear gap between where the technology is and who needs it? No, at least not through Smart Dublin. Smart Dublin's only direct role could be as a mediator to direct the IEMA to the relevant people and to push for data to be shared between agencies, especially as it can be a leader in this area through its role as a PRA, but these are all tangible. However, Smart Dublin could be useful as a model assemblage to help re-structure and re-scale the IEMA as the shape that Smart Dublin takes as a coordinated, stream-lined but actively inter-agency-based assemblage could be replicated for the IEMA.

For example, the IEMA could learn from the Smart Dublin assemblage by reducing the number of working groups to avoid replication and the overuse of resources and by making working groups semi-permanent taskforces with a singular aim, with staff and advisors of different scales and jurisdictions. This is particularly important as it will allow the sharing of knowledge both vertically and horizontally across the assemblage as they will be able to feed upwards to the National Steering Groups but also across to the local agencies they work for when they return. In a similar way to Smart Dublin, this would help foster inter-agency trust, knowledge sharing and begin to dismantle some of the institutional siloes that characterize the IEMA.

Re-structuring the IEMA and encouraging it to work with and learn from other assemblages is one possible route to look at how weak coordination can be overcome? But it is a politically laden hierarchical approach that asks siloed and institutionalised agencies to re-think their relationship with each other and the state and it requires trust and a formalization of the system. Further, it illuminates the fact that the overall system is controlled by one sovereign regardless of the fact that these agencies believe they are their own sovereign authorities who receive guidance from the state but can do with it as they will. This would change if permanent working groups were able to adapt policy based on after-action reports in a similar manner to how Boston changed the role of the OEM post the marathon bombing. However, I propose that the IEMA needs reviewing, streamlining and de-siloing in the same manner in which Smart Dublin was created, before any real structural change can

occur because the IEMA is too informal and culturally institutionally independent for this approach to be possible at present.

Therefore, we need to explore new ways to drive change, re-structure and break down agency institutionalisation to contribute to a more efficient and coordinated IEMA. One possible route is via the adoption of smart technology in a smart way, by contributing to the breaking down of silos, encouraging the sharing of data between agencies, the development of integrated control rooms and the use of linked data so that they can see the bigger picture. A key example is the case of Rio de Janeiro who brought together all their agencies and can now manage the city in real-time and via an integrated manner as briefly introduced in Chapter two.

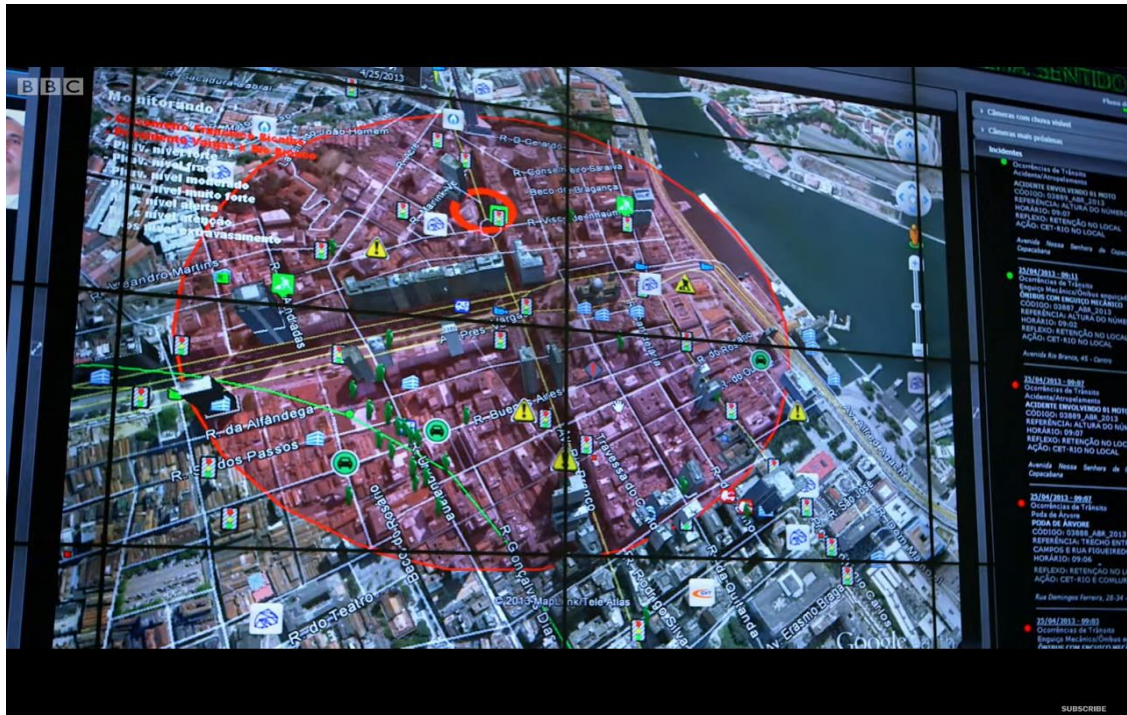
The Centro Integrado de Comando e Controle (CICC) operates as an emergency call centre and monitors traffic and is the headquarters for the city's security and operational needs. Further, it has "access to 500 CCTV cameras, 150 transit cameras, GPS and video monitoring" (Gaffney and Robertson, 2016; 18). However, although they maintain that they do not retain any data collected (Gaffney and Robertson, 2016), it is more likely that they delete some data such as CCTV and the rest is aggregated and anonymised for future analysis on trends and processes to help the city to adapt and manage events in a significantly more efficient manner.

The Centro das Operações do Rio (CRO) is part of the IBM project and is based on New York's Operations Centre (Gaffney and Robertson, 2016). It has the same functions as the CICC but also includes weather and surveillance. Further, they are the 'First Responder Coordination and Emergency Alert Notification bringing together thirty city agencies to respond in real-time to events of any scale (Kitchin, 2016b; Kitchin; 2016c; Kitchin 2016d; Gaffney and Robertson, 2016; Luque-Ayala and Marvin, 2016 and Brit Lab, 2016).

For instance, in Figure 7.2, we see a bus broken down and the red circle indicates the impacted area. Through a live feed of available resources and GPS, they know personal information about the on-scene police such as their personal phones battery life (Brit Lab, 2016).

Figure 7.2: Bus breaks down and impacted area.





Source: Brit lab (2016).

In its essence, Rio is an exemplar of integrated control centres and data-driven agencies, but it has not led to institutions being amalgamated. Therefore, the assemblage works through shared infrastructure and delivery but via separate institutions. As a result, it is an appropriate example that the IEMA could use to gain insights regarding their re-structuring while, Smart Dublin could act as a guide due to its similarities to the organisation of Rio’s agencies. However, would the application of technologies in a similar way contribute to institutional reform of the IEMA or would it only act as a band aid covering the deeper problems?

### 7.3.2 Approach Two – Institutional Reform for Meaningful Collaboration

The IEMA’s history, geography, informality, institutionalisation and relationship with the state has influenced its unwillingness to grow, share or coordinate with other agencies and their adoption rates of technological processes and data analytics reflect this. This could be rectified through the development of data rich and data driven agencies within the IEMA which would contribute towards institutional reform for the creating of meaningful collaboration by encouraging inter-agency trust, knowledge sharing and coordinated procedures and policies, but this is a somewhat utopian perspective. In reality, the creation of data driven, and technologically driven agencies is restricted by an abundance of barriers which are a)

caused by the current informal, institutionalised and siloed IEMA and b) emanating from the actual use of data and technology itself.

To fully understand how these barriers, actually affect and restrict the smartification of IEMA agencies and the potential for institutional reform in a meaningful way, a detailed examination of the only IEMA agency with a professionalised data analysis unit, An Garda Síochána, is discussed. The use of data analysis within NAS and DFB will be referred to but at present, they are at an earlier stage of implementation and professionalisation and only beginning to face the same issues of AGS. Further, the analysis of AGS is positioned alongside insights from Boston, particularly BPD, as both are good examples of approach two in action. This is due to a longer history of technological growth producing much more advanced data driven agencies resulting in institutional reform between agencies and the community.

#### *Garda Síochána Analysis Service*

The Garda Síochána Analysis Service (GSAS) began in 2007 with the hiring of civilian personnel, as data analysis was being conducted on an ad hoc basis and required professionalisation. This does not suggest that data remains uncollected and under analysed by other agencies. The National Ambulance Service use data to reveal certain trends and knowledge around response times and turnaround times for example,

“We are continually producing data, but it would be the likes of how many emergency calls did we receive in Waterford last night? What was the length of time on average between receiving the call and arriving?” (Representative of National Ambulance Service).

The difference is that GSAS, as a professional body, ensures the accuracy, quality, ethical use of data and scale of analysis in a way that cannot be ensured or completed by the other agencies. For instance, the limited data analysis conducted within Dublin Fire Brigade emanates from

“a business intelligent system. We have as part of our control centre we have a level of scrutiny and gathering of information so at any given time I can tell you how many flood calls we have from last year and the year before using a

business intelligent system. We can drill down into the actual fire reports so each response results in what we call a fire report, although the fire report is probably a misnomer, it is more of an incident report as there may be no fire. So, that level of data is there. There is no great sharing of data” (Participant ID13).

Thus, DFB collects some data through this model, and they are able to produce rudimentary reports. However, as this is conducted on an ad hoc basis by senior officers, there is a lack of expert knowledge which could contribute to the professionalisation of the data analysis. This would result in DFB being able to explore different trends, check for and ensure good data practices and essentially be able to use the data to inform more operational practices.

The closest to a professional data unit like GSAS is within the NAS who are “continually producing data” and have an informatics department whose

“sole role is to produce this data, there has to be a reason for producing the data [sic]. There are quite a number of people within the greater national ambulance service and the HSE who want to know how many maternity cases did you have last night? What is the relevance of that to anybody? You would have to have a good enough reason for asking that question” (Participant ID16).

Although this appears as a close contender with GSAS, its role is not to check or interrogate the data, it is simply to take the raw data and answer particular questions when asked. It appears to be a basic data entry system with limited information available. Data is not analysed unless there is an appropriate reason unlike with GSAS who use the data to inform operational and strategic decisions and as a tool for collaboration at the local, regional and national scale. Yet, the scale of GSAS is small in comparison to the overall size of AGS and its operational scales. It has grown slowly due to being “ stop, start because of the recessions and the economic crisis, but we have grown to about 45 people now and we are actually launching a recruitment campaign tomorrow for another 25.” (Participant ID33). So, what barriers are GSAS facing in trying to institutionally reform to become a data-driven agency?

### *Barrier one- The Pulse Database*

The Pulse database, which is the main platform for recording crime, is outdated:

“It is a very closed wall system there. They are working within the constraints of the Pulse system which I think when it went live it was already outdated. So, they are very limited in what they can do there.” (Participant ID35)

This results in three major issues with Pulse. Firstly, it is not integrated with the computer aided dispatch system, as a representative of AGS explained:

“The computer system in command control is from 1989 so there is nothing smart about that, in fairness it is a good system, but there is no link with our Pulse system or anything like that. I mean that would be a start.”

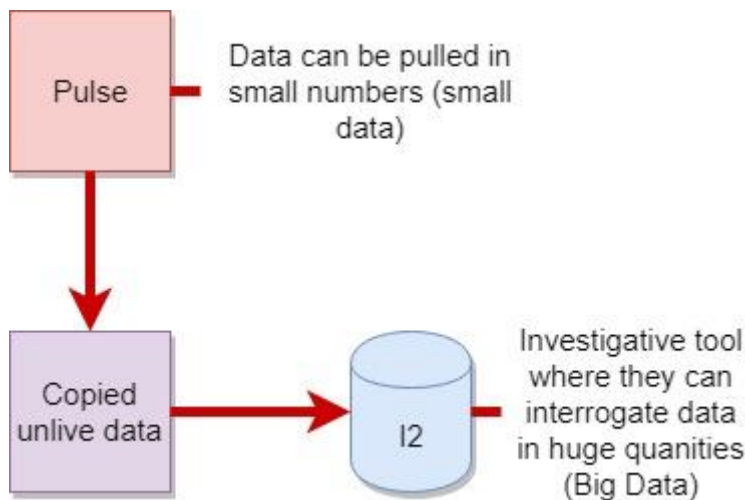
Therefore, there is the needless replication of data across two systems. This links to the second problem of data accessibility. Even though it is available in two places, both are outdated and are essentially just data input systems. Therefore, how data is merged within datasets and what the user is told about that process incites whether the data can be trusted as discussed by ID33:

“**Respondent:** The thing with Pulse is it has very much been designed in such a way that it is about data entry and record retrieval, but you can only retrieve X amount of records, about 50 records is the maximum you can retrieve. But even then, you are looking at files on an individual basis which means that if you want to aggregate it all up it is useless. So, Pulse for us, it is useless, but for an individual officer who just wants to know about you, it might be fine because you are retrieving a record of an individual. [...] So, when we arrived [GSAS] here one of the things we did was try to put in place a new infrastructure. So, if you imagine this is the Pulse screen, but then there is Pulse data. What is happening is you cannot really interrogate the data to the full extent through that screen. That is the problem. So, all we did was we created a new repository of data and...”

**Interviewer 2:** So, you built your own data infrastructure essentially.

**Respondent:** Yes, and onto that, we actually sat our investigative tool which is called I2. [see Figure 7.3] [...] So, what we did was bring that across, copy the Pulse data so we are not working off the live system, that is the other thing, so we have a copy of our database there which we are still developing. Now that allows us to interrogate the data in a very different way to your average guard, which allows us to actually produce all those reports that your average guard can't produce”.

Figure 7.3: Process of re-building data infrastructure



Source: (Participant ID33)

As a result, there is a still a distinction between who the data users are in AGS, meaning that aspects of the agency are attempting to be data-driven, while other aspects are continuing to police in a traditional manner. The argument for this separation is that the average guard is not adequately trained in data processing and analytics due to funding and resource restrictions as discussed by participants ID27/28

“It possibly depends on the scale of the emergency or the duration of it, but the Garda analysis service is a relatively new section and only probably quite recently sufficiently resourced. So, they are allocated to the various regions and to the specialist units and to particular major investigations and they are a civilian expertise that comes in and can assist with that type of data analytics when it comes to volume and crime investigation and analysing mobile

phone records and things like that, areas like that. Increasingly relevant and increasingly useful but when it comes down to individual districts and crime and burglary trends in one particular station that is more of a local level analysis and that is about time and capability to do that sometimes. But there is potential there. Looking at it in terms of emergency management we could potentially see its use in ongoing crisis if it was a zombie apocalypse or something like that.”

This is an adequate explanation as to increase skills, resources, plans and training to forward the smartification process would require a substantial cash injection and the hiring of externally trained staff. This reason can also be replicated across the other CMAERA agencies.

Thirdly, with Pulse remaining a data entry platform with limited scope for evaluating trends and patterns, it is harder to share information between agencies. Of course, GSAS can offer assistance, but this means that for a broad range of information to be shared outside of AGS, the request first must be escalated up the hierarchy which, in the case of a major emergency could prove timely and inefficient, as opposed to a system where superintendents could access this data from local stations and share immediately with the relevant agency. So, what does barrier one mean for institutional reform in a meaningful way?

An Garda Síochána are being studied because they are the only agency in the IEMA which has formally started to become data-driven with the other agencies engaging with data in a limited manner. However, as demonstrated above, due to all the agencies collecting data and operating on similar but unconnected platforms, it is possible to allow for data sharing within the AGS and between other agencies, but they do not utilise it

“Now to say that is not very fair because we do use the same technology, our voice communications, our network, the Guards and ourselves and the fire service use the same platform, so we could in theory communicate very easily with one another.” (Representative of the National Ambulance Service)

Further, their platforms strike a resemblance to the siloed characteristics of the agency itself and by not overhauling the system and creating meaningful connections between all AGS platforms, but instead allowing GSAS to create their own data infrastructure as an alternative suggests that the institutionalisation and historical culture of AGS is not transitioning easily. This is combined with the National Ambulance Service who overhauled their CAD system in 2015 and moved from sharing a control room with DFB to their own siloed control room, thus, within two decisions they missed a chance to attempt to engage with other agencies through their new platforms and they removed an inter-agency face-to-face communication (National Ambulance Service, 2018).

“The control room for the whole Dublin area was in Townsend Street and that sort of command and control where they take the emergency call and they dispatch from there so it would have been in the one control room. DFB on one side of the room and us on the other side of the room. Now we have moved out and this is the national control centre [...] And the control centres then, yes there would be a difference because they wouldn't start to know one another know so it is only through phone calls” (Participant ID17)

Thus, as the other agencies are working within similar technological boundaries and platforms without the foresight to set up their own ‘GSAS’, efficient collaboration and coordination cannot be the outcome. Instead, these agencies will remain silos with limited potential for real-time inter-agency data sharing “because we do tend to fall back into our own small silos, whereas we worry about our own end and we just need to be communicative a bit more” (ID17).

### *Barrier Two – Data Quality*

Data quality is a major concern as it needs to be high quality, have strong metadata and information regarding its veracity, lineage and provenance<sup>19</sup> so that the analyst can ensure that any findings stemming from the trends are probable, have minimum errors and reflect best practice. When the garda entering data does not understand these requirements Pulse, and other platforms, very quickly, become systems of different 'sites of practice' where the data is shaped in particular ways due

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<sup>19</sup> Data veracity is how reliable the data is, lineage is where it came from and provenance is how it has been used, manipulated or changed overtime.

to cultural and political priorities, i.e. a garda wants to upload his/her/their notes on a crime while, GSAS want to use the data to notice trends, create reports and influence policy. Further, what is missing from GSASs online presence and the interview is an explanation of the data's journey from start to end, through its intersections, replications, deletions and mutations in conjunction with a deep exploration into why, and in what context the data was shaped. This could help to understand the advantages and disadvantages of data analysis within the agency especially as it re-scales based on priorities, cultures and politics. This issue is particularly notable within the NAS and DFB too, who are collecting and analysing the data in a limited manner without any clear consideration for the data's lineage, providence or veracity. They ask particular questions of the data without acknowledging any potential errors or biases within it by not ensuring that the raw data is collected and analysed carefully and done so with expertise. So, what does barrier two mean for institutional reform in a meaningful way?

By black-boxing the journey of the data in this way, it is harder to promote the shift towards data-driven decision making both within the agency and across the IEMA as there is a lack of understanding on how the data is used and shaped (Bates et al, 2016). This is further compounded by the fact that AGS has poor data governance making it even harder to encourage Gardaí, even trained Gardaí, to fully engage in providing good quality data from the beginning.

“Now the quality issue is a big one. Once data was actually being entered into the system, I don't think people thought about the quality element of it at all. And I think the quality issues have really begun to emerge over the last few years to a greater extent because of what we do here. All of a sudden, we are now churning data at a rate of knots, we are not looking at 10s of records, we are looking at 100,000s of records. And a question was asked of us and when we go and look at the data, we find that sometimes we can't answer the question because of the way the data is structured or the way that the data is completed. And so that has led to issues and problems and it is being accentuated by the fact that once we started to have a look at it the governance, we found that the organisation has poor data governance. So, you don't actually have one person responsible for data quality.



So, what are we doing about that? [...] So there [will be] a chief data officer job and the governance has got to be put in there. And then that is where we are going to have to look at the business and begin to talk about data quality. Because data quality isn't absolute. You don't say this is data quality. What you say is, what is it that you want to do with the data? And once you know what you want to do with the data that is where you can say this is the shape, these are the minimum data quality thresholds” (Participant ID33).

### *Barrier Three – Algorithmic Governance and Accountability*

Algorithmic governance refers to the change in how we are beginning to manage society through big data which is being collected through a number of interconnected technologies and personal devices (Danaher et al, 2017). Further, as algorithms, which are a set of instructions to solve an issue, become more complex and begin to merge with processes of machine learning and artificial intelligence, the algorithm can transform based on the data it analyses (Donadea and Almeida, 2016). The development of algorithmic governance has the potential to change policing fundamentally, but it is being met with strong resistance in Ireland and a sort of pseudo-resistance by Boston Police Department. BPD argued that they do not engage with predictive policing, but intelligence led policing as there is concern that predictive policing is inherently biased. Even so predictive policing is already occurring in police forces in the US such as Chicago PD (Jordon Jefferson, 2018a; Karppi, 2018) but it is being approached through a critical lens in Ireland as discussed by ID33, who has concerns around quality of data, accountability, algorithmic decisions and biases along lines of race and income.

In terms of predictive policing, An Garda Síochána have “issues with machine learning which need to be resolved [...] before we can go down that route.” One of which is the biases that these algorithms produce. ID33 provided a recent example from Durham who used artificial intelligence (AI) to determine if people should receive bail or not. Instead, it categorised people by address and subsequently, class and wealth:

“So, Durham police used AI recently in order to triage whether people should receive police bail or not. It was a system whereby personality, on the basis of the algorithm if the person came with a high risk, they wouldn't get police

bail, low risk they would get police bail. But as they began to have a look at the data points that determined the algorithm, the outcome of the algorithm, one of the data points was postcode. So, people in poorer areas seem to have high risks, so irrespective of whether you were that person or not, all of a sudden you were being punished by your postcode area. And we also have to be mindful that within the UK minority ethnic groups are over-represented in poorer areas. So, you could actually be having a form of indirect discrimination as well. So, all of a sudden, the way that this algorithm was working was it actually treating all people equally? So, AI, great to talk about delivering value, but it has to do it within the values of the organisation” (Participant ID33).

So, what does barrier three mean for institutional reform in a meaningful way? Firstly, it is ensuring that AGS are considering accountability within their data and how it could be used to socially or economically segregate people as illustrated by ID33 who questions

“Who is accountable when you are running AI? Is it the programmer? Is it the person who made the decision? [...] Is it the person who said that this is the direction we should go in? If somebody decided on that basis and was wrong, who is held to account? And that is an issue that we haven't resolved.”

This refers back to the institutionalisation of policing, which historically have ingrained scales of discrimination and if the process of accountability is unclear then the algorithm may contain discriminative characteristics which could “create a feedback loop” (Participant ID33) because:

“we have problematic information in our systems, to begin with, and let's be honest within many jurisdictions across the world policing has been quite repressive towards certain groups and communities. And we have certain groups and communities overrepresented in the databases and intelligence within certain police forces. And if you are going to sit AI on top of that and feed off that data the danger is you are going to actually create a feedback loop. So, who has figured out the data quality thresholds in that sense? Who

has considered the possibility of perverse outcomes when you start sitting AI on top of your data?" (Participant ID33)

By recognising the often-ingrained discriminatory practices of traditional policing and their replication within data, it requires AGS to soften their approach to becoming data driven. However, through this decision process there is a recognition of toxic cultures within police forces, which need to be overcome before algorithmic governance can truly be a beneficial addition to policing rather than a tool of segregation. Thus, in terms of algorithmic governance it is not necessarily the technology itself which can lead the way towards institutional reform but the conversation surrounding its ethics and data accountability contextualised within the agencies own history, culture and practices. These conversations force agencies to discuss deeper issues such as institutionalisation and toxic cultures so that the legacy and veracity of the data can be considered before it is used to inform policing decisions.

However, even if the deeper institutional issues are recognised, their applicability and contextualisation within the data is hindered by a lack of training and a data culture within AGS and other IEMA agencies as described by ID33,

"if we are actually asking people to make decisions off the back of an algorithm, they have got to understand how that algorithm works. You cannot be in a position where you are making decisions on the basis of saying the computer says yes or the computer says no."

Officers need to understand the decisions, understand the veracity and lineage of the data, the source of the data and its quality and reliability and these are not skills which An Garda Síochána have as they are still trying to overcome "the organisation[s] poor data governance".

Boston Police Department is an example of the type of institutional reform that can emanate from these types of conversations as participant IDM describes an almost soft form of predictive policing by arguing that they use intelligence-based policing. However, the difference between intelligence-based policing and predictive policing is that they do not use algorithms to target broad

areas based on discriminatory data, but by taking into account conversations around history, geography, recent crimes and other contested factors as explained by IDM:

“I wouldn't say we are predictive policing, and I don't even know if I believe in predictive policing, we are an intelligence-led policing department, so we do highlight patterns and trends. If we have a rash of robberies here, we deploy resources, there. So, our deployment decisions are based on data that come out that we generate. If there is gang violence... Most of our violence is driven by gangs and it is retaliatory in nature. So, if I have a shooting here and I identify the victim and I know this victim is a gang member I can anticipate where the retaliation is going to be. So, we have a group of officers [...] tasked to go out and try to either prevent that, find out some information, gather some intelligence so we can try to prevent that retaliation. If we can get some information in, okay this kid who was just shot, his brother we know just got a gun and we can try to prevent that next shooting. Or we keep an eye on these guys if we think they are going to retaliate. So, we are intelligence-led. We monitor patterns and trends; we deploy our resources accordingly. We have city-wide units that we can take from there and put here to help problem solve on certain issues. But the thing with predictive policing is that you take out the human component of it. People are unpredictable” (Participant IDM).

Critically though, as described by former Boston Police Commissioner Bill Evans, certain areas of Boston have always been discriminated against and that Boston does have a history of racial abuse. Thus, based on this short description, it is hard to accept that the algorithms used by Boston Regional Intelligence Centre (BRIC) do not contain some biases and geographical areas of discrimination due to the histories of certain spaces and the institutional knowledge passed down generationally which can inform how data is collected and its veracity and lineage. To minimise the effects of discriminatory or biased practices within their usage of data they approach accountability through CompStat, which as explained by IDK is

“an accountability type of environment, we don't do a confrontational CompStat, not like some jurisdictions in the country do, it is not

confrontational. Every other week, so we have 11 police districts, so every two weeks two districts will be reporting so the captain will come in with his staff and it is expected that he will know everything, and we send it to him from the BRIC [...] So, you will know what your patterns and trends are, you should be on top of it, not just for CompStat, honestly, all the captains really do stay very involved because just the way our command structure is, the superintendent of the captains knows everything that is going on in the city. So, if he calls and says what is going on in this rash of robberies you had better really know when he calls you.

So, our captains are really... So, it is an accountability thing and it is to make sure, and it is to also highlight best practices. So, if this particular captain is having a rash of burglaries and this is what the MO looks like, rear door entries, and this captain who is sitting in the audience says, 'I had that a couple of weeks ago and this is what we did, we arrested this person, but he is out on bail now and he lives...' So, it is to exchange information, highlight best practices, some kind of collective problem solving and accountability that if there is something going on and the commander's kind of sit in a U and we can ask questions of the captain. Did you think about doing this and what about this? But usually, it is more of an exchange of information and stuff'.

This demonstrates good inter-agency coordination and networking and could be deemed an interesting method towards encouraging inter-agency collaboration. However, even though Ireland is questioning accountability and needs to formalise and create better inter-agency coordination, they argued that CompStat is a neoliberal process of data analysis and data sharing that is overly linked to targets rather than changing cultural standards. Thus, it is just an added layer rather than an effective tool of institutional reform.

“So, for example within CompStat, CompStat is a business process that has tight loose principles. So tight in the sense that you have a clear vision and create targets to achieve, loose in the sense that you have actually devolved responsibility down to commanders, to drive that. But linked into a data-driven approach. So that is how the commanders want to use it. They want to use it to monitor performance, but down on a local level it is that kind of

analytical driven approach to try and understand the problem and to put solutions in place. And part of that would be identifying problem areas” (Participant ID33).

However, where Boston’s assessment of predictive policing demonstrates institutional reform in a meaningful way is when they re-humanise policing and the use of data as illustrated:

“We don't buy it here yet, they haven't proved... You can't take out human behaviour. A lot of crime is opportunistic, it is committed by people who are not really thinking that hard about it, it is a crime of opportunity. They walk by, they see this car, this car is unlocked, they see shopping bags in the back and that is what they do. So predictive policing, for them to say the odds are that you will have another car break here, we kind of already know that because that is where all our car breaks are so why are you telling me?” (Participant IDK).

Or, how Bill Evans described the importance of community policing in managing crime. He argued that creating relationships with all communities was essential for the gathering and sharing of information after crimes, for building trust between communities and the police and that by organising the Boston Police Department ice cream van and flashlight walks and other community-focused events it meant that the police were now seen as guardians rather than warriors of the community. He furthered this by promising to meet with relevant community leaders post a police shooting of a member of their community to ensure open lines of communication and an adequate explanation as to why this action was taken.

This type of policing does not rely on predictive policing instead it relies on the human interactions and relationships in a positive way but as IDK explained, in an almost Agambien way, humans have a providential will and no algorithm can predict that. It’s human nature to be opportunistic and predictive policing, even combined with the type of community policing described, can never really overcome this.

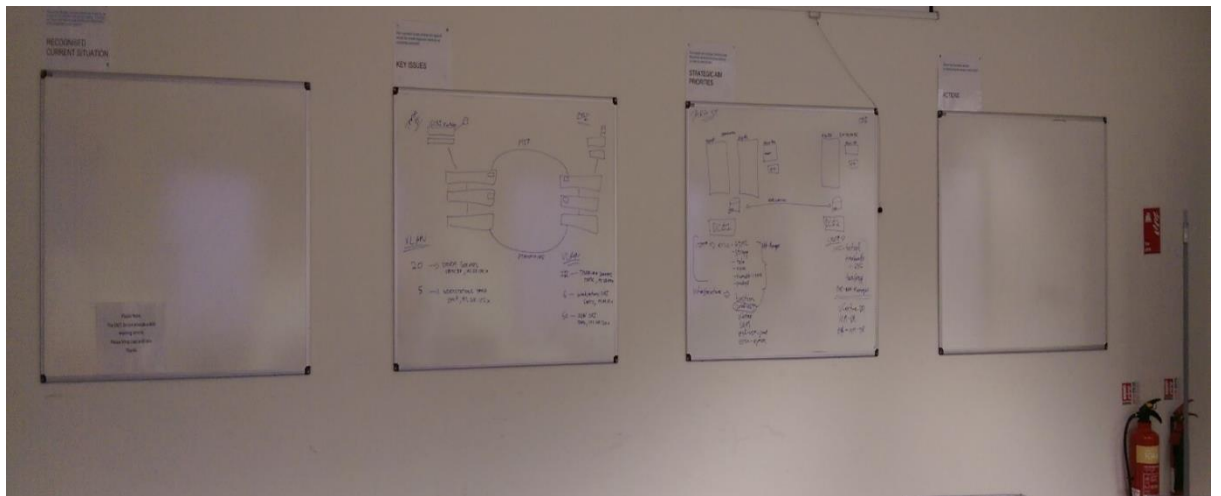
“A lot of crime is opportunistic, it is committed by people who are not really thinking that hard about it, it is a crime of opportunity. They walk by, they see this car, this car is unlocked, they see shopping bags in the back and that is what they do. So predictive policing, for them to say the odds are that you will have another car break here, we kind of already know that because that is where all our car breaks are so why are you telling me?” (Participant IDK).

#### *Barrier Four – Resistance to Change: Control Rooms*

Barrier four, shifts the focus away from AGS towards the wider IEMA through a discussion on outdated coordination centres/control rooms which should not be confused with the emergency call centres. These control rooms are activated during emergencies in Local Coordination Centres where information is shared via phone and is inputted on four whiteboards (see Figure 7.4), as described by ID05

“Well, we use the same thing for managing a system, we use a system called Information Management and we use that so that people can break down large chunks of information and analyse it and make evidence-based decisions on that. That is, it there, it is still on the boards. It is a system on four boards that all agencies are trained on now and it is a very effective tool. We tried it electronically, but it just didn't work”.

Figure 7.4: Four whiteboards in a Local Coordination Centre



Source (Author)

This is compared to the BRIC from BPD who have their own dashboard that provides specific sensitive information, like law enforcement sensitive, that can't be seen by everyone. The BRIC control room uses digital platforms connected to city cameras, sensors and other technologies to ensure the quick sharing of information and a more efficient, uniformed response during an event. Data analysis is a key aspect of this control room as “we send out all the statistics that have occurred within your last ten week reporting period, because we report every ten weeks” (Participant IDK).

In Ireland, as there is a lack of a digital platform for the management of data or the sharing of information there is no need for a data analyst during emergencies further discouraging agencies from the professionalisation of their data management as described by ID33.

**Interviewer 1:** So, you wouldn't be in the National Coordination Centre, say during Hurricane Ophelia or something.

**Respondent:** No.

**Interviewer 1:** You wouldn't have an analyst represented there?

**Respondent:** Not that I am aware of.”



This is furthered by a lack of insight into the need for a digital platform such as WebEOC<sup>20</sup>, knowledge of the Ezone tool or the need for a data analyst as described in a conversation with ID26:

“Absolutely, national incident coordination, that is what I am telling you, we have one, and we have a bloody good one here and if we can get people to understand that, we give a lot of our time trying to persuade people that that is what is here. And as I said to you the piece about it is our four-board system is really at the core of this and the challenge to people with technology is to take what is an excellent four board system, it needs this, it needs a black marker and you could run Ireland here.

And that is what we have done here and that is all you need if you use that system, but it is much more about in your mind really, that this is what we are trying to do. And we have done what you are talking about, we have done it at a national level. Christ, there is a big flooding down there, we need to move this, or we need to... What can we do here? And the great thing about having everyone around the table, when people hear the stuff going on, without me going around saying has anyone anything else to say? People put their hand up and say we actually have stuff here we can do this, or we can do that. And the other piece about that is for me the nightmare is someone else saying, oh you give us this or you do that. That just doesn't work in reality, that is a recipe for rows. A big part of coordination... [...] A bit part of the experience for me of coordination is managing rows, rows between services, rows between agencies, very understandable, you do get a serious situation.”

So, what does barrier four mean for institutional reform in a meaningful way? The language in the above quote is suggestive of resistance to change. The experience of the participant is that the four-board system works, that technology will not improve that or inter-agency coordination as the crux of efficient coordination is managing people. This is accurate as demonstrated during the Boston

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<sup>20</sup> As described in chapter 5, the WebEOC is an online emergency operations centre and crisis management system which supports the sharing of real time information between agencies with regards to resources and other response mechanisms.

Marathon Bombing as the Unified Command Centre could not manage all the police officers who arrived, and it descended into chaos. However, a platform such as WebEOC allows for a smooth transition of knowledge and information, it provides a permanent record, creates data for analysis and its description by IDG is reflective of a digital four boards:

“Some of them are [connected] and some of them are, they have different boards, one might track only shelters, one webpage of this application, only shelters and another one tracks all events listed by transportation agencies and there is a way that those two things could be melded together, or you could say Boston has a WebEOC shelter board and the state has a WebEOC shelter board, but they are not displaying the same information even though they could”.

Thus, the WebEOC creates a seamless flow of information from senior officials (in the control room) all the way to operational staff. They can interact with their staff on the ground, with other agencies in the EOC and follow inter-agency developments through the WebEOC. Although there is the equivalent of an EOC in terms of Local Coordination Centres, the flow of information between and within agencies relies on the upward sharing of information from the ground via phone and there is a lack of interest or understanding in the benefit of a system such as WebEOC or even the utilization of the Ezone tool. This, with the lack of a data analysis in control rooms during events, illustrates the resistance to change within the IEMA which does not exist at the same scale in the USEMA. The positives of a digital platform such as “If everyone is trying to use the same tools so we can have the same operating picture” (Participant IDG) should outweigh the fears and reluctance to change. Instead, this resistance to change demonstrates a lack of awareness around the need to progress and modernise and can only hinder true institutional reform both technologically and culturally.

#### *Barrier Five – Resistance to Change: Inter-Agency Data Sharing*

The reluctance to share data, emanates from the same fears and resistance to change as barrier four illustrated. Participant ID33 argues that these fears are based on a lack of knowledge and legacy as "I don't think within Ireland we have a culture of sharing data." However, this is not uniquely an Irish issue, as data

sharing between agencies in both Ireland and the US is restrictive with concerns around privacy, misuse and institutional protection. But, in Ireland, it was more concerning that emergency response agencies seemed to collect data but not assign any importance to such or any analytical insights because:

“All the data we would have here is locked down, is inaccessible, we cannot download it, but we can view it and obviously, people could photograph it if they want or something like that and that is one of the reasons, we don't let mobile phones in the room” (Participant ID16).

While, Participant ID35 argues that “Some agencies feel that they have ownership, complete and total ownership of the dataset and releasing it or anything like that for collaboration feels like we are giving away the farm as it were. They no longer have control over this data.” Further, how data is shared and organised is often overly difficult, bureaucratic or numerous agencies have different parts of the dataset:

“I would really, really agree with that. For the Ezone tool we had for example, data on the schools around Ireland so if an incident happened, we would know it is this school, they have X number of people on their roll, this is the roll number and so forth. Sometimes it is very hard to find complete datasets. If you went looking for a list of all schools in Ireland there maybe is a couple of different agencies you would have to go to, no one seems to have master lists of things. And in other cases, for example, the ESB Networks, that took six months of legal back and forth to get power line information just to put it on the map to stop the helicopters crashing into power lines. The big problem there, the big issue that they had was it was the HSE requesting it and they had to make sure in legal terms that the HSE would not use census data or other data to start comparing health conditions with location or proximity with power lines” (Participant ID35).

This form of data protection<sup>21</sup> is a key concern in Ireland which is also hindering their ability to share data as explained by ID33:

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<sup>21</sup> It is interesting to note that even though the IEMA agencies are reluctant to engage in data-driven methods they are recognising that they are collecting huge amounts of data that need to be protected

“So, there was a range of problems, so you could actually share information on that, on that basis. Now within an Irish context I think there is a greater concern about the whole issues around data and data protection and so you can't share, it has been impossible to share data at an individual level. Although we can get individual data but only as part of the investigative process and not a big batch of people's individual data. So, I can ask about your records in terms of your accounts if we are investigating you, but what I can't ask for is everybody's accounts within that particular area. So, at an individual level, it has been difficult to share that data. At an aggregate level, we can share data. [...] I am actually an advocate of data and data protection and I can see the real importance of it but at another level, I think we have gone too far, and we have a very firm data protection commissioner here who probably enforce the rules quite strictly.” (Participant ID33).

However, ID31 explains, that regardless of the parameters set regarding the ethical use of data, the PRAs should be able to adequately share data, even vulnerable and identifiable data, if it is for the common good especially as data protection is already being breached. Thus, ID31 argues for a system that would allow for the data to be shared but the access tracked and audited.

“There is a data commissioner there which is going to impose restrictions or protocols on the agencies and through the government in any event. I have no issue, I think from a major emergency or from a big event situation I think the three agencies need to be syncing and have available data. I think they are all professional agencies, they have their own internal protocols of secrecy and of data restrictions and who it can be passed onto. For a major emergency, I would have absolutely no hesitation saying we should share that information. It should be available as I said from the one call coming in, to recording that we share that information.

So, I don't see an issue because information is fine, but information is time critical in the emergency response area. I fully accept there are safety issues

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by law. Thus, individual agencies have prepared their own data protection plans under the ‘General Data Protection Regulation’ (GDPR) which are easily accessed via their web pages.

and sensitive issues and there is restricted information, but we are probably the HSE/Guards really would be the two agencies involved in the sensitive type information. From the point of view of criminal activity or from a sexual type, the HSE are dealing with child issues and other sensitive issues. Fire not so much because they are really going to the site. I wouldn't see having a common system each would have access to maybe on a tiered level that obviously going up the ranks to the senior responder has better access. And if you have a footprint inside in the system then if it is released it can be looked at to see who accessed information. You can see from where social welfare have had issues of people looking up at their accounts and the Guards have had issues with the Pulse system, so it is actually out there. But there are possibilities of restricting it. There are possibilities of looking down the road if someone breaches it, so I would have no issue. I think from a major emergency point of view it doesn't make sense not to share some key information” (Participant ID31).

There is a lot of work that needs to be done on data protection across all agencies, not just the IEMA, and until these agencies begin to fully engage in data analytics and data sharing, substantial inter-agency data protection protocol will not occur. So, what does barrier five mean for institutional reform in a meaningful way?

Although the Framework and some IEMA agencies have been working for decades to break down the siloed legacies and build inter-agency relationships, the advent of big data and algorithmic governance is putting the spotlight on an aspect of their agencies which has retained its independent silo characteristic. However, as ID35 argues:

“this is changing, the attitudes to that are changing. There is the open government data which is making brilliant strides and more and more agencies are now thinking we can actually do this, it makes sense, there is a collaboration there. But there is a lot of older style thinking, depending on the efforts they might have gone to collect this data they just simply wouldn't think of giving it away for free”.

He centres his argument on the growth of open data which will be supported by projects such as Building the City Dashboard, by GSAS and because inter-agency data sharing is beginning to occur in Cork as evident by Participant (ID32) who sees the benefit of such for the development of inter-agency coordination:

“But because of the inter-agency training down here and the amount of training that we do there is good data sharing, even technology at conferences. (Participant ID32)

It is these small changes which will encourage the IEMA to slowly become data-driven due to the emergence of open-data and ubiquitous technology, However, its institutional reform will be hindered unless the key barriers of institutionalisation, weak governance and informal practices are overcome. Otherwise, the shift toward a smarter IEMA will only further illuminate and embed these problems.

#### 7.4 Conclusion: The smarter IEMA?

So, what does all this mean for the IEMA? Should it undergo smartification to become data-driven? Is it really the solution? Will it, fundamentally, re-shape the assemblage?

The answers to these questions are still highly complex, but I argue that the IEMA needs to undergo some form of smartification to be able to function in line with greater society. However, the IEMA actually has more serious issues around toxic cultures, institutionalisation, awkward power dynamics, and it is too informal to encourage strong inter-agency coordination. Therefore, both approaches offer methods for increasing inter-agency coordination, but are restricted by a reluctance to change. Thus, the smartification of emergency management assemblages is a slow burner and somewhat idealistic as they face the same issues which have held back or created toxic institutional cultures in the past, meaning that it is not really a solution as much as it is a band aid:

“I think before we even get there it is the culture of the organisation. You actually have to try and shift people's ways of thinking. When you start shifting people's ways of thinking, that is when they will absorb and take on a

data-driven approach. So that is where you have to spend a bit of time sitting, listening, understanding what their dilemmas, what their problems, what their issues are. And then feed information, tailor that information to their problems. And so, show that the analysis that we produce has utility for them and that they can apply it. And once they see positive outcomes beginning to emerge from that, it moves their thinking from saying my gut tells me to do this, to actually the analysts, I know now that they know so I am going to go to the analysts. So, the first and foremost is to get your end users on board, to change their way of thinking about analysis, because you could actually have the most stupendous dashboards, they can be beautiful, they can be amazing, you can do 101 things with them but if they are sat out there while business is over here..." (Participant ID33)

However, by only homing in on the cultural aspect of the agency, as a separate process of becoming a data-driven organisation, illustrates a narrow path which lacks scope by disregarding the need to contextualise other information including experience. These agencies operate through path dependent protocols, they have decades of institutional memory so, changing how they inherently police or respond to an event is a major task and it can only succeed by truly understanding the informalities, tensions and legacies of the agency through careful observation of inter-agency operations, training and officer experience.

If the IEMA becomes data-driven this, would fundamentally, re-shape the assemblage as the sharing of information would be quicker and more efficient while, the use of platforms and integrated control rooms may become more of the norm, resulting in a flatter assemblage with less need to oscillate towards a hierarchical position as decisions and responsibilities would be very clear and non-debatable in this scenario.

I recommend that the IEMA need to observe the benefits of the USESMA's adoption of data-driven techniques and technologically based tools such as WebEOC and more generally, the benefits of dashboards, integrated control rooms and inter-agency data sharing in order to help reduce resistance to change and potentially weaken the silos as agencies begin working together on technological projects and data sharing initiatives. However, this would require stronger, more

persistent political will and governance to break these siloed institutions and to lobby for a re-structuring that moves the IEMA from being highly informal to becoming formal with aspects of informality. Further, this should lead to wider thinking on how the IEMA can become more inter-connected with other urban agencies as the importance of this growth is described by IDA;

“And so, I am not engaged in the direct emergency response work, the goal is by doing this work and our focus that we have, that we are able to help improve the way that that happens. So, a lot of the data that I am collecting is for decision making around what are the best approaches. [...] Yeah so, they have a pretty good relationship and mainly the relationship comes out of a process like sharing other information with stakeholders. I think the challenge is there isn't a repository of where all those people are in Boston, we are assuming it is the same way, but there are sources to give that data. And so being able to figure out how to leverage that for good decision making to do wellness checks on folks, particularly if they are electricity dependent”. (Participant IDA)

In summary, technology is not the solution for creating better inter-agency coordination or changing how the assemblage may re-shape between policy and activation. Instead, it is part of the solution alongside the restructuring of the IEMA, with a focus on talent and the effective use of resources within working groups. But neither of these approaches will be effective until the institutional silos of the IEMA and all CMAERAs are broken down as this is a critical step forward in the creation of a true CMAERA.



## Chapter 8: Conclusion

### 8.1 Introduction

This concluding chapter, discusses the findings and contributions of this thesis as a whole, including its meaning and implications for hazard studies, assemblage theory, the emergency management discipline and the IEMA and USEMA. It begins with a brief summary of the position and contribution of this research to Geography and the research design including revisiting the aims, objectives and research questions. It then synthesises the key findings and identifies three wider contributions to hazard studies, assemblage theory and the effects of urban processes on assemblage oscillation. Finally, it ends by identifying multiple future research avenues and a final summation of the thesis.

### 8.2 Summary of the Research

Despite the enormous work which has been conducted on hazards, disaster management, risk and vulnerabilities, there are significant gaps with respect to understanding coordinated and managed response to events. As geographers, we should begin to look beyond socio-economic vulnerabilities and risk and question the politics of different spaces and places and how their response networks form, operate and are controlled. We need to understand how CMaERAs are shaped, how policy is created and how it is operationally used alongside our traditional understanding of the vulnerabilities and risk.

However, we do still need to continue approaching hazard studies through social vulnerability, the effectiveness of engineering projects, the role and influence of the risk society and the development of resiliency but this should be done in conjunction with all elements of hazard management. The above approaches deal with hazard prediction, preparedness, mitigation and management but apart from resiliency, the discipline does not engage with the recovery aspect effectively. Even though resilience studies look at community and government preparedness and lessons learned, there are limited geographical studies on the emergency services which are key for recovery both in the immediate aftermath and longer term. Therefore, I set an agenda for the geographical study of emergency management and coordination in terms of a focus on the recovery element of an event resulting in one

key research aim. It aimed to understand how CMAERA organise, re-shape and are influenced by broader factors such as urban and state governance, history, geography, (in)formalisation and institutionalisation and whether these are affected when the CMAERA begins engaging with data analytics and governing via algorithms. This aim was broken down into four workable objectives informing the research question.

**Objective 1:** Describe the emergency management systems of Ireland (Dublin and Cork) and the United States (Boston, Massachusetts) in terms of their policy (Chapters 4-5).

**Objective 2:** Evaluate why CMAERA agencies may oscillate away from the designated policy shape into different real-time response shapes, as a reaction to the type of the event, (in)formal relations and power dynamics. (Chapters 4-6)

**Objective 3:** Explore some of the cultural and political reasons these systems can fail, such as inter-agency tensions, formalisation, weak governance, geographical exclusion, institutional resistance, training and funding (Chapter 6-7).

**Objective 4:** Assess the relationship between CMAERAs and technology, data analytics and algorithmic governance to better understand the impact of them on the evolution of CMAERAs (Chapter 7).

The main research question was:

How do the variety of actors, actants and technologies involved in emergency management contextualised within their particular histories, cultures and geographies, assemble and organise?

### 8.3 Key Findings

Providing a narrative and close examination of the different structures of the IEMA and USEMA, proved essential for uncovering the reasons why CMAERA oscillate away from policy-based shapes to real-time activated shapes, but it also helped to provide a perspective in which to study the potential effects of ‘smartification’ on CMAERAs. Thus, Objective 1 was examined between Chapters 4 and 5 and the research reported in these chapters found, that US emergency management policy produces a system which is a highly formalised, legal

and an unyielding system, which retains its power by controlling funding streams within legislation. Beneficially, the more formalised system ensures that methods and institutional knowledges, pre-determined resources, assistance and funding streams are all in situ and ready to be activated quickly. However, impervious formalisation also results in very weak informal networks which hinder the growth of inter-agency trust and collaboration.

Meanwhile, in Ireland, the policy is much more informal due to it being supplanted on top of historic loose networks, meaning that the system is not framed by any legal frameworks or undercut by funding streams. However, because of the looser more fluid system, the IEMA is able to be more flexible and adaptive in the face of major events but processes of decision-making, access to funding and declarations of emergencies are much more difficult to obtain than in the US.

By comparing the CMaERAs in line with their policy description and their re-shaping during activation, the reasons why a CMaERA may oscillate between policy and activation as described across Chapters 4 to 7 and explored under Objective 2 became visible. The flexibility and fluidness of CMaERAs is not adequately reflected when studied via only one ontological understanding as, the empirical case studies demonstrated that hierarchical and flat ontologies do not adequately represent CMaERAs as they neglect to account for contextual factors that affect how assemblages are shaped in policy and re-shaped during activation. Thus, this thesis proposed a middle-based ontology which offered a deeper understanding of the internal and external factors that shape and encourage oscillation of a CMaERA.

For instance, the USEMA has a superficial flattening and decentralisation of power networks at both the local and regional scale, where each scale has authority over their own agencies, structures, organisations, processes and leadership. However, at the federal scale the system oscillates away from the flatter, organisation (Foucault, 1977/1978) of the local and regional scale, to a more hierarchical position with one ultimate sovereign (Agamben, 1998; 2005; 2011). Local agencies provide information to the state and it is the state governor which will request federal help if needed (this is often done in communication with the local scale, but it is not necessary). If federal help is awarded, then FEMA and other

federal agencies such as the FBI or DHS take over responsibility from local and state agencies. Of course, there are exceptions to the rule, as was seen during stage 3 of the Boston Marathon Operation, where the FBI allowed Bill Evans of BPD to continue in his leadership role. However, this is an exception not the rule as the stringent federally enforced hierarchy is linked to funding. This means that even as local and state agencies operate independently at their scale, in order to ensure they will be entitled to funding if a major event occurs, they concede authority to federal policy and their directives. Thus, the USEMA is superficially flat with no ultimate sovereign power in a Foucauldian sense but realistically hierarchical due to the reliance that the local and regional scales have on the federal scale coercing them into implementing federal guidelines and procedures.

Meanwhile, the informality of the IEMA creates a structure which is mainly decentralised and rhizomatic with an attempt to place a more formal hierarchal structure over it via policy. The formation of policy such as the Framework, which aims to formalise the system does not actually deal with any of the significantly entrenched problems of the IEMA agencies and their willingness to actively coordinate and embrace change. By ignoring contextual issues such as an agency's history, geography, institutionalisation and state relations, agencies forge their own paths and procedures as they internalise state policy and activate it in agency appropriate ways.

The effects of this can be seen due to the fact that Irish emergency management policy is unlegislated, resulting in each agency retaining their right to internalise policy as they wish. There are no legal or funding ramifications for ignoring or changing policy in line with their culture and this reflects the stubbornness and resistance to change that was characterised by a lot of the participants. Thus, the IEMA is a superficial hierarchical system that actually operates in a flatter decentralised way. Yet, in a similar way, to the US, the IEMA has an ultimate sovereign (An Taoiseach) providing the illusion of a formal structure. The informality of the IEMA encourages agencies to make clear public declarations without the Taoiseach's approval i.e Met Éireann weather alerts. Therefore, there is a blurring of informal and formal practices in Ireland which is not evident due to the formalised inter-jurisdictional and hierarchical scale in the US. This creates difficulty around ascertaining the role of a sovereign, as simultaneously

there is one ultimate sovereign and multiple embodied sovereigns (Foucault versus Agamben) in place. This affects how the assemblage re-shapes during different events supporting the theoretical idea that assemblages cannot just fit neatly into one ontological position but instead are messy, transitioning, and difficult entities to fully understand.

At this point, it is obvious that the two assemblages are structured differently but both still oscillate between policy and activated shapes. So, Objective 3 questioned why. Clearly, the (in)formalisation of the CMaERA is a contributing factor to how it oscillates, but there are other factors that deserve attention also. Firstly, an abundance of issues around path-dependency and agency histories refer to the evolution of emergency service agencies as historically independent from one another. As a push for inter-agency and inter-jurisdictional coordination has come to the forefront of effective emergency management since the 1970s, agency cultures and institutional cultures have created tensions around how decisions are made, and policy is created. This combined with weak governance, either from the state or within agencies, resulted in geographical exclusion in policy writing (Ireland) or clear inter-scalar and inter-jurisdictional boundaries around funding (USA). Further, as political priorities have changed, particularly during the shift from welfarism to neoliberal entrepreneurial practices, funding and training resources for public services became tighter, reducing the capacity of these agencies and affecting the relationship between agencies and governments as seen with the NAS and DCC. All of these factors, and more, encourage the CMaERA to be designed one way and activated in other ways as they produce different levels of trust, priorities, power dynamics and histories which in turn affect how the assemblage may re-shape.

Of course, not all agencies are resisting change or allowing these problems to constrain their ambition and future growth. For instance, the Office of Emergency Management in Boston and the inter-agency office in Cork have emerged as pinnacles of success in positively interacting and working with other agencies while others are still participating but in a weaker more protective and reserved manner. This results in inefficient coordinated responses but as the OEM quoted “as one agency shows the benefits more will follow with time”.

Finally, Objective 4, primarily focused on the IEMAs (potential) relationship with technology, data analytics and algorithmic governance as examined in the previous chapter. The clear finding was that the broad issues which are inherent to CMaERA are so deep that technology will not be the solution, but it can act as a driver towards change. However, the IEMA needs a structural overhaul before it will be fully effective as a CMaERA or can embrace the benefits of platforms such as WebEOC, inter-agency data sharing and more integrated control rooms.

But in what way can technology drive some change with regards to the IEMA? I found that the resistance to technological change resulted in the IEMA being reluctant to accept the benefits of systems such as WebEOC or the usefulness of sharing data. In the US, they have control rooms known as Emergency Operation Centres (EOC) which have key personnel from each agency<sup>22</sup>, representing and working with their agency, with other agencies and updating the WebEOC. The WebEOC creates a seamless flow of information from senior officials (in the control room) all the way to operational staff. They can interact with their staff on the ground, with other agencies in the EOC and follow inter-agency developments through the WebEOC. In comparison, Ireland has the equivalent of an EOC in terms of Local Coordination Centres, but the flow of information between and within agencies, relies on the upward sharing of information from the ground via phone. Thus, it became apparent that the slowness of inter-agency information sharing and the resulting slow decision making, and response processes frustrates both operational staff and the public. If there was a platform that forced agencies to begin to share real-time information it, potentially, could begin to break down some of the institutional barriers and create a more formal procedure. So, are technological fixes and methods of data analytics, appropriate ways of creating strong inter-agency coordination within CMaERAs or are they just band-aids covering deeper political and cultural issues?

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<sup>22</sup> Depending on the scale that the EOC represents it may consist of local/state/federal police services, fire departments, emergency medical services, FEMA, Department of Homeland Security, Defense Forces, Public Health, relevant government departments, Mayors office, Governor's office, Red Cross, National Guard amongst a medley of other agencies.

Technological fixes and methods of data analytics are appropriate drivers for helping to fix some of the deeper political and cultural issues, but they are not the entire solution. Firstly, the IEMA will become data-driven. These agencies are already collecting data and conducting minor analysis on it. Regardless of the resistance of the IEMA towards data analytics, the embeddedness of ubiquitous technologies and the development of algorithmic governance will be a disruptive force for the agencies of the IEMA forcing them, at some point, to reconsider their stance and to begin to become data-driven. The processes of data analytics will reshape the assemblage. It will change the power dynamics between agencies and will be a key facet in how the assemblage oscillates between vertical and flat positions. At present the siloed data infrastructure allows for some limited sharing positioning the agencies in a hierarchy, but as open data and dashboards prevail, the power will change, and these agencies will operate on a flat plane. Aggregated data and trends will be easily sourced; although the hierarchy will remain in terms of raw data due to the sensitive nature of it which will be highly regulated under data protection.

Secondly, the use of WebEOC positions the agencies in the US in a flat position, as information and requests can be shared in real-time and it is a tool of coordination, not power. Any agency with access can speak and be heard, the hierarchy resumes when you position the agencies without access, such as NOAH or other community-led or voluntary groups.

If Ireland adopted a digital platform the shape of the assemblage could oscillate away from a forced hierarchical shape towards a flatter shape. By using the four-board system described in Chapter 8, there are still archaic hierarchies in place, as the information is shared to the senior officer on the ground then up to the Local Coordination Centre and then placed on the board and shared with the other agencies. Whereas, a digital platform allows for immediate real-time information that can be recorded and stored and observed by those not in the Local Coordination Centre.

Thirdly, algorithmic governance and in particular, data analytics will change the shape of the assemblage and it will cause them to oscillate in new ways as the use of data creates new power dynamics and responsibilities. However, until the culture changes and it becomes a standard to be as data driven as in the US,

the re-shaping will remain hypothetical and based on what has occurred previously due to other cultural tensions both in policy and during an event. Thus, the smartification of the IEMA is not an appropriate method for overcoming issues of institutionalisation, (in)formalisation and political will and governance but instead, it will play a critical role in the future of these agencies and potentially, could be a contributing factor to solving aspects of the above issues.

#### 8.4 Wider Contributions

This thesis contributes to wider academic knowledge in three ways.

##### 8.4.1 Contribution One: Expansion of the term ‘Vulnerability’ within Hazard Studies

The concept of ‘vulnerability’ is contextualised in terms of a disciplines philosophy and theory (Wisner, 2009). For instance, in ‘Hazard Studies’ it is conceptualised in terms of the scale of trauma and destruction after an event or in ‘Climate Change’ it is used to explain the exposure and risk of global warming to Earth and society. What all disciplines agree upon is that the scale of an individual or communities vulnerability is directly correlated with their social capital.

Therefore, the overarching conceptualisation and discourse of vulnerability is in relation to the social production of wealth, disempowerment, political representation, ethnicity, race and gender amongst numerous other categories. These risk factors for increased vulnerability are normally identified during pre-disaster phases of planning and mitigation. However, when governance networks do not operate properly because of friction a new idea of vulnerability develops as management processes are ineffective and often discriminatory in terms of language, undocumented migrants and geography.

It is the complex and often contradictory governance of CMaERAs operating at different response scales (local, regional and national) and between each response scale that results in inadequate inter-agency coordination and contributes to slower and less efficient response indicating a need to reconsider what vulnerability means post-event, as assemblage theory maps vulnerabilities and identifies where the CMaERA is failing and succeeding. When this is combined with an analysis of the vulnerabilities developed post event through the CMaERA, it becomes apparent that



its definition and use needs to be expanded beyond a disaster i.e. the identification of vulnerabilities that develop post-event due to the CMAERAs performance.

#### 8.4.2 Contribution Two: The Development of Embodied Assemblages

By recognising the need for the expansion of the definition of vulnerability, it directed the research to continually look at the categories within assemblage theory. Thus, throughout the body of this thesis, I have loosely referred to the idea that assemblages are in and of the world and cannot adequately be abstracted from reality. Assemblage theory has a tendency to polarise ontologies between flat and hierarchical positions both in policy, but especially in practice. Embodied assemblages refer to the continuing oscillation of assemblages and their entities into new shapes due to different factors such as history, culture and geography. Therefore, I propose a middle ontology with no ultimate sovereign but multiple scales of powerful leaders as power is distributed in unequal and unstable ways. In this way, assemblages are always embodied, and the real ontology is in recognising that an assemblage is a fluid and flexible entity which may be shaped flat or hierarchical in policy and in reality, may oscillate between these positions based upon various reasons, places and times.

For instance, during normal conditions, CMAERA tend to be flatter even though policy would suggest they retain their hierarchical positions. However, as resources are more restricted, inter-agency sharing ensues and trust is developed as agency personnel tend to work or communicate with the same people. However, during a crisis, emergency management tends to become more hierarchical with the sudden re-centralisation of power to the national stage and the attendance of the 'ultimate sovereign', An Taoiseach and the President of the United States. At face value, this suggests that they now have ultimate control and decision making but in reality, they are public figureheads who make announcements based on the experience of the multiple agencies and embodied leaders who operate on a daily basis. It is for this reason, that I do not recognise one 'ultimate sovereign' but multiple scales of powerful leaders because, even as a figurehead, they are operating in line with the advice of others. It is this idea that contributed to the evolution of a family of concepts emanating from the empirical work and briefly illustrated in Chapter 2. In particular, imagined assemblages emanated out of the discussion of sovereignty and the role of state leaders during major emergencies.

An 'imagined assemblage' is a term I have coined to reflect the natural human characteristic to self-discipline in line with societal values. Foucault (1980) discusses this idea under the concept of biopower where "power manifests itself in the form of daily practices and routines through which individuals engage in self-surveillance and self-discipline, and thereby subjugate themselves" (Pylypa, 1998: 21). Merging the concept of biopower with assemblage theory contextualised within emergency management practices, results in the production of imagined assemblages. Imagined assemblages form when responsibility and dominance are re-imagined as someone else's based on perceived power and hierarchy. This perception stems from how societal order is produced and maintained by the formation of "docile bodies" through churches, schools, family and government (Foucault, 1980a:139 and Pylypa, 1998). In practice, this occurs when there is a presumed sense of dominance and submissive power relations which, may or may not, actually exist in that space. A powerful person can change how the hierarchy works as people reflect on their role and tend to re-position and subjugate themselves towards the perceived power in the room. Imagined assemblages bend policy and reality to form this quasi-perception of truth and knowledge which contributes to a distinction in absolute power and that power is everywhere, to instead view power as something that splinters and bounces and contributes to the oscillation from policy assemblage to imagined assemblage to the activated assemblage.

The concept of splintering and bouncing are the next set of factors which emanated from the empirical studies in line with imagined assemblages. The idea of splintered or splintering power builds on Graham and Marvin's (2001) idea of splintering urbanisms and combines it with Foucault's idea that power is decentralised and everywhere. Graham and Marvin (2001) define splintering urbanism as the ability for infrastructures and technology to create fragmentation throughout the city often resulting in the polarisation of urban spaces. Foucault's idea of power is everywhere, meaning that power is yielded by many institutions in different ways, suggests that power is episodic in nature rather than continuous resulting in decentralised but pervasive power which neither wholly stems from structure (assemblage) or agency (individuals/groups) but from a combination of both. This episodic nature of power creates the networks that reposition assemblages and agencies from flat to middle to vertical as the power becomes fragmented in a

similar manner to the urban. In the case of the IEMA, we see splintering power as the assemblage re-shapes by sharing power and responsibility with auxiliary services such as the Defence Forces, the Coast Guard and the Civil Defence and other voluntaries. In policy, these agencies are invited in by either a Local Authority, an Garda Síochána or the Health Service Executive (HSE) before they can activate. However, once activated they are often given numerous different roles of responsibility from the lead agency. It is in this regard that top-level power begins to be splintered on the ground with normally powerless agencies now benefitting from the decentralisation and pervasiveness of power.

However, this power still creates polarisation as the lead agency and the national scale are always the sovereign with ultimate responsibility and power. Thus, Agamben's idea of the 'King rules but does not govern' is essential for understanding splintering power. Auxiliary services may be encouraged to assert some power during an emergency, but they are never the rulers or final decision makers.

A consequence of splintering power is that power bounces. CMaERA policy creates epicentres of power in the form of coordination and control centres. As the power is decentralised across agencies, and away from the epicentre it dissolves and re-emerges in local spaces with new regimes of power supported by local knowledge and informal networks. Bouncing power is less about structure and agency and more about the informalisation of emergency response even in highly formal systems like the USEMA as power tends to bounce between first responders with a working history together and is a critical part of inter-agency coordination. This family of concepts contributes to our understanding of power as more complicated, elusive and mobile than argued in assemblage literature. They represent the bridge between codified power and actually existing power which may or may not align with policy.

Thus, CMaERAs force you to consider a middle ground within assemblage theory as you cannot adequately and earnestly study assemblages as merely hierarchical or flat as this nullifies and ignores the deep complexities of urban and social assemblages and the reasons why they oscillate. This contribution to assemblage theory offers future researchers a set of analytical tools to study

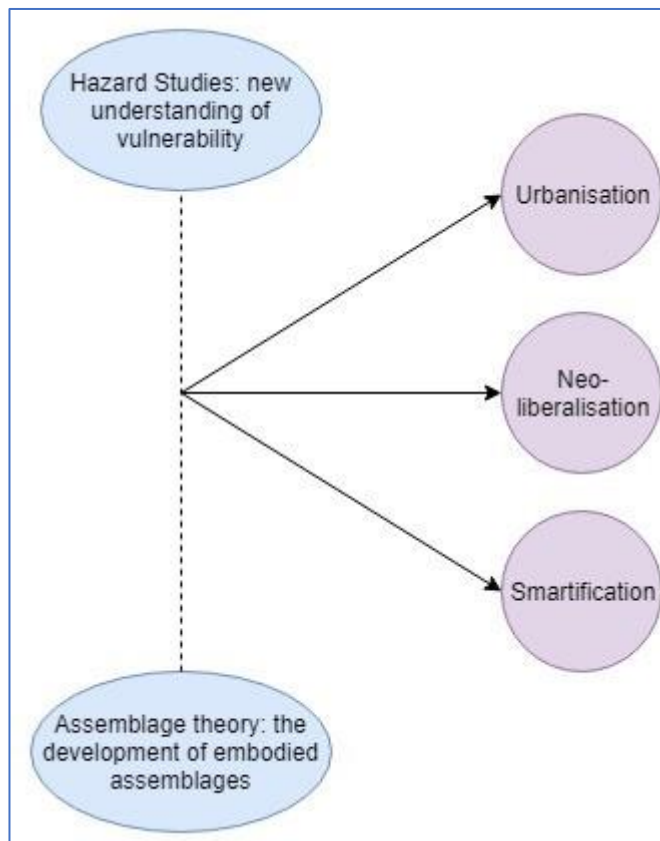
assemblage theory in a more enlightened and informed way as it encourages the ontology to be less about a position and more about embodied context.

#### 8.4.3 Contribution Three: Urban factors Affecting Assemblage Oscillation

National agencies refract through cities as policy and decision making contribute to the efficacy of how CMaERAs are often developed and practised within urban environments. However, the efficacy and different morphology of assemblage, change over time due to different factors, and history does not automatically lead to change, so what is taking a pre-emptive rule in structuring how these CMaERAs oscillate?

To approach this question, in line with the above contributions and as a result of early research findings, the two anchor bodies of literature were crosscut with three secondary works of literature; Urbanisation, Neoliberalisation and Smartification, see Figure 8.1. These pieces of literature were carefully selected as they emanated strongly from the empirical research. However, these are not the only urban processes that affect how assemblages oscillate. Others include, resilience, financialization, population growth and a medley of other processes, which simply did not fit within the scope of this thesis based on the general empirical findings.

Figure 8.1: Bodies of Literature



Source: Author

The selected bodies of literature were studied in terms of two basic questions; firstly, does urbanisation and neoliberal policy affect how oscillation occurs in assemblages and influence how they operate within urban spaces? Secondly, in cities that are both neoliberal and smart, how does this influence how assemblages are shaped and oscillate?

Urbanisation aggravates assemblages and makes governance networks more complicated, while also making the job of CMaERAs and their oscillation much more difficult. Urbanisation results in the re-planning of hazardous zones such as floodplains for residential and commercial building as evident by New Orleans and Irish planning regulations. There is a much wider and entrenched division of wealth with poorer areas often residing in much more hazardous spaces as discussed by Pulido (2017) in terms of environmental racism.

Further, urbanisation is bolstered by neoliberal policies which further increases the wealth gap and leads to austerity conditions where public services, such as CMAERA, are being continually affected by resource cuts, recruit and training cuts and salary cuts. However, the biggest impact that neoliberal policy is having on CMAERA is the privatisation of agencies and/or parts of services. For instance, in the United States, private ambulance services work alongside public agencies but in some cities such as Quincy, MA, they are the only ambulance service. This creates vulnerability in the response stage as only certain sects of the population will have adequate healthcare insurance covering ambulance transport. Meanwhile, the poorer citizens must choose between the potential cost of an ambulance or whether they can make it to a hospital on their own. As was recently discovered during the California fires of November 2018, private firefighters were hired by the wealthiest of the community to protect their houses and land, while public firefighters and prisoners from the Californian Judicial System responded elsewhere (National Union of Public and General Employees, 2018). Thus, there is a clear divide in how wealth also helps during and post an event to minimise vulnerabilities. This privatisation of first responders is, at the moment, reserved for certain states, cities and towns in the US with Ireland not currently engaging in this element of privatisation.

However, neoliberal policies affect IEMA in different ways with households unable to attain flood insurance due to certain zones placed around houses, and the government taking the rhetoric that they cannot interfere with the market. Therefore, they engage by using state funds to help the recovery processes. This is a uniquely Irish form of neoliberalism as coined by Kitchin et al (2012). Neoliberal policies accentuate the voice of companies and the wealthy and silence the voices of the poorest and most vulnerable in our society and this translates into how CMAERA oscillate, as when funds and staff are restricted then they are more likely to be flatter to ensure adequate resources between the agencies. However, under neoliberal policy and urbanisation, there tends to be more tension between parent departments and agencies making communication much more difficult. For instance, neoliberal policy tends to create more target driven structures which makes jobs much harder particularly for emergency services, as it only increases the pressures these agencies and their staff are under. This is further compounded when

salaries do not meet the job requirements, incentives are minimised, job losses occur and when recruitment ceases or is limited. These issues affect the efficacy of CMAERAs as they must operate within new but tighter constraints while also aiming to achieve particular targets or response times.

Smartification of urban spaces should have rectified these issues and made the city safer and more equitable according to its key visions but, as discussed in, Chapters 2 and 7, it has created more urban polarisation. Essentially, the blueprint for the smart city is utopian and as of yet, it has not fully percolated into the urban fabric and particularly not into CMAERA agencies in any meaningful way. However, it has resulted in re-defining the role and type of governance being enacted on urban spaces. There is a shift between discipline-based governance and control-based governance whereby, the use of big data and algorithms are shaping how cities and people are managed. In light of this, CMAERAs are beginning to engage with data analytics, some more than others, and I propose that this "data revolution" (Kitchin, 2014c) could influence the practices and processes of CMAERA overtime. Thus, I propose that the current trajectory of smart city research as critical and citizen-led needs to also examine the effects of smart policy and data analytics on public services. As CMAERA continues to be influenced by urbanisation, neoliberal policies and the smartification of the city, it will continue to oscillate between hierarchal and flat positions, but data analytics will disrupt these oscillations and potentially change how they are organised and re-shaped between policy and activation in ways that cannot be fully understood at present.

#### 8.5 What Lessons Should Stakeholders Draw From The Research?

There are seven key lessons that emergency management stakeholders the IEMA, USEMA or any other CMAERA could draw from this research.

1. In order to create a balance that allows for efficient inter-agency response, supported by quick accurate sharing of information, the US could weaken its formalised and militaristic structures, while Ireland could increase them. I suggest that by weakening the formalised procedures it could allow for more informal relationships to develop. This may result in greater inter-agency trust and collaboration in the US. By formalising the IEMA procedures,

institutional silos may begin to breakdown, as agencies will be required to internalise policy as it is written, while collaborating and coordinating with other agencies in a more efficient manner.

2. The negative public connotations that surround data collection and analysis, especially regarding data and police forces, should be marketed in a more positive manner. For instance, public demonstrations on how data can be a method of hazard prediction in local areas should be conducted, unsensitive data should be open and included on various dashboards, citizens should be able to easily access any data held on them or their property and the methods for collecting and analysing data should be transparent, fair and open to investigation. In both the US and Ireland, these provisions should be included in key policy and legislation and open to the public to read. This would encourage trust to build between the public and emergency services, particularly the police and the building of excellent community policing relationships as demonstrated by BPD. If trust is built between these services and communities then when a major event occurs, it is easier to collaborate and work with the community and gather sensitive information which may help in the recovery process.
3. Ireland needs to consider legislating emergency management policy and connecting funding to same to ensure that the key principles of emergency management are upheld, namely: preparedness, mitigation, preparation, response and recovery. At present, there is no defined funding source for response and recovery in Ireland. Instead, it is conducted on an ad hoc basis, with limited information during a crisis as to whether Local Authority and/or emergency services extenuating expenses will be reimbursed. Further, by not legislating emergency management policy, each agency is within its right to engage or disengage from different policy documents. This can create difficult inter-agency relationships, tensions, repetitive work, power battles amongst other detractions from a successful response. As a new Framework is in development, there is an opportunity to place it before the Dáil and Senate and request for its implementation into legislation. In this regard, it would force agencies to break down their institutional silos, follow the described roles and responsibilities, remove inter-agency tensions (to a certain extent personality will always be at play), encourage inter-agency



collaboration and could also create a mechanism for response similar to, but not as extreme, as the US i.e. following the legislated protocol could result in more defined funding streams.

4. Ireland should recognise the considerable number of working groups and national steering groups that develop emergency management policy and procedure as they all appear to do similar work, and this process could be made more efficient. Resources and brain power could be inputted into the system in a better, more efficient manner if the overall system was more streamlined and talents and resources were adequately utilized. If staff was seconded from key agencies to work on a particular project within a set time frame rather than having several working groups with the same representatives, then talent could be harnessed, new ideas may emerge, and knowledge sharing networks could be broader. This would occur because talent would be better utilized, there would be more inter-agency communication across different scales rather than just from the same middle to upper officers and knowledge would be shared upwards to the national steering group but naturally outwards to their relevant agency upon their return.
5. Both systems should consider the position of each agency within the emergency management assemblage. There should be a reflection on whether each agency is situated and networked properly, whether the power dynamics are overpowering or over weak, and whether the importance of some agencies need to be re-evaluated. For instance, Ireland should consider promoting the Coastguard from an auxiliary service to a Principle Response Agency as they are the main response agency for coastal crises. This would shift their position higher up the hierarchy of emergency management. Meanwhile, the US should reconsider the position of immigration voluntary services in response situations, as they have the community relationships and language to engage with frightened legal and undocumented migrants whose first language is not English. Having these voluntary organisations work alongside the first responders can help the emergency services share messages, gain information and respond to emergencies more efficiently.
6. The growth in data analytics is producing a shift in how the city is governed and how policy needs to be written. It should reflect the changing

technological standards of the city and the strategies in place to create a smart city and encourage greater inter-agency collaboration and coordination through the aid of technology such as linked control rooms and data sets. It would be at this point that a de-siloing would become evident, not just on an operational level, but on a material and strategical level. This, of course, has downsides as highlighted by the research participants who were concerned with issues of privacy, security, control creep and data deluge.

7. By recognizing that the techniques of governance are shifting there should be a will within local government to engage with CMAERA in so far unseen ways. A city is smart because it uses its limited resources in unique and innovative ways that produce efficient and positive results for the city and its citizens. A city is not smart just because it is branded as such and has implemented elements of innovative technology. For example, ‘Smart Dublin’ and Boston’s ‘Office of the Chief Innovation Officer and the States Mass IT, as well as Metro Boston, which covers numerous municipalities, could be mediators in helping CMAERA engage with knowledgeable actors who may be able to help these agencies to connect up with urban real-time information such as traffic and water levels etc. Again, this could be made possible through a platform such as WebEOC and the promotion of inter-agency data sharing.

Promoting and normalizing inter-agency data sharing would quicken the response and coordination of activities between the Principal Response Agencies and "other" agencies in times of crisis. This growth in data sharing could also evolve into the development of inter-linked control rooms. The majority of participants have argued against the one-size fits all control room as developed in Rio de Janeiro (Gaffney & Robertson, 2016) but indicate that “control centres should be in one room” (Representative of emergency service) as there is value in connected, but independent, control rooms as it could create a more resilient and inter-connected system that could facilitate better response and coordination in times of crisis. Simply, they see the value in a “combined control room for fire, ambulance, police, so it’s a total multi-agency control centre like which exists in Europe” (Participant ID13). However, they do not want to give up their independence. Thus, they want a control room that can harness inter-agency relationships such as those

that developed when the NAS shared a control room with DFB (as described in Chapter 7) but they do not want to all work from the same integrated technologies. I propose that their reluctance to limit inter-agency control room integration is because of the external factors of institutionalisation, political will and governance and (in)formalisation discussed in Chapter 6. They are siloed, resistant to change and have their own cultures which they wish to maintain.

## 8.6 Future Research Avenues

This thesis has opened the door to numerous new research avenues particularly for those interested in taking their skillset and applying it to a new theme. I propose ten potential foci of future research stemming from the thesis analysis:

1. An evaluation of CMAERA in Coordinated Market Economies in developing and underdeveloped countries with a focus on indigenous knowledge versus their interaction with western influence and 'help'. Much research is placed on the western developed world which benefits from long histories of emergency management, but local knowledge is often neglected. Further, some of the poorest regions on our earth experience the deadliest disasters mainly because of increased social vulnerabilities (Boyle, 2015) but response is often a combination of local emergency management practices and indigenous knowledge and experience. Thus, it would be interesting to explore the response to flooding in a developed, developing and undeveloped country and note the differences in response networks based on different types of experiences, knowledges and priorities.
2. If there is a language barrier between key response agencies, media outlets and migrants this creates a vulnerability which can result in the hazard becoming even more disastrous for this sect of the population. This is combined with other social vulnerabilities that migrant communities tend to face in urban spaces such as lack of resources, representation, healthcare, education and safe housing. Language differences should never create vulnerability, it should never result in adequate information not being shared and obtained by these communities both before, during and after an event. Therefore, what procedures and mechanisms need to be put in place to ensure that every urban dweller will receive and understand what is going on and

where is safe? This would also need to be combined with a conversation on undocumented migrants who may fear presenting at evacuation centres. Policy needs to be put in place to offer protections to these people for instance, to re-utilise a term by Agamben (2005) in a positive way, evacuation centres should be ‘spaces of exception’. Evacuation centres should be allowed to care for everyone, ID them to ensure the safety of everyone, but that information should not be shared with police services.

3. How will cross-border emergency management be re-shaped in Ireland post Brexit? At the moment, there are cross-border policies which allow emergency services but, particularly the Police Service Northern Ireland and An Garda Síochána, to cross the border during active duty. There are also communities whose closest emergency service or hospital is across the border. In the event of Brexit and a hard border or no Irish back stop, it will be more difficult to negotiate cross border emergency management services and communities could face longer waits for emergency help and/or travel to hospital. Cross border emergency management research was completed by Murphy et al (2016) and McClelland and O’Keefe (2014) and could be used as the framework to analysis any major disruptions and changes to service post Brexit.
4. How will emergency management evolve under the ‘Trump effect’ in the US? The full consequences of the Trump presidency requires these questions to be examined over a long period of time exploring funding streams, immigrants (legal and undocumented), policies etc. combined with various in-depth questions. These could include;
  - Whether presidential declarations for major emergencies are issued to ‘safe’ cities<sup>23</sup>?
  - How do police practices and cultures change?
  - Is there an evident increase or decrease in gun crime, terrorism (domestic or international) and epidemics etc.?
  - How are the emergency services supported in responding to increased levels of hatred and violence?

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<sup>23</sup> Safe cities refer to US cities which are willing to ignore federal policy and protect undocumented and legal migrants

- How do inter-jurisdictional relationships survive under scrutiny from the Presidential office?
  - Will there be considerable differences in response to major events due to location, culture, wealth, ethnicity etc. as was seen in the response to Puerto Rico versus Hawaii in 2017/2018?
  - How will emergency management policy change at the federal scale?
  - How will the deletion and removal of climate change data, funding and the assertion that climate change does not exist contribute to major emergencies in the US and the efficiency of response under these more intense and extreme circumstances?
5. A longitudinal study on the adoption rate of technology and data sharing in the IEMA noting how it affects the shape and if it contributes to reducing some of the key issues mentioned in this thesis. As the IEMA agencies begin to adopt technology and become data-driven, it will be interesting to explore if these technological adaptations affect their cultures, institutionalisation, informalisation, inter-agency coordination and collaboration. Further, does it change how the public engage with the IEMA through social media and emergency apps?
  6. How will the development of wearable technology and ‘Internet of Things’ change how emergency services are able to respond to people? Will they be able to use these technologies to locate you, read your vitals, get a history, learn of any existing conditions and as a method of identification? This could be a radical transformation in early medical care, in search and rescue operations and in the identification of criminals.
  7. As emergency services become more data-driven, how are they going to work to protect the data and the privacy of the individual? What are the ethical requirements of collecting or using data on an individual? These questions are already being explored with regard to predictive policing but if point six were to happen or just with the data they collect in general, what processes do they need to undertake to protect the individual? General Data Protection Rules (GDPR) will go a long way to protect a person but a certain times, certain data will need to be shared outside the agency, so what

mechanisms are put in place to do this? For example, one issue was raised by participant ID06.

“You could live in a neighbourhood and you want to move people to designated rest centres and again there is a coordination, you need to know who is going in there. You need to be looking at it. If you have family and children, we need to know who else lives in the area, are they on the sex offenders register before we put them in”.

8. A deeper exploration into the benefits of a fully integrated control room versus one room with all the control rooms. This would include an examination of several control rooms across the world to evaluate what works best under what circumstances, cultures, economies and social set-ups.
9. A mapping of all governance networks in Ireland to understand where they diverge, and merge i.e. do the governance regions of AGS match those of the HSE? This could help to illustrate why there is a misalignment between agencies and government departments and that often datasets or information are spread across different agencies.
10. Emergency Management as a discipline needs to re-structure around theoretical and conceptual work as opposed to around practice. There needs to be a more in-depth exploration as to what the discipline of emergency management can offer the academy and how it can integrate more fluidly with other disciplines rather than simply using their theories. It needs to develop a philosophical foundation and define several approaches or schools of thought on how to study emergency management. However, this needs to be done in conjunction with its role in, informing emergency management practice as that is an important cornerstone of the discipline and emergency management protocol worldwide.

### 8.7 Final Summation

So, in the end what does this thesis tell us about the variety of actors, actants and technologies involved in emergency management assemblages and how they are shaped by particular histories, cultures and geographies? CMaERAs are complex, multi-faceted, institutionalised networks of agencies, people, processes, technologies, histories, geographies and cultures and all of these

different elements affect how strong its inter-agency coordination, response and influence is. However, the beauty of a CMaERA is that it is fluid and flexible, it can expand, retract and re-shape to ensure the best possible response based on contextual and situational awareness. By trying to frame this idea, I was faced with a lack of theoretical rigour within the emergency management discipline, which resulted in an interesting merging of philosophies, theories and disciplines.

By adopting assemblage theory and applying it to the two CMaERAs (IEMA and USEMA), conceptualised within Foucauldian and Agambien understanding of power and sovereignty, this thesis offers a theoretical and philosophical framework to study emergency services and their interactions and power dynamics while keeping in sight their histories, cultures and current situations i.e. the influence of technology and data practices. It was the use of a modified assemblage theory that provided this space. By removing the ontological boundaries but recognising that structures still exist, it became apparent that this helped to frame how CMaERAs operate and re-shape from policy to activation. CMaERAs do not remain within a hierarchical or flat position instead they move to ensure that response is adequate and efficient. However, these movements are influenced both by the situation, inter-agency trust, previous working relationships but also from external factors such as the institutionalisation and siloed manner of agencies, whether they are formal or informal, their relationship with the government but also human nature. These broad factors affect inter-agency coordination and collaboration and idealistic proposals suggest that technology can solve issues like this but it's not a solution. It can be an aid, it can contribute to the bringing together of agencies, but it will not solve these embedded factors. To foster true coordination and to create a true Coordinated Management and Emergency Response Assemblage (CMaERA), there needs to be an overhaul of how each agency is structured and reliant on their independence. This is a momentous task that will occur over time as small changes are enacted but technology is not the solution.

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## Appendices

### Appendix 1: Sample Interview Questions

#### *Questions for Emergency Services*

1. Would you define your relationships with other agencies as formal?
2. How effective is inter-agency coordination between the different principal responders and also with other agencies? Has this changed in relation to increasing flood risk?
3. How has the historical organisation of An Garda Síochána changed and how does it affect today's organisation?
4. How do the different institutions of a CMaERS communicate during an emergency?
5. Is the current system robust (fit for purpose)?
6. How did austerity budgets affect your ability to serve and protect communities, particularly during major emergencies such as flooding?
7. How does your control room work? How are calls graded and dispatched? Is there an inter-agency aspect to your control room?
8. Have you heard of the Smart City dialogue being put forward by Dublin City Council? What role do you have in this? How do you see technological changes in the fabric of the city changing how you respond to events such as flooding?
9. What innovative practices or technologies have you, are you or hoping to implement to help during major events?
10. How do you collect, analyse and disseminate data related to emergency management?
11. Discuss the historical organisation of the National Ambulance Service?
12. How do you work with Dublin Fire Brigades Ambulance Service? You recently moved out of their station, how has this affected your relationship?
13. How do the different institutions of a CMaERS communicate during an emergency?

14. How have you seen the system change overtime, as flooding becomes more of an issue, and activation of the system is more frequent?
15. What do you see as the cracks or fault lines in the current organisation of the system?
16. Do you have a say in policy or a chance to provide feedback?
17. How do you collect, analyse and disseminate data related to emergency management?
18. What is the general procedure for the fire department in the case of a flood or any other major incident?
19. The fire department is part of the local authority how does this work regarding governance of the city and/or emergencies in the city? Do you believe the fire department should be a principal response agency?
20. You have a close relationship with civil defence? Can you expand on that?
21. Do you think Boston has a Coordinated Management and Emergency Response system (CMaERS)?
  - a. If so, how does a CRO benefit or contribute to it and where do you sit?
  - b. What other organisations and institutions are in it?
  - c. What is its aim?
  - d. How is it funded? Is the CMaERS funded in total, or are the individual members funded?
  - e. How is it governed and designed?
  - f. How does it actually operate and work?
  - g. Does it drive public policy or does public policy drive them?

*Other sample questions used for different agencies*

1. Do you have any staff, forecasters etc, sitting within other organisations such as local authorities, OEM, AGS, control centres - would you see this as an effective role?
2. TUCSON automated 18 stations allowing for real time quality weather observation data. How do you ensure the quality of this data and the resilience of the system? These feeds feed into your IT operations correct?

Does any other agency have access to this preliminary data? You share it with Dublinked, you have an app, do you see this as a positive move towards creating a more weather resilient city? Could the app contain more specific flood warnings or Dublinked?

3. How much lag time is there before you alert the authorities of a storm or emergency? Who do you alert?
4. Do you use probabilistic tools in your forecasting? Do these help to ensure the resiliency of multiple models solutions which often have a level of uncertainty?
5. I have a quote from Andy Revkin stating that policymakers must prioritise weather infrastructure at the same level as national security (because they are actually related". Would you agree?
6. Can you take me through the Task force on emergency planning, the Office of Emergency planning and the National Steering group on Major Emergency Management? Trying to work out the governing structures, who has ultimate power/responsibility, how they interconnect and work together.
7. How effective is inter-agency coordination across the scales from local to national?
8. What do you think of the concept of Coordinated Management and Emergency Response Systems? (An assemblage of coordinated agencies, including but going beyond, the Principal Response Agencies and first responders and using technology and data as a way to create this).
9. Discuss the Common Emergency Communication and Information System. What it is, how it came about, groups involved, what it does and Ireland's role?
10. So, after exploring how the system is organised, where would you locate power in the Emergency Management System at different scales?
11. There are a number of control centres in Dublin usually manned by individual agencies, in the case of a national event are all these data streams accessible from the National Emergency Coordination Centre? During an event in Dublin City, is the NECC used by DCC as a local coordination centre? Who is in charge? Does leadership change depending on the crisis or level of emergency?

12. Is there an agency in this system, solely responsible for the collection and sharing of data between the different members?
  - a. How do they do this on an everyday basis?
  - b. How do they do this before, during and after a flood event?
13. Is there good communication and interaction between different departments across Boston and across jurisdictional boundaries in terms of planning and responding to climate change and climate induced crises?
14. What do you see as the biggest climate risk for Boston? Is flooding a high-risk event for Boston?



## Appendix 2: Ethics letter of approval

**MAYNOOTH UNIVERSITY RESEARCH ETHICS COMMITTEE**  
MAYNOOTH UNIVERSITY,  
MAYNOOTH, CO. KILDARE, IRELAND



Dr Carol Barrett  
Secretary to Maynooth University Research Ethics Committee

15 June 2017

Aoife Delaney  
NIRSA  
Maynooth University

RE: Application for Ethical Approval for a project entitled:  
**Urban Resilience: Flooding and the role of Coordinated Management and  
Emergency Response System [Ref No: SRESC-2015-067]**

Dear Aoife,

The extension to the above project has been evaluated under Tier 2 process,  
Expedited review and we would like to inform you that ethical approval has been  
granted.

Any deviations from the project details submitted to the ethics committee will require  
further evaluation. This ethical approval will expire on 30 April 2018.

Kind Regards,

A handwritten signature in black ink, appearing to read "Carol Barrett".

Dr Carol Barrett  
Secretary,  
Maynooth University Research Ethics Committee

C.c. Professor Rob Kitchin, NIRSA

Reference Number SRESC-2017-062
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## Appendix 3: Informed Consent form



# The Programmable City



## Consent Form

Urban Resilience: Flooding and the role of Coordinated Management and Emergency response Systems.

Aoife Delaney, NIRSA, Maynooth University

Material gathered during this research will be treated as confidential and securely stored on encrypted devices and treated following the security and anonymity protocols of the Irish Qualitative Data Archive. You have the right to access any of your interview materials (tapes, transcripts and notes) at any time.

Please answer each statement below concerning the collection of the research data.

1.	I have read and understood Consent to Participate in Research Form.	Yes No
2.	I have been given the opportunity to ask questions about the study.	Yes No
3.	I have had my questions answered satisfactorily.	Yes No
4.	I understand that I can withdraw from the study at any time without having to give an explanation.	Yes No
5.	I agree to the interview being audiotaped and to its contents being used for research purposes.	Yes No

Below, are sets of statements that give you, the interviewee, a series of options about how you wish your interview to be used. Please answer each statement.

6.	I agree that excerpts from the interview can be used in papers, reports and books published for academic and educational purposes	Yes No
7.	I agree to being identified in this interview and in any subsequent publications or use	Yes No

IF YOU ANSWERED “YES” TO Q.7, GO TO Q.9; IF “NO” PLEASE ALSO ANSWER Q.8

8.	Where used my name must be removed and my comments made unattributable.	Yes No
9.	I agree to the interview notes/transcripts (in line with the conditions outlined above) being archived and used by other bona fide researchers.	Yes No
10.	I agree to my audio files (in line with the conditions outlined above) being archived and used by other bona fide researchers, excluding IPR, corporate strategies and other commercially sensitive information.	Yes No

Name (printed)

\_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

Your contribution is greatly appreciated. Feel free to contact us if you have any further questions.

Aoife Delaney Phone: 086 - 7362257 Email: Aoife.delaney.2011@mumail.ie

*If during your participation in this study you feel the information and guidelines that you were given have been neglected or disregarded in any way, or if you are unhappy about the process, please contact the Secretary of the Maynooth University Ethics Committee at [research.ethics@nuim.ie](mailto:research.ethics@nuim.ie) or +353 (0)1 708 6019. Please be assured that your concerns will be dealt with in a sensitive manner.*



# The Programmable City



## INFORMATION SHEET

### Emergency Management Assemblages and the Smart City

Aoife Delaney

National Institute for Spatial and Regional Analysis (NIRSA), MUSSI,  
Maynooth University

Date: 10/19/2017

Dear ,

You are asked to participate in an interview on the theme of understanding smart cities which is being conducted as part of a large European Research Council funded project entitled the Programmable City.

You were selected as a key informant in this research project because you are considered a key stakeholder and expert on emergency response, coordination and use of technology. If you volunteer to participate in this research, you will be asked a short series of questions about Boston, Massachusetts and the USA in general.

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<sup>24</sup> Anything highlighted was changed per participant to ensure the information was relevant to their position and expertise.

These interviews may be recorded, transcribed or notes may be taken by hand or on a computer. In total, the interviews should take approximately one hour. Further, follow-up calls or meetings may be required to clarify information or to acquire recommended documents. These communications will be brief. You will be allowed to view the notes and quotes of the interview and any other documents produced as a result of this interview. You may also decide to have the information you provide attributed or not in publications.

The nature of the questions is not personal or confidential and should pose no risks or discomfort to you. You will not be remunerated by the researcher for your participation as you are participating as a volunteer.

Your participation in the interview will assist individuals and organizations interested in this topic to develop a better understanding of **smart cities and emergency management** and their development and the results will be part of a case study to inform academic publications.

You will be asked if any material should or should not be directly attributed to you. Any information that is obtained in connection with this study is not considered personal or confidential. However, if information gathered during these interviews is to be disseminated beyond the researcher, your name will not be disclosed while the role and the name of your institution may be identified, unless otherwise specified. The researcher will keep this consent form confidential and any other documents related to this research will simply refer to you by your role and institution.

In the event that your name requires disclosure this will only be done with your permission or as required by law. With regard to the latter, it must be recognized that, in some circumstances, confidentiality of research data and records may be overridden by courts in the event of litigation or in the course of investigation by lawful authority. In such circumstances Maynooth University will take all reasonable steps within law to ensure that confidentiality is maintained to the greatest possible extent.

Any data gathered during the course of these interviews will be stored on encrypted CD, data keys, laptops and folders on a server. File names will include dates and an assigned number for you only. These will be shared with the other researchers on

the project. Once the research project is complete the recordings will be deposited in the Irish Qualitative Data Archive (IQDA) and made accessible to future researchers. Data made available to the IQDA will only be allowed with consent of the interviewees.

If you do not wish for your content to be deposited within the IQDA, the data will be retained securely by the researcher for a minimum of 10 years as stipulated in the MU Research Integrity Policy. It will remain stored as outlined above, and after 10 years all the transcripts, electronic notes and meta data will be destroyed using appropriate tools to delete and overwrite the content. Any hard copies of transcripts or notes will be destroyed immediately after completion of the Viva and termination of the project, using confidential shredding as approved by the University.

Should the discussion move on to propriety IPR, corporate strategies and other commercially sensitive information, that information will not be disclosed nor deposited in the IQDA.

If you volunteer to be in this study, you may withdraw up until **April 2018** without consequences of any kind. Should you decide to withdraw you may decide at that time if I may use the information you have provided or you may request that it be destroyed. You may also refuse to answer any questions you don't want to answer and still remain in the study. The researcher may withdraw you from this research if circumstances arise which warrant doing so.

This research was reviewed and received ethics clearance by the Maynooth University Social Research Ethics Sub-Committee. If you have any questions or concerns about the research, please feel free to contact:

Secretary of the National University of Ireland Maynooth

Ethics Committee

research.ethics@nuim.ie

or +353 (0)1 708 6019

Name and signature of researcher

\_\_\_\_\_

**Date** \_\_\_\_\_

## CONSENT

**I understand the procedures described above. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.**

---

**Name and signature of Key Informant**

**Date** \_\_\_\_\_

### Appendix 5: Interview Code sheet

1. Interagency- red
2. Coordination - blue
3. Technology- yellow
4. urban governance - green
5. Conflict/tension - purple
6. Data - brown
7. neoliberal politics - orange
8. case study - pink
9. geographies of scale – navy
10. networks and power - crimson
11. citizens – peach



## Appendix 6: Garda application<sup>25</sup>

### An Garda Síochána Protocol for External Research

This document is intended to formalise the relationship between An Garda Síochána and any researcher (Garda member, student, academic institution, practitioner or agency) carrying out research into or on behalf of An Garda Síochána.

On completion of the research, we ask the researcher to submit to An Garda Síochána a summary report of the research findings for internal publication.

This document is to be completed for external research either funded or not by An Garda Síochána. This includes any individual, academic institution or agency requesting the assistance of An Garda Síochána data, personnel or resources.

	Contact Details
Name	Aoife Delaney
Org / Uni / Dept	National Institute of Regional and Spatial Analysis and Geography Department of Maynooth University.
Address	21 Ard Evan Grove, Monasterevin, Co. Kildare
E-mail	AOIFE.DELANEY.2011@mumail.ie
Phone	0867362257

#### Part 1: Research Agenda

<b>1)</b> <b>Research Aim and Design</b>	<b>Please give details of the research aim, methodology and design.</b>  <b>a) What is the aim of the research?</b> The thesis will focus upon the modus operandi of the Coordinated Management and Emergency Response System (CMaERS) of Dublin, Ireland and Boston, Massachusetts. CMaERS are an organisational system in which all the relevant agencies of a city (Emergency Services, Local Authorities, Insurance Firms, communities, charities, the Defence Forces, engineers, Civil
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<sup>25</sup> I was required to send this application in for every interview with a member of AGS. However, I was only required to make small edits and highlight them. I have included my last edition.

	<p>Defence, the Government, etc) come together in a local coordination centre and compile their expertise and data in order to respond to a crisis (such as flooding) in a timely and efficient manner.</p> <p>The aim of the research is to map out the CMaERS in both Dublin and Boston in terms of how the system is organised and run in practice with respect to flooding response. Secondly, it will examine the fault lines or potential breakages in the system.</p> <p>These will be explored through a comprehensive study that brings past events, the present and potential future changes into discussion with each other. Firstly, to map out the CMaERS of Ireland, this research will explore the historical and legacy governance structures of individual agencies that often act as barriers to change and inter-agency coordination. Simply, it's a genealogy of how each emergency response agency or Principal Response Agency (PRA) were organised and what is presently sustaining them (Past to Present).</p> <p>Secondly, the research will explore how resilient the CMaERS system is and its individual agencies are, under pressure from a crisis such as a major flood event. Where does the system crack or what fault lines arise because of institutional tensions, lack of technology and other resources, policy exclusion etc. (Present).</p> <p>Finally, how will CMaER agencies work with the new Smart City dialogue being put forward by Smart Dublin? What potential does the CMaERS have with new technology and sensor systems being funded through the smart city? Is the Smart City likely to transform how the CMaERS operates and are governed? (Present to future).</p> <p>There are three key objectives to this research:</p> <ol style="list-style-type: none"> <li>1. Illuminate the organisational structure of a CMaERS. (Who is involved? Its hierarchical structure. Who is in charge? Who has ultimate responsibility? Who gets what funding and resources?)</li> <li>2. Explore a CMaERS interaction with smart city solutions/goals and ascertain whether this relationship is effective in creating resilience in both cities. (How do they work in practice? Are they effective? What shapes their deployment?)</li> <li>3. Situate the role of a CMaERS towards flooding within wider societal and institutional structures that develop and implement public policy. (Where do they fit in society? Do they only appear when a crisis occurs? Who governs them?)</li> </ol>
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	<p>How do they affect society? Do they change institutional structures?)</p> <p>The research question is:</p> <p>How are the Coordinated Management and Emergency Response Systems of Dublin and Boston organised and what cracks appear within the system and its individual organisations with regards to the emergency response of flooding?</p> <p>The sub questions of this research are:</p> <p>What are the aims and objectives of a CMaERS?</p> <p>Who is protected through a CMaERS?</p> <p>How are CMaERS governed and designed?</p> <p>How do CMaERS actually work and operate?</p> <p>How do CMaERS drive public policy and how does public policy drive CMaERS?</p> <p>How do the different agencies of a CMaERS share information and communicate?</p> <p>How do CMaERS interact and respond to smart city solutions?</p> <p><b>b) What methodology do you intend to use?</b></p> <p>This research is divided across two cities: Dublin and Boston. Dublin is the primary location with Boston being the secondary location. The data gathered from Boston will be used to support, compare and contrast the findings of Dublin. The goal in both cities is to establish what type of CMaERS they have in place, the technology in place to deal with flood challenges, how public policy is developed and implemented in the city, the key agencies of the CMaERS and their organisation and governance.</p> <p>The key methodological strategy for this research involves two main methods: semi-structured interviews and Discourse Analysis (DA).</p> <ol style="list-style-type: none"> <li>1. A discourse analysis (DA) will be used to illuminate the narrative surrounding the often contested notions of risk, resilience and the smart city from a variety of positions including the academic, institutional, city and corporate perspectives. Further, these varying perspectives may be impacted due to different cultures, societal values and</li> </ol>
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governance between Dublin and Boston. A DA will help to identify these narratives and develop an understanding of how each city responds to a flood, how their CMaERS are organised and governed.

2. Semi-structured interviews will be conducted simultaneously to the DA. A variety of participants and stakeholders will be interviewed in the chosen cities, one of which is An Garda Síochána. The interviews will be compared to the results of the DA to identify any similarities and differences between the publically available information and the interviews. However, there is potential for the DA to influence the line of questioning.

The interviews will be semi-structured, thus, there will be 5-10 set questions, in order to allow for more of a conversational interview to emerge. Each interview will last between 45 and 60 minutes and where possible will be conducted face to face or alternatively, over Skype or the phone. Any follow up interviews will be kept to a maximum of 30 minutes.

The issues to be explored in the interviews differ between participants: representatives of the CMaERS (including An Garda Síochána) will be asked about their role in the group, the overall aims and objectives of the CMaERS, **how data is shared between agencies**, funding for CMaERS, how CMaERS are activated, the procedure for responding to a flooding incident, whether they are aware of any smart city solutions to flooding and how they are affecting/influencing the effectiveness of CMaERS. **Further, Garda participants will be asked about ROCSAFE, ETHANE, technological aspects of emergency response and the 999/112 system and multi-agency response to crises such as flood events.**

The interviews will be coded using MAXQDA and used to illuminate the data by placing a narrative around the affects of flooding and the notion of resilience. It will also be used to illustrate the role of CMaERS, their evolution, governance and design and how they have changed each city's approach to flooding.

All data will be anonymised. Each transcript will be coded with the spreadsheet of participant names and codes kept on a separate encrypted hard drive from the transcripts. Thus, only the researcher will know which interview belongs to which participants. All transcribing and analysis for An Garda Síochána will be done solely by the researcher.

In the case that confidentiality cannot be ensured i.e due to the weight of a job title or easily made connections due to the

information revealed, this will be clearly discussed with the participant and all measures will be taken to ensure the participant is comfortable and happy to continue.

All participants will be required to read and sign an informed consent form along with an information sheet that will be sent to them as soon as they agree to the interview. During the confirmation email, the consent form and information sheet will be sent again. On the day of the interview, the researcher will also bring along the form and will go through it with the participant ensuring they are aware of the study and the potential outcomes. This will be especially important in cases where confidentiality cannot be ensured.

All participants will be asked for permission to record the interview and all will have continuous access to their transcripts and can pull out of the process right up until the end of the fieldwork i.e **May 2018**. Further, An Garda Síochána will be given the opportunity to view any subsequent publications stemming from this data and overall thesis to provide feedback and clarification but not veto the argument, thus, all quotes will be published anonymously.

The data will be retained securely by the researcher for a minimum of 10 years as stipulated in the MU Research Integrity Policy. The data pertaining to such interviews, including electronic notes and meta data will be stored on an encrypted hard drive for that period. The key containing the codes matching the data to the relevant participant will also be stored on a different encrypted hard drive located elsewhere. Any hard copies of the transcripts will be destroyed immediately after completion of the Viva and termination of the project, using confidential shredding as approved by the University. After the ten years, all the transcripts, electronic notes and meta data will be destroyed using appropriate tools to delete and overwrite the content. This will be overseen by the project PI and executed by the technical support team within NIRSA.

**c) What sample of participants is required & how will they be recruited? (Please state no. of interviews, interviewee type and detailed method of accessing them)**

It is anticipated that about 4-10 interviews will be conducted with An Garda Síochána ranging from the strategic to operational level and control room staff.

Participants from Garda headquarters will be formally approached by the researcher if permission for the research is granted.

Alternatively, Gardaí from various stations around Dublin City, will be approached on the recommendation of the Garda Research Review Board. It has proven effective to begin the interview process with a Chief Officer or someone high in the ranks, of the equivalent emergency service, with knowledge or experience of working in Local Coordination Centres and amongst other agencies such as, Dublin Fire Brigade, HSE, The Red Cross during flooding or other emergency events. Through this, they can usually identify, who in the middle and lower ranks would be most suitable to talk with. It is interesting to interview different ranking members due to their different experiences of the real world operation of the Framework for Major Emergency Management.

Further, due to the nature of the research, interviewing someone from the Dublin Control room regarding dispatch and the overall 999/112 system during a major emergency is necessary. It is also important to speak with someone with knowledge of how you collect, analyse, disseminate and use data regarding major emergencies only.

Participation is on a one-time contract. However, as the research evolves, subject to any potential development or extenuating circumstance, participants (principally only higher ranking members will be contacted again for clarification or comment, either by e-mail or through a brief follow-up interview. And, as mentioned elsewhere, meeting with the Garda Archivist would be advantageous in order to explore the development and growth of the agency and how it affects its current position in emergency management.

Finally, I had the privilege to listen to three very interesting presentations by An Garda Síochána at the recent Major Emergency Management (MEM) Conference. These were in relation to ROCSAFE, ETHANE and multi-agency response. They are all in line with the research aims and thus, interviews conducted around these topics would be excellent additions to the research project.

Update: It was suggested during one of my interviews with one of the participants that I should meet with Garda Sara Parsons from the Garda Analysis Unit. I would be interested in meeting with her in order to evaluate how data is collected, aggregated and analysed. This is particularly important as my research has progressed towards studying the shift in urban governance towards forms of anticipatory and algorithmic. Thus, the importance of understanding how An Garda Síochána collect and use data will help me figure out the (dis)connection between the operation of emergency services and

	<p>city management this may touch on the idea of predictive policing which is being used widely in the US. Further, Boston Police Department provided me with very interesting information regarding their use and collection of data and it would be an interesting comparison of the two agencies where potential lessons could be learned for both agencies. Finally, if you grant me this final interview my supervisor Prof. Rob Kitchin will be attending in a supervisory capacity for me.</p>
<p>2) AGS Contributions required for research?</p>	<p><b>Please give details of the any An Garda Síochána contributions required of the research.</b></p> <p><b>a) An Garda Síochána Sponsor / Contact</b></p> <ul style="list-style-type: none"> <li>• In relation to ROCSAFE and ETHANE, Superintendent Finbarr O'Sullivan and in relation to multi-agency response, Superintendent Andrew Hawkshaw. Both presented at the MEM conference.</li> <li>• Garda Archivist</li> <li>• Control room personnel</li> <li>• Information and communication and emergency management teams.</li> <li>• Garda Data Analysis Unit-suggested person was Garda Sara Parsons</li> </ul> <p><b>b) Access to An Garda Síochána Data (Please specify whether aggregated or personal data is required)</b></p> <p>(This highlighted section is not re-written it was in original application but I feel it should be highlighted here). As explained in section 1.C, this research requires an interview with a person who has knowledge regarding how data is collected, analysed and disseminated with particular attention to data around emergency management. Any data that reflects private property or is of a personal nature is not necessarily required but if available aggregated would suffice. This data could range from 999/112 calls during a major flood event and the specific reasons beyond general flooding i.e elderly person, traffic management, burglary or assault and also by general geographic region i.e Dublin Docklands rather than a specific address. All this data would be used to try and understand the different types of calls that all the emergency services get during a flood emergency and how they coordinate these responses.</p>

Other interesting data would be the different jobs or roles that officers had during the flood event and the number of Gardaí on site in affected areas and elsewhere in the city during the event. This could also include protracted hours of Gardaí due to the event.

Further, to aid the DA part of the methodology, any policy documents (related to emergency management) not readily available online, that could be provided to me, would be an excellent source of data for this research.

**c) Access to An Garda Síochána staff (Rank, roles, unit, responsibility, quantity)**

For a comprehensive study, representatives of the following offices or ranks would be ideal.

- A representative of the Office of the Deputy Commissioner of Strategy and Change Management –to discuss changes to training in light of previous flood events;
- A representative of the Office of the Deputy Commissioner of Operations- to discuss how the service operates during an emergency in relation to traffic, support services, crime, data collection and dissemination and coordination with other agencies;
- The Executive Director of Information and Communication or a representative – to discuss communication, data collection and technology in use by operational and higher ranked Garda;
- Deputy or Assistant Commissioner or Chief Superintendent
- Sergeant;
- Gardaí and a Community Garda;
- Garda trainers with knowledge of emergency management and/or flooding; and
- Garda Archivist in the Garda Museum.
- Superintendent Finbarr O'Sullivan -ROCSAFE, ETHANE and any other information that could be provided on the technological aspects of emergency management and the 999/112 system.
- Superintendent Andrew Hawkshaw - multi-agency response to crisis.
- Garda Sara Parsons- Garda Analysis Unit

**d) Access to An Garda Síochána IT systems (Specific equipment, software or specialist techniques)**



	<p>Access to the Control Room in Dublin City to observe how calls are taken and dispatched. This is in order to compare and contrast with other emergency services and explore both strengths and weaknesses of these systems.</p> <p><b>e) Access to An Garda Síochána sites</b> The Control Room and relevant stations or Headquarters where interviews can take place.</p> <p><b>Is your research funded by the An Garda Síochána</b></p> <p>No</p> <p><b>f) If it is not An Garda Síochána funded, please specify who is the funding body</b> This research is funded by the European Research Council, through the Programmable City project at Maynooth University (grant: ERC-2012-AdG 323636-SOFTCITY). The Principal Investigator is Prof. Rob Kitchin of Maynooth University.</p> <p><b>g) Any other contributions</b></p>
<p><b>3)</b> <b>Timescales and Deliverables</b></p>	<p><b>Please give details of any timescales or milestones required of the research.</b> (Please include details of your access to An Garda Síochána resources; security clearance; data collection and analysis; final reporting, publication etc)</p> <p>Access to An Garda Síochána members, the Control Room and any relevant data would occur between <b>December 2016 and May 2018</b> (originally was late August and <b>June 2017</b>) depending on participants availability. The interviews will be transcribed between <b>immediately</b>. They will be sent to each participant to be proof read and edited at will. Analysis will begin after <b>immediately</b>. Submission of the PhD will be October 31<sup>st</sup> 2018. Conference presentations, journal articles and blog posts will be published from 2018 onwards using data from these interviews and others. As stated in section 1, all quotes will be anonymous and An Garda Síochána will be given the opportunity to view the articles and provide feedback and clarification but not to veto the argument.</p>

<p style="text-align: center;"><b>4)</b> <b>Corporate &amp; Strategic Context</b></p>	<p><b>Please give details of the corporate context of the research and its scope with respect to internal or external stakeholders.</b></p> <p><b>a) How does the proposal meet An Garda Síochána strategic priorities?</b></p> <p>The mission of An Garda Síochána is to work with communities in order to protect and serve them. This protection is extended to victims of emergency situations, which include crises that occur due to natural hazards such as flood events. Therefore, this research will work towards illuminating the role of the Gardaí during an event and highlighting the past work that Gardaí have done trying to protect and serve their communities. Further, it will offer potential insights into how An Garda Síochána can continue offering a high level of protection during flood events (and other incidents as an All-Hazards approach will be considered) taking into account changing economic, technological and societal environments.</p> <p>The Strategic priorities of An Garda Síochána from 2013-2015 (the most up to date information that could be located at present) outline 4 key goals for the service, each of which relate to this research in different ways.</p> <p>The former Commissioner Martin Callinan spoke about organisational change that would occur between 2013 and 2015. Organisational change is never an easy or straightforward action but with the changing nature of society, technology and the economy, it is essential in order to provide an effective service. Part of this research will explore how separate emergency service agencies have changed over time due to changing environments. This will be used to illuminate how power and responsibility is organised and understood within the agency themselves and between agencies, thus, exploring how different agencies coordinate, in harmonious and contested ways during a major incident. This will offer insights for An Garda Síochána regarding emergency management and potential technological change that contribute to organisational change and inter-agency coordination.</p> <p><i>*The following information was accessed online and is cited as (An Garda Síochána, 2013). The Reference can be found below this section.</i></p> <p>“Goal 1: Securing Our Nation” – This goal makes one think of manmade or terrorist related incidents, which are critical to the</p>
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protection of the public and serving members but it also extends to natural hazards such as, flooding. Marshall Shepard (2015) stated that policymakers must prioritise weather infrastructure at the same level as national security (because they are actually related). This argument presents natural hazards as a risk of the same level as terrorism or other security risks. It highlights the fact that national security is about protecting state interests and the people of the state. A natural hazard is under-reported (unless it actually occurs) and often portrayed as far-fetched but they can have as much of an effect on national security as cybercrime, hacking or terrorist attacks. Thus, this research can provide insights into how An Garda Síochána can extend their strategic priorities to clearly include both manmade and natural hazards. The strategy discusses “enhanced level of readiness for major emergencies”, this research will meet this criteria by exploring how the police service works with other emergency agencies, NGOs and other stakeholders. How as an overall system can the Gardaí ensure their readiness for major emergencies that include flooding (one of the highest risks Ireland faces) but also other risks, that are not necessarily within the Gardaí’s area of expertise such as, epidemics but simultaneously, be prepared for crises that the Gardaí ultimately are held responsible for such as terrorism, hacking, aggravated protests etc.

“Goal 2: Proactive Policing Operations” – This particular goal is not directly or obviously linked to this research but the strategy discusses how the Gardaí “will work with partners to try and prevent and reduce the threat of crime”. During an emergency of any kind but particularly flooding, houses and shops are more vulnerable to theft as people leave them unattended, while seeking shelter or medical attention. Further, stressed, anxious and scared people may become violent towards emergency service personnel, volunteers, medical staff, county councils or others. This research will highlight the important role the Gardaí play in creating a safe space in an unsafe environment for all involved. This needs to be portrayed and made clear amongst coordination efforts with other agencies and in future policy directives related to emergency management of natural hazards where there is no particular person or organisation responsible for the event. In cases of natural hazards, the Garda response should be one of creating safe spaces and reducing potential

crime rather than one of catching the people responsible for the overall event as with a terrorist attack.

Further, due to sensitive information the Gardaí need to be proactive in sharing information and data with agencies running shelters and the HSE regarding known criminals who may be a risk to members of the population. They, regardless of their past convictions, are entitled to being safe during an emergency, but this needs to be coordinated in a way that doesn't result in mass fear or the chance for the person to re-offend during a situation where it is easy to lose track of one person. From what I can understand, this is already in action but this research has potential to highlight how technology and innovative practices can create a more collaborative and coordinated approach to a situation of this nature.

“Goal 3: Ensuring Safe Communities”- This is critical to emergency management especially, in communities prone to flooding. Having spoken, informally, to members of the public, over the last number of years during austerity, the presence of Gardaí has reduced and most see the Gardaí as a negative authority figure. This goal, from what I can understand, attempts to bring Gardaí back into the community and to encourage relationships to form between serving Guards and the community. This is a key tool to develop views of the Gardaí as a positive authority figure, one which seeks to “protect and serve” not catch a person out. This goal also allows for Community Guards to recognise who may be vulnerable in certain situations. This research is a proponent of coordinated action between emergency agencies but recognises that sharing of information regarding individuals in a community can be slow to access and important information, sometimes critical information, is lost due to the Data Protection Act i.e the reason for a person's vulnerability is not shared, which can restrict a person's ability to help them. An example would be someone who suffers from severe anxiety, the HSE may be aware of their situation but the Gardaí who might have to help this person may not be aware of the situation. However, community policing has the potential for those guards to work with public health nurses and the HSE, homes for the elderly and schools get to know who is vulnerable in that community and build trust, so if an incident occurs, help with knowledge can be delivered efficiently. This research will attempt to explore that aspect of coordination

between agencies to help an individual as it simultaneously helps the masses.

“Goal 4: Delivering a Professional Service”- This goal is about understanding the resources the Gardaí have and how this has potential to change. It also discusses how the Gardaí can be made a more efficient and accountable service. As this research is looking at technological conditions of emergency services as a way of exploring how coordination between agencies can be secured even as the organisation of agencies change, the research has the potential to provide insights into what technological changes are needed, where the systems strengths and weaknesses are and how these can contribute to better coordination between agencies while also keeping in mind budget restrictions.

\*An Garda Síochána (2013) *Strategy Statement 2013-2015* [Online], Available at:

<http://www.garda.ie/Documents/User/Garda%20Strategy%20Statement%202013%20>

English.pdf. (Accessed 9th June 2016).

\*Shepherd, M. (2015) *Some Perspective on European vs American Weather Models after Hurricane Joaquin*. [Online]. Available at:

<http://www.forbes.com/sites/marshallshepherd/2015/10/03/european-model-vs-american-model-post-joaquin-debate-likely-but-some-perspective/#322bfeed152c> (Accessed 21 July 2016).

**b) What are the expected benefits of the research?**

The expected benefits of this research are:

1. Explore the Framework for Managing Major Emergencies from the perspective of the Emergency services and other related agencies.
2. Provide a voice to all ranks of the service regarding emergency response in Ireland.
3. Provide information regarding possible technological and innovative changes from analysing other countries uses of technology.
4. Provide a comparison between Boston Police Department and An Garda Síochána approaches to emergency management, community policing, uses of technology, inter-agency coordination and innovative aspects of the police forces.

	<p>5. Illuminate how the Gardaí can create more networks between other agencies; relationships that occur at all ranks.</p> <p>6. Offer recommendations for future frameworks and individual emergency response agencies.</p> <p>7. Offer a more coherent understanding of how smart technology and data analytics are shaping emergency services.</p> <p><b>c) Who are the likely audiences for the products of the research?</b></p> <p>The likely audience are twofold. Firstly, academic audiences will be engaged with through publication in books, journal articles and through conference presentations. Thus, this research has the ability to transcend the borders of Ireland and be read and explored by academics across the world especially, as it is a comparative study between Dublin and Boston. Secondly, members of all the agencies who participated within in this research. Each will receive a synopsis of the research with key recommendations from the research sometime in late 2018 or early 2019. These agencies include emergency service, local authorities, insurance firms and other NGOs.</p> <p>This research also has potential to move into the public domain through blog posts. I have my own blog, which I hope to write excerpts of my research on but there are a number of other blogs I also hope to write for mainly, the Maynooth University Geography Department and The Programmable City blogs. All three of these mainly reach an academic audience but have potential to be shared across social media platforms.</p> <p><b>d) Any internal / external stakeholders, units, agencies or institutions involved?</b></p> <p>All the participants of my research are stakeholders as the research illuminates their work practices, organisations and technological uses but for ethical reasons they cannot be named in this document. Other external institutions are Maynooth University where the research is conducted and the European Research Council who fund the research.</p>
<p>5) Next Steps</p>	<p><b>Would you be happy to present your findings to an An Garda Síochána-wide audience in an academic seminar?</b></p> <p><input checked="" type="checkbox"/> Yes      <input type="checkbox"/> No</p>

**Completed by:**        **Aoife Delaney**  
**2016**

**Date: 21 July**

**Part 2: Meeting the AGS requirements**

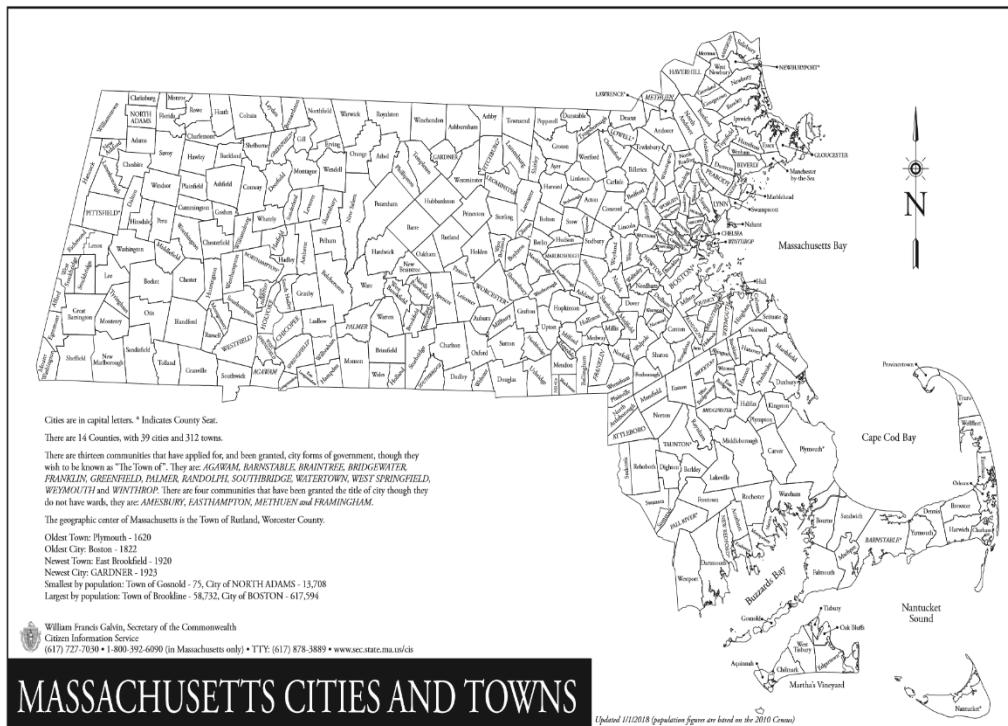
(To be read and agreed by the Researcher)

- To assure anonymity and confidentiality, when handling data or other information provided by An Garda Síochána I / we will ensure the requirements of the Data Protection Act are maintained.
- ~~I/~~ we will acknowledge An Garda Síochána as a source of information in any final report.
- ~~I/~~ we will acknowledge those that carried out any original analysis / research or collection of data and declare they have no responsibility for further analysis or interpretation of it.
- ~~I/~~ we will submit a summary report detailing the aims, methods, findings and implications for policing to An Garda Síochána.
- ~~I/~~ we understand that I / we may be invited to present the research findings before an internal An Garda Síochána audience in an academic seminar.
- ~~I/~~ we will give access to the data / information only to persons directly associated with the project. The data will not be used in connection with any other analysis except that outlined in this document.
- ~~I/~~ we will maintain a list of all persons who handle the data / information provided.
- ~~I/~~ we will consult with the An Garda Síochána regarding any media interest in this project.
- ~~I/~~ we will establish whether security clearance is required to undertake the proposed research, and complete any necessary applications relating to this.

Name (Block capitals)	Signature	Date
1:AOIFE DELANEY	Aoife Delaney	21 July 2016

2:ROB KITCHIN	<i>R. M. Kitchin</i>	22 July 2016
3:		
4:		
5:		
6:		

Appendix 7: A map of Massachusetts towns and cities



Appendix 8: List of MAESF's

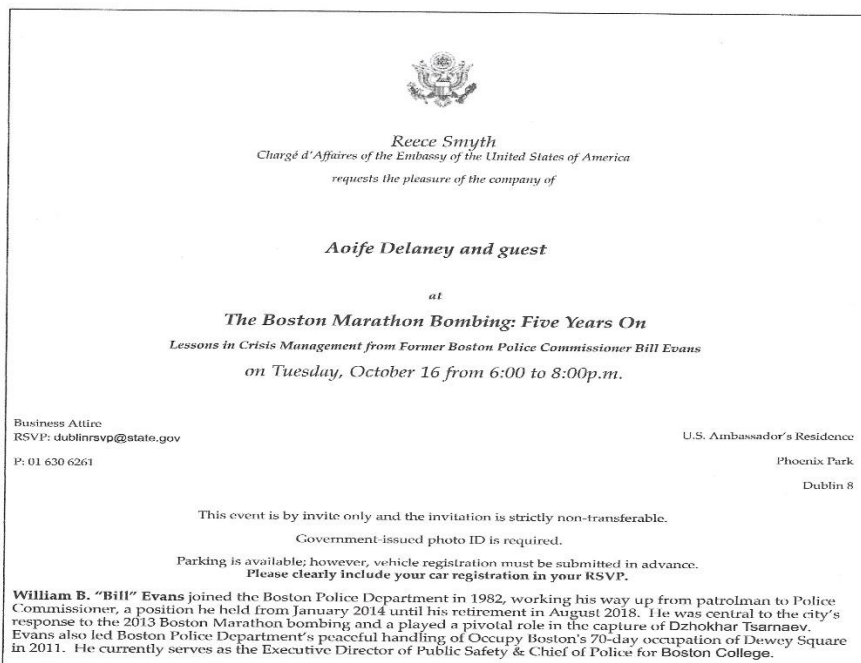
Massachusetts Emergency Support Function (MAESF) Annexes:

- MAESF 1: Transportation
- MAESF 2: Communications
- MAESF 3: Public Works and Engineering
- MAESF 4: Firefighting
- MAESF 5: Business and Industry
- MAESF 6: Mass Care, Emergency Assistance, Housing, and Human Services



- MAESF 7: Volunteers and Donations
- MAESF 8: Public Health and Medical Services
- MAESF 9: Search and Rescue
- MAESF 10: Hazardous Materials and Environmental Protection
- MAESF 11: Agriculture, Animals, and Natural Resources
- MAESF 12: Energy
- MAESF 13: Public Safety and Security
- MAESF 14: Recovery
- MAESF 15: Public Information and External Affairs
- MAESF 16: Military Support

## Appendix 9: Invitation and notes from former BPD Commissioner Bill Evans Lecture.



Commissioner - 2014 - 2018

• advocate of community policing

- BPD ice cream van

- flashlight walks w. kids

• humanising the police not  
the warriors but the guardians

• how well did it work as a

strategy - bad press of police -

unarmed blacks - relationships

built with community beforehand

is essential → after someone

a terrorist died bring the

diff comms together. Don't

meet people for the 1st time

during a crisis, build relationships

before. - Agreements in place.

• how do you remain vigilant of a

crisis? Terrorism is a red, 5-

never thought it would happen

in Boston but on madhadda.

2 • lots of active shared  
constant training w/  
schools, hospital - know  
all your partners - don't  
wait till a crisis. Very  
active intelligence centre  
constant share of data  
blw agencies. Lots of  
prep before - U. good at  
separating crowds -  
diving them up so easy  
to move. Before any  
major event you need to  
have decisions made  
already - where will acc  
happen? where will the UCC  
be?  
After prep + it happens.  
Communication capability isn't  
easy so it needs prep

3  
ing matter  
o communit  
le agencies.  
Chief of  
divisions  
→ then  
→ he ra  
→ seeing  
something  
→ he s  
at l  
back  
→ (black  
→ he  
behind  
- Obama  
Search

lots of active shooting  
constant training w.  
pats, hospital - know  
our partners - don't  
all a crisis. Very  
intelligence center  
share of data  
naries. Lots of  
- U. good of  
crowds -  
up so easy  
before any  
you need to  
us made  
ere will all  
re will to UCC  
happens.  
capability in F  
dr. prep

### 3

during march - difficult  
to communicate across all  
the agencies.

Chief of uniformed police  
divisions

- > there were no threats
- > he ran the race.
- > seeing the bodies will be something I'll never forget.
- > he finished march at 1:34 was in hot tub back in uni on the street
- > 'black hat' + 'white hat' - suspects.
- > he placed bomb behind family - he knew.

- Obama's go care -  
Search - trying to find

4

terrorism - visits  
hospitals - keeping his  
side -

- shot officer in MIT  
\* Confirmed.

→ ~~to~~ released videos +  
photos after Obama  
left - they panicked.

- rumors from det

live ..

• bomb in JFK library same  
day as bomb

o people were crying,  
upset - rumors (8000)  
stopped in place - how do  
we get them back to the families

\* cop ya sh  
\* which - to

5

what was shot  
by his brother  
in charge from  
house - comm  
twitter - B  
even if in do  
he could s  
at d the b  
- sudden the  
all the cop  
John shot  
cops told

How do y  
under fire  
to take  
charge o  
- its better  
no one

visits  
- keeping his

cer in MIT  
rmed.

d videos +  
Obama  
micked.

ect

brary sore

ing,  
(6000)

- how do  
to the feminist

\* cop - you shot 1st about  
a witness - then solve.

5  
Walter - shot + no one  
by his brother.

In charge from Jan - have to  
have - communicating via  
twitter - BPD bring resources  
even if in foreign jurisdiction.  
- he could see him picking  
up the bomb - then all of  
a sudden the call went out +  
all the agencies were called.  
Then shots went out - then  
cops told to hold their fire.

How do you maintain com  
under fire? Someone has  
to take control - I was in  
charge over w. all the agencies  
- its better to lead then follow -  
no one is prepared for that  
kind of day, you just get  
to carry on.

◦ preparing + having all those relationships was imp. FBI were in charge but they advised Bill was the incident commander officer.

◦ People came out + cheering. People were locked in their house.

34 mn people watched it live.

◦ learned value of tourniquet - every office carries them now.

◦ learned how imp. comms are. Phones didn't work - twitter

◦ Self-deployment - everyone wanted to get at the guy - shots - less control for a while - need to learn that not everyone needs

6  
7  
goes to scene in stage - super in charge this case cheer - but its work him - 9/11 + disaster

Try to understand but how so

So much hate in another day drive us!

they did.

talk that it been inde

16 - they when care

rather than

near finish

terms we

comes i

ng + having all  
relationships was  
were in  
they advised  
an incident commad

+ cheering.  
red in their

watched it

urniquet -  
es tem nar.

comes acc -  
ark - twitte

- evayoe

to guy

the

7  
goes to scene instead of  
stage - super imp. to  
change this cause it causes  
cheer - but its nchrd, they  
want him - some happened  
in 9/11 + elsewhere.

- try to understand the why  
but how someone can be  
so much hate esp. on  
m other day - thats what  
drive us! No idea why  
they did.

- talk that it should have  
been Independence Day.

- 9/6 - they did it 4 hours in  
when card had made a  
rather than earlier - do  
near finish line where all the  
tabs were - 8 trans

comes in the oven



W/ 20 mins everyone  
was removed from the  
Scene + now at 10m  
died + this only happens  
H/c of our training protocols  
+ relationships, the 3  
that died were for serious

Anything done better?

Not involved in shutting down  
the city - into that those people  
were getting on train to NY,  
we didn't know the scope.

- I'm not worried about  
money - I'm worried  
about public safety.

- you can't put a price tag  
on a human life -

good move esp R blocker  
shut for 8 days.

9  
mist - way deal  
now - terrorism  
strong con  
policing is  
complex

enforced imm  
cause issue  
medic -  
quickly

Boston goin

evangelical  
on the  
from  
y happened  
y protesting  
the 3  
oo series  
?  
kingdom  
x people  
to NY  
scope  
but  
ed  
e tag  
blocker

## 9

hist - worry about crime  
now - terrorism, active states,  
strong communities -  
policing is much more  
complex esp. racial.

- enforced immigration laws -  
cause issues/sparks, social  
media - crowd can grow  
quickly

- Boston going to use body cam.

10

- Everybody participated - everyone should have gone to the staging area - need to teach.

\* Doesn't know who fired the 1st shot - like a domino effect - other agencies - he was telling them all to hold fire.

↳ not 1 agency  
- "swarm intelligence"

||  
- work together.

• community policing - working  
w. cps & kidset.

