Drone Policing

A realist case study of police technological innovation

Michael Coliandris

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Abstract

Recent years have witnessed a rapid expansion in the use of unmanned aerial systems (commonly referred to as drones) amongst constabularies across England and Wales. New and emerging potentials have been lauded amongst drone advocates, pointing to the many ways in which drones can augment and assist in a range of policing functions. These include, but are not limited to, crime scene investigations, public events monitoring, operational planning, search-and-rescue, and intelligence/evidence gathering. Critical social science has tended toward registering drone technology in terms of panoptic power; 'always on' surveillance which jeopardises privacy and civil liberties within domestic liberal democratic societies. An alternative register of drone policing is advanced in this thesis which challenges such unilateral accounts. Drone policing is instead understood as a socio-technical system which permits analysis of the ways in which drones shape and are shaped by policing. This realist conception compels empirical investigation into drone policing *in action* (as opposed to *in thought*). This case study exposes the human relations which enable and constrain drone policing, including localised regulation and parochialism, human error, technical malfunctions, and evangelism and resistance amongst police officers. These factors run alongside the conditions of the natural world – such as adverse weather and ferromagnetic interference – as well as the material world – as the UK grapples with widespread drone proliferation – which police drones are deployed into. Consequently, drone policing is reconceptualised in line with the context-mechanism-outcome pattern configurations symbolic of realist evaluations of policing programmes; the mechanisms which produce drone policing relate to diverse contexts. This thesis suggests that empirical study of drone policing *in action* can problematise hitherto teleological accounts of drone policing and generate the conceptual armature for future research and speculation about police relations with emergent technology.

Contents

List of tables

List of figures

List of key acronyms and abbreviations

ACPO	Association of Chief Police Officers
APCC	Association of Police and Crime Commissioners
CAA	Civil Aviation Authority
CMOC	Context-Mechanism-Outcome pattern configuration
EBP	Evidence-based policing
HMIC	HM Inspectorate of Constabulary
HMICFRS	HM Inspectorate of Constabulary and Fire & Rescue Services
MCG	Multi-centred governance
NPAS	National Police Air Service
NPCC	National Police Chiefs' Council
RCT	Randomised control trial
SCP	Specialist Capabilities Programme
TMTA	Transformational Model of Technical Activity
WWCCR	What Works Centre for Crime Reduction

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Chapter 1: Introduction

This study explores emergent technological, organisational, and occupational-cultural changes within a specialist drone unit in England and Wales. Sanguine statements are offered amongst drone advocates within the police service and at governmental and commercial levels. The opportunities afforded by innovation are enticing, revealing new opportunities for working, leisure, and crime control. Critics and sceptics, meanwhile, point to dystopian visions of life under drones. The importation of a military-styled technology which has captured the public imagination since the onset of the 'drone wars' in the global borderlands is seemingly replicated in domestic, usually western liberal democracies (Singer 2009; Jensen 2016). New machinations of power and control (Neocleous 2013) and the inexorable march of sweeping surveillance pose an existential threat to life and liberty (Wall and Monahan 2011; Shaw 2016).

This study problematises accounts of the advocates and the critics. It reconceptualises drone policing *in action* in order to examine the ways in which relations between police and technology are mediated and shaped. Drones are not determined in a way which views them simply as fundamental causal agents; technological change is not something which 'happens' nor is it something to be merely endured (Winner 1986: 9-10). Instead, it focuses attention on the myriad contexts into which drone policing emerges and operates within, coupled with the mechanisms which promote it and challenge it. As a consequence, ethnographic research was conducted with an operational support Unit as it developed its burgeoning drone programme over a period of sixteen months. A team of officers had, prior to the commencement of this study, self-selected to undergo pilot training to fly the first drones which the force used to prove the concept that the technology could assist a variety of responsive and anticipatory tasks. Eventually, many of these pilots were flying bespoke and highly advanced drone models procured from a UK-based technology company. The case study force was one of a small number of early adopters of this cutting-edge kit in the country, and this research was carried out in the months which followed the initial 'proof of concept' trial phase.

Drone policing has been a nascent phenomenon since the previous decade. The first force to overtly adopt the technology, Merseyside Police, did so in 2007. By 2017,

twenty-eight of the forty-three territorial forces across England and Wales reported overtly using it (Comparing Police and Crime Commissioners 2017). As of this writing in 2021, the vast majority of the forty-three forces has access to a drone capability. Unlike other technologies used by police – such as Taser, firearms, upgraded vehicles, method of entry equipment, and riot kit – drones are also becoming increasingly accessible to civil actors on a rapidly growing legitimate commercial market. The regulatory landscape has undergone sea-changes in how drone uses are governed, how vulnerable aerodromes are protected, how pilots are held accountable, and how the promises of socio-economic fulfilment are maximised whilst incipient risks of drone related crime and other harms are limited.

Drone policing can firstly be understood as a technological extension to routine police business. Black-and-white images of the heat produced by cannabis farmed at a residential property can be captured through a thermal camera held aloft and manoeuvred into position by a flying drone and used as evidence for criminal proceedings. The same thermal camera can also be used to identify the body heat of a missing person in treacherous terrain, or of a prone suspect hiding in undergrowth after decamping from a stolen vehicle. A flying drone can gain an aerial vantage point over a crime scene and capture images for forensic investigation, using its optical zoom camera to identify a key piece of evidence which may be overlooked by examiners on the ground. Site surveys can be conducted ahead of a state visit to plan a motorcade's optimal route. Commanders can use real-time aerial intelligence to manage the spontaneous outbreak of public unrest after a football match, deploying their officers to critical hotspots or alerting them to danger around a blind corner.

These are examples of the operational nature of drone policing, ripe for empirical study and discussion about the changing technological nature of and extension to police work. They also demonstrate the role of drone policing beyond crime control. This is a tool which is augmenting the omnibus police mandate (see Reiner 1992); police users harness the powers of drone technology itself to augment many aspects of policing. A flying drone is equipped with data-gathering hardware (such as a thermal and optical zoom camera) and acts as a platform to extend the visual register of police on the ground. Data can then be stored, collated, analysed, and actioned either *in situ*, remotely (such as in a briefing or control room), or distributed to partner agencies and the courts. The space beneath the flying drone is therefore transformed into a landscape which is rich with extractable data. Drones can also act

as a ‘force multiplier’ by colonising the air and reassuring (or reminding) those beneath it of a police presence. A flying drone can similarly mitigate shortfalls in staffing and other resources, multiplying the output of a single pilot who is now capable of performing the work of many on the ground.

Drone policing can secondly be understood as part of a process, embedded within and subsequently transforming extant organisational and occupational-cultural settings. The austerity measures instigated by the 2010-2015 Coalition Government still resonate across the extended police family (Hitchcock et al. 2017; Lumsden and Black 2018), with forces experiencing significant reductions in central government funding allocations. In turn, these measures have affected the ability for police to intervene against policing problems, which holds consequences for the public’s trust in the police, perceptions of legitimacy, and its capacity to fulfil its myriad role requirements (Reiner 2010). To confront these challenges, discourses and policy making have emphasised a need to ‘do more with less’; extracting maximum value from an increasingly shrinking pool of resources. This is all taking place in an evolving strategic landscape, defined by dynamic new threats, risks, and harms compounded by globalised criminal organisation, technological innovations capable of outmanoeuvring police control apparatus, and the wider technologisation of domestic civil society. The College of Policing (2020) issued a statement about the future of policing within this landscape, pointing up the strategic challenges confronting it, new and emergent demands which will be placed upon the service, and the need for innovative responses which forecast and can respond adaptively and with agility.

This study asks: *How and why has drone policing been made possible?* In order to address this question, the relationship of policing to this novel technology is conceptualised and a series of initial theoretical propositions are generated from a review of the extant research literature (Chapter 2). These propositions isolate distinct elements of this so-called ‘socio-technical system’ which might plausibly explain how and why drone policing is made possible. In the manner of Layder’s (1998) ‘adaptive theory’ approach, the propositions guide and inform the subsequent analysis and presentation of observational, interview, and documentary data which were gathered and analysed throughout this study (Chapter 4). The first proposition explores the broader strategic involvement of specialised policing capabilities within local, regional, and national policing arrangements (Chapter 5). The position of drones within smaller-scale policing teams such as the case study Unit is explained as an

entrenchment of operational localism. Findings demonstrate that the emergence of drone policing can be explained in terms of the tensions which surround delivery of a specialist air support function. This chapter posits that within this context of programme localism, mechanisms of localised strategic governance supplant national specialist policing functions. As a consequence, drone policing is explained in quotidian, operational terms; it enables service delivery in contexts which require a drone capability and is conditioned by much broader national limitations affecting specialist air support. The second proposition examines the manner in which drone innovation necessarily shapes and is shaped by extant organisational characteristics present within drone policing units (Chapter 6). The organisational resources required to make the drone programme 'work', in the sense that it transitioned from its initial 'proof of concept' phase to more extensive operational deployment as a 'live' force-wide asset, are considered. Findings indicate that the development and diffusion of drone innovation is conditioned by a host of enabling and constraining factors emerging equally from the technical capabilities of a police drone as well as evangelism and resistance amongst police members. The third proposition emerges from the ethnographic tradition of police sociology and occupational-cultural meaning and identity in the face of innovation (Chapter 7). Compelling findings to the effect that drone policing represents both opportunities for learning (a reversal of conventional understandings of police 'blame' culture and inertia) and an extensional threat to what was presented as 'real' policing led to a novel cultural concept: 'enclaves' of cultural practice revolving around drone technology. By exploring drone policing as a cultural phenomenon, the case is made for registering dynamically unfolding value systems which are oriented toward, and sometimes stand in opposition to, conventionally understood identities and meanings attached to police work. The final proposition explores the place of drone policing within a rapidly evolving drone society (Chapter 8). This chapter is more document-focussed and 'speculative' compared to the others. It scans the horizon for drone opportunities and challenges to both police and public, exploring some of the ways in which 'signal events' (Innes 2014a) shape drone regulation. The limits to effective regulation are explored, as are the challenges confronting the police service with regard to keeping pace with an evolving risk landscape. Key findings from this analysis indicate that drone policing should not be considered as a phenomenon which has unilaterally emerged from the police organisation but instead exists within a much broader ecology; police drone

users are just one of a number of new and emergent user groups. How drone policing exists within this context depends upon the interaction of several mechanisms including the negotiation of police power within civil airspace, the limits placed upon police surveillance by national regulations, and the types of police activities which drones are more or less likely to augment. Chapters 5-8 thus meet the study's primary research aim: *developing theoretical knowledge about the emergence of drone policing through empirical case study*. This theoretical knowledge problematises teleological accounts of drones offered by critical social science. Drone policing is reconceptualised in terms of the diverse contexts and attendant mechanisms which interact with one another to condition and make drone policing possible *in action*.

Chapter 3 appraises the value in qualitative, ethnographic-based single case studies for evidence-based policing (EBP). The prevailing EBP paradigm cleaves to methodological purism; systematic reviews and randomised control trials are the 'gold standard' against which all other methodologies are measured (Lumsden and Goode 2016). In response, and because of this study's methodological commitments, Pawson and Tilley's (1997) critical realist contributions to EBP are examined. In particular, this chapter establishes the context-mechanism-outcome pattern framework which enables analysis of how drone policing is made possible by the interaction of the contexts and mechanisms alluded to previously. This chapter thus introduces the study's secondary aim: *contributing qualitative insights into drone innovation to the policing evidence base*. The final chapter of this thesis reports the contributions of this study to empirical understandings of the conditions which make drone policing possible (Chapter 9). Speculations on the future of research in this area are offered, pointing to the need for empirical study of emergent technological phenomena to make sense of how the powers which are made available to technology users are conditioned by social contexts. Findings are also reconfigured along the lines of a realist evaluation of this police programme so as to serve as adequate grounds for further organisational learning (Weiss 1998).

Chapter 2: Conceptualising drone policing

2.1 Introduction

Drone policing raises a series of conceptual problems. It departs from more conventional policing practices in a number of different ways because it represents novel, aerial, remotely controlled and technologically sophisticated means to perform routine police business. This chapter establishes the conceptual foundations of this study. It suggests that in order to accurately understand the relationship of policing to drone technology, 'drone policing' must be formerly understood as a so-called socio-technical system. This study was conducted in the manner of Layder's (1998) 'adaptive theory' approach; a wide-ranging review of relevant and/or promising literatures was therefore conducted to generate a series of initial propositions.

Each proposition isolates a distinct dimension of the socio-technical system of drone policing. More specifically, these propositions were the lenses through which primary and secondary data gathered during the course of this study would be understood. The literature review commences with an ontological determination of the contents of the socio-technical system. It posits that dissolving the boundaries between the social and the technical inhibits a reconceptualisation of drone policing *in action*; instead, the real, causal distinctions between the social and the technical are examined. Discussion then turns to the affordances of drone technology for policing by mapping three separate but related aspects – the technological extension of policing, the colonising and permeating effects of drones in flight, and its capacity as a data-gatherer. The remainder of the chapter sets the scene for the initial theoretical propositions by examining the range of contexts which drone policing relates to, including:

- The central-local axis of police operations and governance. Against the historical backdrop of negotiated police responsibilities, a determined effort has been sustained to retain operational, and therefore localised, control over police drone programmes across England and Wales. This led to the proposition that drone policing is strongly compatible with a de-centralised system of control, thus revealing the political qualities inherent to the governance of drone policing.

- The consequences of austerity on police use of resources. Transformations in policing, including technological change, coincide with broader ruptures to police capabilities. How drones fill gaps in service delivery, and the organisational processes which enable and constrain the effective diffusion of change led to the proposition that organisational structures condition the likelihood of efficacious distribution of innovation.
- The cultural norms and values emerging from the ethnographic tradition of police sociology. It would be remiss to submerge or altogether obscure the significance of occupational meaning-making in the context of police innovation. The proposition to emerge from the review of this literature suggested that drone policing can be explained by examining the cultural values which the technology is imbued with and how it configures within the sense of police identity.
- The broader drone enablement of UK society. Drone policing coexists alongside new and emergent user groups of the technology, each pursuing their own (sometimes opposed) ends. The nature of regulatory power flowing from drone enablement, and the power available to police, was therefore proposed to be diffused across a multi-centred network of actors.

2.2 The tensions of drone policing: defining the socio-technical system

How and why has drone policing been made possible? There are two key but contradictory reasons underpinning this question. The first is that it is posed at a critical juncture in contemporary policing in England and Wales. Widespread availability and accessibility of drones – along with increasingly routine deployment to all manner of policing tasks – points to an organisation in flux. Ostensibly it is embracing change and in order to accurately understand this empirical probing of the forefront of innovation is crucial. There was an ever-present risk throughout this study that its supporting conceptual framework would be incapable of capturing the nuances and the dynamism of drone policing. How could findings be understood in a meaningful way in order to generate theoretical knowledge?

This leads to the second reason and the contradiction. The conditions which support and encourage (or indeed inhibit) its emergence can be seen as neither new nor extraordinary. Drone technology has not just ‘emerged’ and automatically or

unilaterally implicated itself within police organisations. Arrival at drone policing reflects deeper change processes set within the confines of a remarkably enduring policing tradition. This tradition is one of 'policing by consent' which traces its history back to the very foundations of British policing following the 1829 Metropolitan Police Act. During this time 'consent' and its contents (legitimacy, accountability, transparency, appropriateness, and so on) have been the subject of criminological debate (see e.g. Jones et al. 1996; Bowling et al. 2019). Innovation is therefore set against this backdrop of what British policing *means* and *represents*. Of course, consent and legitimacy are contested. The consequences of subject populations (i.e. the public) being drawn further into the instruments of state power are significant. New techniques for control, surveillance, and data-led response necessarily provoke questions surrounding these terms. As Reiner (1992, cited in Jones et al. 1996: 187) states: '"policing by consent" cannot imply complete and universal approval' given the very nature of policing to maintain order and intervene in conflict. Further to this, Scraton's (1999) writing on the 1989 Hillsborough disaster challenges police-centric versions of 'truth' and the powerful ability of the state to subjugate resistant or alternative versions. Jones et al. (1996: 187) point up the need to 'limit the grounds for consent'. Consent was understood in narrow terms and from the perspective of the police which informed the primary data collection aspect of this study. How did officers perceive drone policing? In what ways was it legitimised (or made possible) from within?

From the outset of this study there existed a tension between novelty and tradition, innovation and convention, history and the brave new world of drone policing. Layder's (1998) 'adaptive theory' was therefore the preferred approach to alleviate this tension. Theoretical concepts for understanding drone policing, and which generated the initial propositions which will be explored throughout this chapter, would be continuously developed in the light of data which were subsequently gathered and analysed. Theory and data therefore co-existed in continuous interactive dialogue.

A necessary starting point for this study was to therefore establish a pragmatic conceptual framework for the purposes of generating the initial propositions. The fundamental notion was that drone policing represents a socio-technical system. Regardless of whether it is seen as something entirely novel or as part of broader and deeper historical rhetoric surrounding policing, it was crucial to focus down the

ontological substance of the system under study. Actor-network theory, perhaps the most widely understood conceptualisation of socio-technical systems, proposes that a network might comprise an unlimited number of human and non-human actors (Latour 2005). This leads to a sort of sociological 'n-body problem' whereby the interactions between actors=n become unpredictable, unwieldy, and impervious to pragmatic study. Actor-networks also present a flat ontology: an anti-essentialist standpoint which denies the real, ontological distinctions between the social and the technical regardless of their functional interrelations. As Wood discusses it:

> actor–network theory is characterized by what I term socio-technical conflationism: the fourfold elision of structure, agency, the technological and the social. In socio-technical conflationism, in other words, the technological is social, the social is technological and so it is argued that there is no ontological, analytical or methodological basis for prying the two apart or speaking of separate 'social' or 'technological' factors. This has several key ramifications for criminological investigations of technology. The most considerable of these is that, owing to its anti-essentialism, socio-technical conflation denies its human and non-human actors' different causal powers and properties.
>
> (Wood 2021: 633)

A key point here is that conflating the social with the technical obfuscates the very real differences between the two. The ontological framework therefore incorporated two separate but related components: (i) the social practices and organisation surrounding this emergent style of policing and (ii) the drone as an object with particular technical capabilities.

Determining the socio-technical system

This focus on the combination of the social and technical aspects of drone policing finds its roots in technology studies and, more specifically, the tension between hard and soft forms of technological determinism. Hard technological determinism is associated most notably with Karl Marx's (1847, cited in Heilbroner 1967: 335) classic claim of the steam mill 'producing' industrial capitalism, Jacques Ellul's (1964) staunch take on the 'technological society' and its absorbent techniques of rationalisation, and Robert Heilbroner's (1967) machine-made history, amongst others. Later advocates have also described the form: 'New technologies alter the structure of our interests: the things we think *about*. They alter the character of our

symbols: the things we think *with*. And they alter the nature of community: the arena in which thoughts develop' (Postman 1993: 20, emphasis original).

Whilst technological change has held undeniable significance for human societies across time and place (MacKenzie and Wajcman 1999; Bijker 2001; Misa 2003), hard determinism has been roundly criticised (Winner 1993), even by some of its initial advocates (see Heilbroner 1994). Winner (1980) takes aim at the 'naivety' of such a position and provides a succinct criticism:

> […] the idea that technology develops as the sole result of an internal dynamic, and then, unmediated by any other influence, molds society to fit its patterns. Those who have not recognized the ways in which technologies are shaped by social and economic forces have not gotten very far.
>
> (Winner 1980: 122)

Soft technological determinism, in contrast, enriches a criminological understanding of drone policing which is rooted in critical realism. The 'soft' dimension builds upon Winner's (1980) above criticism by looking beyond the immediate object toward the social contexts of its use. This view therefore revolves around a dual appreciation of the social and technical dimensions of drone policing and how these aspects combine to mutually shape one another. Such a view chimes with Mitcham's (1978: 232) seminal anthropocentric definition referring to 'human making or using of material artifacts in all forms and aspects' and Winner's (1977: 11-12) concepts of *apparatus* (the object itself) and *technique* (the social/technical activities relating to objects). In Ackroyd et al.'s (1992) study of technological change in police organisations, technological objects were observed to have 'social lives' of their own as 'a repository of inter-subjectivities' (Hughes et al. 1988, cited in Ackroyd et al. 1992: 12). The term 'socio-technical system' is therefore illustrative, capturing the interconnection between material object and the surrounding human/social context and the mutual shaping effects between these (Winner 1986; Jasanoff 2006; Marx 2010). This mutual shaping between the elements of the socio-technical system chimes with the depth ontology which is characteristic of critical realism: mechanisms derived from the social and technical elements produce the concrete-real phenomenon of drone policing within the case study context (Sayer 2000: 15).

2.3 'Drone' / 'policing'

What is meant by 'policing' is a nebulous, complex concept in the sociology of policing. Johnston (2000: 7-8) warns against conflating the social function of 'policing' as social control with 'the police' as an organisation of personnel, whereby the former may be undertaken by a diffuse arrangement of actors. For purposes here, 'policing' refers explicitly to the organisation and practices of the specific body of the police service, in keeping with Jones and Newburn's (1998: 18) definition of the 'organised forms of order maintenance, peacekeeping, crime investigation and prevention and other forms of investigation – which may involve a conscious exercise of coercive power'. The recognition of 'organised forms' and its associated practices emphasises the *purposive* nature of policing.

It is now possible to begin to think through the ways in which drones configure within this view. Innes's (2014b: 67-68) matrix of police interventions (people, places, and problems) and actions (protection, patrol, and specialist services) has been adapted in Table 1 below in order to describe the intersections between drone technology and core policing functions.

Table 1. *Drone policing, interventions and activities (adapted from Innes 2014b: 67-68)*

	Intervention population: People	***Intervention sites: Places***	***Intervention foci: Problems***
Protective activity	Extend capabilities to monitor and identify suspects.	Act as 'capable guardians' to deter crime.	'Perch and stare'; Aerial data collection.
Response activity	Visibility, overtness.	Can be unobtrusive; Maximise limited resources and achieve force presence.	Crisis management and response; Live-streaming of real-time data for strategic and operational management.
Specialist service provision	Rapid response enabled by the ability to store a drone in police vehicles and rapidly deploy it (a 'bag-to-air' time of approximately 30 seconds).	Coverage of remote or hostile/dangerous locations.	Keep pace with dynamic harm, threat, and risk landscapes; Achieve value for money, especially compared against police helicopters (see Chapter 5).

It is important to now develop the conceptualisation of drone policing as the combination of social and technical practices in order to separate out what makes a drone 'a drone' and distinct from other technical devices within the police toolbox. The task is to therefore isolate, in thought, what are termed from a realist perspective the 'abstract' dimensions of drone technology, and the inherent causal potentials of drones which may be realised within particular contexts (Danermark et al. 2002). Understandings of how and under what circumstances these abstract dimensions coalesce to produce the concrete-real phenomenon of drone policing develops from this in later chapters.

The following discussion also supports the socio-technical approach taken throughout this thesis which implies that the boundaries between the social and the technical are real. In realist terms, the drone policing socio-technical system is 'externally' related; interactions between the social and the technical are derived from intentional, contingent temporal and spatial relations (Elder-Vass 2017). Collapsing the boundaries between the social and the technical amounts to a conflated analysis (Wood 2021). Drone policing is not reducible to purely social nor technical relations because each has separate causal potentials, conditioned by their separate agencies and the intervening effects of structures which enable and/or constrain that agency.

Extending capabilities

The first abstract dimension, or causal potential, of drone policing emerges from a review of extension theories which can be summarised as technologies 'replicating, amplifying, or supplementing bodily or mental faculties or capabilities' (Lawson 2010: 208). Early extension theorists (see McLuhan 1964; Rothenberg 1993) were in general agreement over this conceptualisation, but more recent discussion has problematised the determination of *what* precisely is extended by technologies (Brey 2000). On McLuhan's (1964) account, a distinction between the human body and cognitive functions is sustained; the body and its organs might be mechanically extended whilst cognition might be extended through computing devices and other electronic devices. The focus is therefore on the intentions which can be extended within these 'sites': 'an extension means that when we make something, we thrust our intentions upon the world' (Rothenberg 1993: 16). Brey's (2000: 66) later work challenges this by claiming that some technologies have no clear morphological analogy. Instead, Brey develops this by considering the means by which intentions are

realised. Furthermore, extensions can occur not only at the individual level, but also at the collective organisational level (Brey 2017: 25). In terms of drone policing, the extended means of policing which are enabled by drones are ostensibly straightforward. A drone equipped with a camera, for instance, provides an aerial vantage point from which an officer can monitor and survey vaster tracts of space compared to an officer on the ground. A flying drone can therefore extend the capacity for the co-ordination of operational deployment of resources, to identify missing and vulnerable persons in unforgiving terrain, or to capture image data during crime scene investigations, for example.

Colonising and permeating

Aerial drones open up new opportunities to colonise the skies. Whilst British policing has routinely used fixed-wing aircraft and helicopters since the 1970s (HMICFRS 2017: 94), drones nonetheless reconstruct their operational spatial environments in unique ways. The colonising dimension is related to the western depiction of police militarisation (Kraska 2007; Salter 2014) and 'high' policing (Brodeur 1996, 2007). Through the entrenchment of 'safe' versus 'hostile' spaces (Chamayou 2015) via remotely piloted means, the critical literature points to the absorbent nature of militarised policing activities, rendering policing space as knowable and manageable through the deployment of high-tech equipment (see also Brodeur 2007; Simpson and Hipp 2019).

Militarisation provides a useful, though problematic, analytical framework for understanding the political consequences which are bound up in military-styled technologies such as drones when they are used by domestic (western) police agencies. Kraska (2007: 6) succinctly defines police militarisation as 'a distinct technowarrior garb, heavy weaponry, sophisticated technology, hypermasculinity, and dangerous function'. It is the embodiment of militarism, a mobile ideology which depicts masculinity as reliant on arms and armament, willingness to use force, and the soldier aesthetic (Kraska 2007; Salter 2014). The fetishisation of military technologies has long been acknowledged in the literature as a means to construct an ideal-typical depiction of masculinity imported from the military (Kraska and Kappeler 1997; Kraska 2007).

The literature tends towards understanding the uptake of technology by police as emanating from *within* the police. Byrne and Marx (2011), for instance, offer two

key techno-fallacies for framing why police acquire technologies. The first *fallacy of novelty* promotes the idea that new technology is better. The second *vanguard fallacy* promotes a fascination with 'fads and fashions'; an institutionalised cultural need to be viewed as an early adopter of technology (Byrne and Marx 2011: 29). In this way, technological choices and uses connect with the institutional culture which portrays technologies as 'silver bullets' to policing problems. This narrative is extant in the recent conversation held by police organisations about the affordances of technology. The *Policing Vision 2025* (Association of Police and Crime Commissioners and National Police Chiefs' Council 2016), for instance, makes the case that technologies are in equal parts enabling, necessary, and a solution to the complex problems confronting the organisation. The Comparing Police and Crime Commissioners (2017: 4) thematic review on police drones similarly attests to the 'huge' potential offered by drones, and former national lead on drones Assistant Chief Constable Steve Barry has repeatedly extolled the virtues of this technology. Benefits offered include cost-savings in comparison to helicopters, enabling access to dangerous or inaccessible spaces, increased operator safety, aerial surveillance, and manoeuvrability.

Technological solutionism of this sort has attracted criticism from some writers on the topic of drone use. For Neocleous (2013: 579), air power comes to define much of the world insofar as the distinctions between military and police power become blurred. A more general process of air power equates state-sanctioned use of drones at home with their use abroad as a 'broad state policy' (Wall 2016: 1122). It is therefore impossible to disentangle the application of drones in war and in policing, according to Neocleous (2013: 587). By occupying domestic spaces, police drones increasingly draw subject populations within the instruments of state power, enabling state interventions into subject populations (Jensen 2016; Wall 2016).

Data collection

The third abstract dimension relates to the drone's surveillant capacity. Surveillance studies have registered technologies capable of capturing, storing, sorting, and analysing data in decidedly dystopian terms: the so-called 'surveillance society' (Marx 2002). Haggerty and Ericson (2000) offer a discussion on the 'assemblage' of surveillance networks diffused throughout western societies, pointing to the manner in which surveillance networks dynamically unfold, empowering increasingly decentralised actors to surveil, and embed sensory technologies into the fabric of social

life in order to manipulate, regulate, and commodify valuable data. The contributions of Foucault (1977) remain within the surveillance literature, with frequent comparisons drawn between (ocular-centric) drones and the panopticon prison which seems to capture the unilateral flow of surveillance power from the state onto subject populations:

> [t]he fact that it should have given rise, even in our own time, to so many variations, projected or realized, is evidence of the imaginary intensity that it has possessed for almost two hundred years. But the Panopticon must not be understood as a dream building: it is the *diagram of a mechanism of power reduced to its ideal form*; its functioning … must be represented as a pure architectural and optical system: it is in fact a figure of political technology that may and must be detached from any specific use.
>
> (Foucault 1977: 205, emphasis added)

This is the most straightforward definition of surveillance: plainly, the one watching the many (Elmer 2003). Foucault's contribution remains in the literature on drones, attesting to the conceptual hold the panoptic surveillance model has on readings of this particular technology. Wall and Monahan (2011) make suggestion of the omnipresent ocular 'drone stare', which speaks to a Foucauldian existential threat to civil liberties. Furthermore, Shaw (2016) makes claims to a 'global panopticon', an 'enclosure' of techno-geographic proportions which captures all within its sweeping net of surveillance. Chamayou (2015: 43-44) similarly evokes the Gorgon (a creature from Greek mythology) and its 'killing gaze' in reference to the armed sensory drones of the 'winged panoptic[on]'.

Discussion

By considering the social and the technical separately (i.e. not collapsing the distinction), it is possible to imagine the ways in which the agencies of both might be enabled or constrained under different circumstances. As stated from the outset of this thesis, empirical exploration of drone policing *in action* confronts and problematises teleological and theoretical accounts of drones. The above literatures provide compelling visions of a society oriented around drones (compelling in the sense that the dystopias they portray might serve as useful boundaries which we might seek to avoid). Yet each of these accounts risks over determining the very real limits which are likely to be placed upon drone policing. The ambitions of the state to control

assumes that drones are capable of such sweeping, totalising, 'enclosing' surveillance. What follows is further argument in favour of taking the social and the technical separately by exploring the ways in which drone policing is enabled and constrained in the police context.

2.4 Technological policing

Policing has arguably always been technological, in the sense that technologies have remained significant tools for strategic planning and law enforcement operations (Hummer and Byrne 2017: 375). From Unit Beat Policing in 1966 which led to the beginnings of vehicular patrols (Holdaway 1977, 1983; Manwaring-White 1983) to the expansion of new surveillance and information technologies since the 1970s (Ackroyd et al. 1992; Haggerty and Ericson 2000; Marx 2002, 2007; Lyon 2003, 2006), police services have routinely deployed technology and as such have become literate in their use. Table 2 below shows a selection of the 'high-tech' which currently furnishes the policing toolbox (see also Byrne and Marx 2011).

Table 2. *'Soft' and 'hard' policing technologies (adapted from Hummer and Byrne 2017: 376)*

'Soft' technologies	***'Hard' technologies***
▪ Record management systems	▪ Drones
▪ Computer-aided dispatch systems	▪ CCTV
▪ Mobile data terminals	▪ Dashboard-mounted cameras
▪ 'Hot spot' mapping	▪ Body-worn cameras
▪ CompStat	▪ Lethal and non-lethal weaponry
▪ Social media	▪ Tactical body armour
▪ Information sharing with the private sector	▪ Biometrics
▪ Databases and predictive analytics	▪ License plate readers

Manning's (2008) ethnography of police use of information technologies nonetheless submerges techno-centric accounts of policing beneath a perennial interest in 'talk'. Talk, it is suggested, is pivotal to police relationships to the public and others within the organisation, rendering the police organisation as decidedly low-tech in comparison. This thesis contends that the rapidity with which forces are currently seeking out drones problematises the importance of 'talk'. Talk might still be a crucial tool, but discourses emanating from practitioners seemingly emphasise more high-tech ambitions: '[Drones] have the potential to *change the way* we police by working with

other technologies and updating traditional methods of foot and aerial patrols' (Assistant Chief Constable Steve Barry, quoted in National Police Chiefs' Council website, 2017, emphasis added). This quote evokes the transformative potential of drone technology for policing. "Change the way" implies 'novelty'. "Updating" implies 'outdated'. "Potential" implies 'possibility' and perhaps also 'uncertainty'. The affordances of drone technology to policing are evidently vast, with many forces having demonstrated their value in search-and-rescue, crime scene investigations, operational planning, and so forth (see Chapter 1). Crucially these uses harness the potential of drone technology to act as a flying platform to which data-gathering hardware and software are affixed for the purposes of gaining an aerial vantage point (i.e. are the concretisation of the foregoing abstract dimensions). Claims about transformation need to be considered critically, however, because these claims can be made without substantiation. Transformation is not a straightforward process and is closely aligned with the particular social contexts into which drones must emerge.

The Transformational Model of Social Activity (TMSA) (Bhaskar 1989; Archer 1995) and its development into the Transformational Model of Technical Activity (TMTA) (Lawson 2007, 2008, 2010) offers crucial insights into the process. The TMSA firstly highlights the effects of structures upon agencies; the former pre-exists the latter, but agency reproduces or transforms these structures. The TMTA develops this further by suggesting a crucial departure from the TMSA in that,

> the social activity that the TMSA is designed to capture is actually part of technical activity. It is the social relations of the TMSA that are reproduced and transformed in technical activity, as well as being enabling and constraining of that activity. However, *technical activity is about more than simply reproducing or transforming social relations*. The causal properties of material objects are harnessed and put to work in a process of isolation and reconnection that stretches across the activities of design and use.
>
> (Lawson 2008: 54, emphasis added)

The notion of 'technical activity' is critical for my purposes here because it enables deeper insight into how drone policing, as a technical activity, coincides with broader structures of police organisation. That drone policing is a technical activity highlights how the causal potentials of drone technology itself become harnessed in particular operational contexts. These causal potentials were previously defined and the contexts in which these potentials may (or may not) be triggered will be proposed below.

Moreover, Lawson's (2008) work on the TMTA offers the addition of technological *harnessing* by which users firstly identify the potential affordances of a technology and secondly integrate the technology into extant practices and organisational structures. Police drones appear to offer transformative potentials to the contemporary police service, proposed as solutions to problems, which are (supposedly) set to transform the nature of police work.

2.5 Local operational drone delivery

Winner's (1980) seminal question, posed in an article titled *Do artifacts have politics?* draws attention to objects (artifacts) as possessing political qualities. Borrowing from Edmund Husserl, Winner advocates for returning '*to the things themselves*' (Winner 1980: 123, emphasis original); the design, development, and implementation of technologies reveals inherent politics and leads to political problems. Winner's thesis is twofold, premised on the notion that objects contain political properties which arrange social relations of power as well as order related activities. Firstly, objects are means through which societal problems can be technologically addressed (Winner 1980: 123). This 'problem-oriented' view of technology is rife in the police policy discourse, enshrined in mantras such as 'doing more with less' and the reform efforts under technological proficiency and increasing sophistication of police work (to be explored further below and in Chapter 4).

Secondly, technologies are 'strongly compatible with' particular forms of social organisation (Winner 1980: 123). At this writing the vast majority of the forty-three territorial forces across England and Wales have access to a drone capability. Some neighbouring forces – for instance Surrey Police and Sussex Police, Devon and Cornwall Police and Dorset Police – have entered into drone sharing arrangements, pooling financial and knowledge/experience resources to establish cross-border drone programmes. Other forces, such as Humberside Police, share capabilities with the local Fire and Rescue Services. Elsewhere and more recently, Neath Port Talbot council joined with South Wales Police in enforcing Covid-19 social distancing measures, with the Police providing hotspot intelligence for the local authority to monitor and disperse gatherings using the council's drone technology. To give a sense of the momentum of drone adoption across England and Wales, Merseyside Police were first to adopt in 2007, as of 2017 25 forces were overtly deploying this

technology (Comparing Police and Crime Commissioners 2017), and as of 2021 the national picture is one of widespread adoption.

Significant differences exist between these drone programmes. Differences in terms of the types of technology used by forces mean many use off-the-shelf solutions to furnish programmes, going to 'big brand' companies such as DJI or Aeryon. Exceptions to this, such as the case study Unit and a growing group of later adopting forces, have procured equipment from UK-based manufacturers, signifying an emerging designer-user relationship and the embedding of police needs into drone designs to meet these (see Chapter 5 on 'police proofing' technology). Until recently[1] there was no streamlined procurement process for drone acquisition and, in turn, the financial investments made by forces and the types of drone equipment in use differed considerably. This led to the HM Inspectorate of Constabulary and Fire & Rescue Services (HMICFRS 2017: 56) inspection of police air support to state that many forces were making 'procurement decisions without expert guidance'.

The above differences speak largely to financial challenges – ensuring investment to achieve best value for instance – which are beyond the scope of this thesis' interest but are no doubt critical problems for future research on technological investment strategies. Instead, what is of interest is explaining *why* drone policing exists in this fragmented way. Does this distribution reflect some inherent quality of drone policing? That it must be delivered in such a way and that programmes necessarily develop in this compartmentalised manner? Or is drone policing more *compatible with* differentiation between programmes? And could it be delivered differently? There is perhaps nothing necessary about programme differentiation. The delivery of fixed-wing and helicopter support via the National Police Air Service (NPAS) has followed a centralised partnership model since 2012, with forces entering into a client arrangement with the NPAS 'lead force' West Yorkshire Police and each contributing a portion of their budgets to fund it. Staffed aircraft are analogous to drones in the sense that both provide air support to police, although there are differences in terms of the capabilities and limitations to both staffed and unstaffed technologies.

[1] The public sector procurement service YPO launched its 'Drones and Associated Products and Services' framework in 2020 in collaboration with the Home Office. The framework supports emergency services in purchasing drones and drone accessories with the aim of achieving best value for money. See https://www.ypo.co.uk/news-and-events/news/ypo-launches-first-public-sector-drones-framework [Accessed 7 March 2020].

The above questions chime with Lewis Mumford's (1964) typology of *authoritarian* and *democratic* socio-technical systems. On one hand, and in its most narrow and immediate form, drone policing is delivered by an officer remotely controlling the machine. The officer manipulates the flying drone to extend their visual register, to occupy and project their presence across space, to capture digital data. It is a practical necessity that the drone is only controlled by a single pilot and therefore the 'authoritarian' nature of drone policing is displayed in microcosm. On the other hand, considering the national picture of drone delivery, programme differentiation is 'democratic' in the sense that this complements, or is at least compatible with, the (re)affirmation of the local within operational policing (Winner 1980: 130).

A local socio-technical system

Localism is an intractable, yet contested, theme within policing in England and Wales and cannot be disentangled from its opposing term 'centralisation'. Centralisation implies a strong so-called 'core executive' in the form of central government exerting top-down control/power (see Edwards 2016). In historical context, the 'centring' of power within the office of the Home Secretary followed the Police Act 1964 which, in theory, sought to build a tripartite governing arrangement between the Home Secretary, chief constables, and local police authorities. In practice, however, this structure was criticised for its 'centring' of power within the office of the Home Secretary; central control was exerted upon local affairs via mechanisms such as the National Policing Plans and central government funding grants. Therefore, priorities and accountability were dislocated from local chief constables and police authorities and located instead at the level of central government. Arguments to this effect were made in the House of Commons Home Affairs Committee (2008) Seventh Report. The Local Government Association at the time claimed:

> The Home Secretary's powers through the setting of priorities and targets via the National Policing plan plus those resulting from the funding and audit and inspection regimes dwarf those of the police authority […] The consequence of the gradual weakening of police authorities over the 40-year period since the passing of the Police Act, is that *the connection of the police to their local communities has been severely reduced*. As a result the Home Secretary is the only visible politician who can be called to account for the way the police work.

(cited in House of Commons Home Affairs Committee 2008: n.p., emphasis added)

The central-local axis has been criticised in recent studies for its reaffirmation of the central core executive within local affairs (Jones and Lister 2019). Agencies acting on behalf of the state, such as the College of Policing and the national Inspectorate, and centralised funding arrangements via Home Office grants each assert the power of the centre over territorial forces, whether through setting of national standards, making recommendations for strategic policy prescriptions, or control over budgets respectively. Jones and Lister's (2019) definition of localism as a 'gift' is problematic in the particular context of drone programmes. The definition assumes *a priori* that a core executive exists in the first place; that power flows through and from an 'obligatory passage point' (Edwards 2016). Rather, it is more beneficial to register the powers of local drone policing not as a gift but as a possession by fiat. There is considerable operational independence for drone programmes, not only from central regulation but also from local democratic accountability via Police and Crime Commissioners (an important point but one beyond the scope of this thesis given its more explicit focus on the internal, local nature of regulation by *police*). As the former NPCC lead on drones, Assistant Chief Constable Steve Barry, stated: 'Deploying drones is a decision for individual chief constables who ensure that they are used appropriately in the interest of public safety and efficient allocation of police resources' (quoted in NPCC website, 2017). This reconfiguration of power as strategically held by local drone programmes chimes with the Latourian (1984) 'paradox' of power: the substantive difference between power which is simply held (*in potentia*) and power which is exerted (*in actu*). Power to govern drone programmes is held within local programmes and this power is exerted in the *absence of* centralised power exerted by a conventional core executive. This view of power as strategically located within local innovation hubs resulted in the initial proposition concerning the type of governing arrangements drone policing would be most compatible with which forms the focus of Chapter 5.

2.6 Organisational settings of innovation

Unit Beat Policing is an appropriate historical example to explore as a means to understand the relationship of policing to other programmes of innovation. As stated previously, the police organisation is not commonly associated with innovation

especially based on findings that prevailing cultural attitudes toward change 'often sees promising ideas rejected because they were "not invented here"' (Innes 2013: 7). Change can oftentimes be seen as something 'done to' police rather than something which can emerge organically or otherwise 'bottom-up' in local innovation hubs, as was the example set by the case study Unit. Unit Beat Policing exemplifies the challenges associated with implementing change within police settings, and invites further consideration of related conceptual work around technology diffusion.

Transformation in policing: the example of Unit Beat Policing

The Home Office Research and Planning Branch introduced Unit Beat Policing in 1966 to supplant traditional foot patrol with vehicular, telecommunications, and computer technologies (Gregory 1968; Holdaway 1977; Manwaring-White 1983). The intention was to improve efficiency by improving police coverage and reaction time, as well as reducing staffing needs and associated costs. The potential implications of this new style of 'mechanised' policing (Ackroyd et al. 1992) were identified early on, with Chief Superintendent Eric Gregory (1968) presenting to the Home Office a series of technical specifications in need of address. The issues at this stage revolved around technical adequacy (selecting the correct radios and vehicles), organisational requirements (supervision and managing intelligence flows), and training. There were also concerns over the potential changes mechanisation might hold for police–community relations; Gregory (1968: 6) observed that '[officers] in vehicles do not cultivate a better [public] understanding with the police', and Ackroyd et al. (1992: 73) and Sharp (2005) emphasise the unintended consequences of it reaffirming the police's reactive role and focus on respective crime detection. Furthermore, findings from Holdaway's (1977) classic covert research with the pseudonymous 'Hilton' sub-division found evidence that the Unit Beat system supplanted traditional foot patrols and 'if one couldn't get a ride in a motor vehicle, P.C.s tended to adopt a number of strategies to remain in the station' (Holdaway 1977: 125).

Technological uptake is a contingent process, replete with unintended or unanticipated consequences (Marx 2007), implementation failures based in technical or organisational barriers (Koper et al. 2014), and failures to capitalise on the enabling potentials of technological innovation (Lum et al. 2017). This suggests that *variation and selection* are integral to organisational views on innovation (Pinch and Bijker

1984) and that *interpretive flexibility* occurs differently across organisational contexts in reference to organisational aims. It also requires particular conditions which recognise the value of technology to tasks, sustain an environment within which technologies thrive, and a recognition of the ways in which technologies can be applied.

Rogers (2003: 12) advances a *diffusion* theory of innovation premised on the definition of innovation as 'an idea, practice, or project that is perceived as new'. Diffusion refers to 'the process in which an innovation is communicated … among the members of a social system' (2003: 5), and technological uptake is a decision (2003: 177). The focuses on decisions – technological choices – and the perception of newness are significant and relate to Goodhue and Thompson's (1995) 'task-technology fit' theory. For Goodhue and Thompson (1995: 216), task-technology fit is 'the degree to which technology assists an individual in performing his or her portfolio tasks'. Technologies are viewed as tools used by individuals in furtherance of tasks, which in turn are described as the actions individuals take to produce outputs (Goodhue and Thompson 1995: 216). This theory was applied to police use of mobile computing technologies by Ioimo and Aronson (2003) who reported a dim view of the efficacy of computing to improvements in frontline officers' productivity. They assessed that officers felt that the technology was not *directly* assisting their work; the gap between task requirements and technological functions was too great to prompt significant changes in the way officers deployed computing technologies. Furthermore, Lum et al. (2017) configure task-technology fit theory within Orlikowski and Gash's 'technological frames', referring to:

> the assumptions, expectations, and knowledge [members of an organisation] use to understand technology in organizations. This includes not only the nature and role of the technology itself, but the specific conditions, applications, and consequences of that technology in particular contexts.
>
> (Orlikowski and Gash 1994, cited in Lum et al. 2017: 138)

Task-technology fit theory requires some adaptation at this point. Its explicit focus on the means–ends relationship does not delve deeply enough into the dynamics of the occupation as more than simply its intended outcomes. The theory is restated in light of this criticism as follows: Technologies come into contact with the norms, values, practices, and ideas of the police occupation. Whether a technology will thrive

therefore depends upon the extent to which these occupational attributes become inscribed onto the technology. It follows that some technologies will 'fail' to integrate into their social context, and that others will 'succeed'. The processes involved to reach either result forms much of the analysis in Chapters 6 and 7.

Technologies also emerge alongside wider currents which shape organisations (Ackroyd et al. 1992: 13). One such current relevant to understanding the emergence of drone policing is economic. The legacy of austerity following the 2008 recession has refocused police and wider public sector narratives around achieving value for money and 'doing more with less' (Innes 2014b). Austerity measures introduced by the Coalition Government confronted the police service with significant challenges, the effects of which are still noticeable across the extended police family (see Hitchcock et al. 2017; Lumsden and Black 2018). The HM Inspectorate of Constabulary inspection *Adapting to Austerity* (HMIC 2011a) outlined provisions made in the October 2010 Comprehensive Spending Review to cut 20 per cent in the central government funding grant to forces in England and Wales by 2014/15; this amounted to an estimated £2.1 billion reduction. Plans to meet this spending cut by 2014/15 primarily focussed on reducing the workforce by 34,100 (police officers, police community support officers, and police staff) and reducing gross revenue expenditure by 14 per cent. The subsequent inspection *Policing in austerity: One year on* (HMIC 2012) found that all forty-three territorial forces had developed satisfactory plans to meet these reductions but spelled out the difficulties inherent to workforce reduction. Reducing the frontline, defined as police officers whom 'are in everyday contact with the public and who directly intervene to keep people safe and enforce the law' (HMIC 2011b: 6), presents a host of critical consequences but can help frame the reasoning underpinning the service seeking out technologies which can help them 'do more with less'. In their 2014 inspection *Meeting the Challenge*, HMIC reported a dim view of the police use of technology and the need to improve current infrastructure: 'overall the police use poor and outdated technology' (HMIC 2014a: 101). Recent attempts have been made to rectify this – Police and Crime Commissioners established the Police ICT Company in 2015 – but productivity is closely linked to resource input–output ratios; in austere times, inputs have been reduced to 'achieve the same or better outputs' (Hitchcock et al. 2017: 16).

In many ways, the police service functions akin to most other large bureaucratic organisations (Bacon 2014). In a strict Weberian sense, they are

hierarchical, have a developed division of labour, a career advancement structure, and 'above all else, a distinct "office" of constable' (Johnston 1988: 52). 'New Public Management' reforms under the Conservative government of the 1980s, for instance, introduced decidedly business-like terminologies into police work, replete with customer focus, performance indicators, and modernisation initiatives (Johnston 2000; McLaughlin 2007). From an organisational perspective, doing more with less is an obvious goal. Given the police mandate to 'regulate and protect the social order' (Reiner 1992: 761), technological solutions to confronting the challenges which threaten social order are bound up in strategies of efficiency and effectiveness. These strategies become more pressing given the demands placed on the service by an ever-changing social, political, and economic environment (Loader and Mulcahy 2003; Bacon 2014).

The legacy of austerity has fed an organisational investment in technologies which do more with less. The *Policing Vision 2025*, produced by the Association of Police and Crime Commissioners and the National Police Chiefs' Council (APCC and NPCC 2016), represents a landmark document for laying out the future of the service. Their *Vision* aims to transform the police service, encouraging localism, accountability, and multi-agency working to meet diverse contemporary challenges. It also recognises the transformative potential new technology offers to achieve these aims: it is in equal parts enabling, necessary, and a solution to the complex challenges confronting the police and the public. Harnessing these potentials is a primary aim of the police service, which partially explains why forces across England and Wales are increasingly adopting drones. The following excerpts from the *Policing Vision 2025* are indicative:

> The increasing availability of information and new technologies offers us huge potential to improve how we protect the public. It sets new expectations about the services we provide, how they are accessed and our levels of transparency. […]
> The public expects us to protect them from harm. The only way we can address the new policing challenges with this smaller resource base, without reducing the quality of services, is by transforming our approach to policing.
>
> (APCC and NPCC 2016: 6)

2.7 Occupational culture: meaning-making and identity

Occupational cultures are defined as 'a product of the various situations and problems which all vocational members confront and to which they equally respond' (Paoline 2003: 200). Whilst the police are not unique in cultivating and expressing an occupational culture, they nonetheless have been subject to much scholarly attention working in the ethnographic tradition due firstly to their mandate as maintainers and regulators of social order (Reiner 1992: 761) and secondly due to the specific pressures confronting them in the discharge of this duty. Van Maanen (1973) makes the case that police have constructed a unique sense of identity in response to these issues. The interest in conceptualising drone policing as an occupational-cultural phenomenon introduces one of the study's initial propositions, which suggested that occupational-cultural context would be an important site for meaning-making and meaning-attribution to drone technology itself. This proposition is supported in various studies of policing technologies. Manning's (2008) ethnographic study of police crime mapping software argued that technology use is informed by the structure and culture of policing. Lum et al.'s (2017: 157) case study of police information technology systems similarly concluded that officers' perceptions of efficiency afforded by such technologies was mediated by salient cultural and organisational characteristics such as discretion and internal relationships. It also re-iterates Lawson's (2007, 2010) claims on the TMTA which suggests that technologies are 'harnessed' when they are incorporated into pre-existing social practices.

Early police ethnographies were conducted with a view to understanding the myriad ways in which officers, particularly those populating the lower ranks, cope with the stresses of police work and exercise considerable discretion in the discharge of their duties (Paoline 2003). Skolnick's (1966) classic statement of the 'working personality' of the American rank-and-file explains the culture as generated in response to the interdependent variables of *danger* which pervades their work as law enforcers and of the *authority* they exercise which attracts this, combined with managerial pressures to achieve results. (Skolnick developed Westley's ([1950] 1970) earlier ethnography on the coping mechanisms officers express to shield themselves from these hazards.) In Britain, Banton's (1964: 127) seminal study highlighted the difference between 'law officer' and 'peace officer' roles, with the latter explaining the majority of police time spent maintaining peace without recourse to exercising

powers of arrest. This discretion was also evidenced in Goldstein's (1963) American research which compared the 'ideal' of law enforcement with the 'reality' that officers (and managers) often display significant discretion in performing this duty. The police, therefore, are seen to perform a more symbolic, rather than instrumental, role in society (Holdaway 1983), which attests simultaneously to the broadness inherent to interpreting the law by practitioners (Klockars 1985) as well as to the routine practice of policing which may involve danger. The police occupational culture as a coping mechanism has thus been defined variously by Holdaway (1983: 2) as the 'associated strategies and tactics' which act as guides for the 'day-to-day work of the rank and file officer' and by Reiner (2010: 118) as it then offering a 'patterned set of understandings that helps officers cope with the pressures and tensions confronting the police'. More broadly, and in the light of police discretionary powers, the culture has also been described by Manning (1989: 360) as 'accepted practices, rules, and principles of conduct that are situationally applied, and generalized rationales and beliefs' and by Chan (1997: 43) as 'informal occupational norms and values operating under the apparently rigid hierarchical structure of police organisations'.

Core occupational norms existing amongst the lower ranks have been observed as: sense of mission; orientation toward action; cynicism and pessimism; suspicion; isolation and solidarity; conservatism; machismo; and racial prejudice (Holdaway 1983; Chan 1997; Loftus 2009; Reiner 2010). This characterisation has sometimes informed derision of the police's negative traits: Waddington (1999: 287) suggests it is 'invoked by academic researchers and commentators to explain and condemn a broad spectrum of policing practice'.

Subsequent research evidence has challenged the conceptual primacy of the earlier classical accounts, taking aim at the assumption of a monolithic and homogenous occupational culture. As Fielding (1988: 157) states, '"the" occupational culture is actually many subcultures'. Wilson's (1968) classic study of police behaviour in eight American communities distinguished between heterogeneous organisational styles across departments: (i) legalistic styles emphasise crime-fighting; (ii) watchman styles stress order-maintenance and community-oriented policing; and (iii) service styles emphasise community satisfaction as an organisational objective. The expression of these styles is dependent upon the occupational environment in which the police operate: a high-crime urban locality, for example, would orient frontline police toward a legalistic style, whereas those operating in a service style

department may be less inclined to exhibit suspicion or prejudice in their dealings with the public (Paoline 2003: 205).

Reuss-Ianni (1983) distinguished between 'street cops' and 'management cops', recognising the existence of an occupational culture but fragmenting it across the roles within the New York Police Department. Street cop culture, then, is expressed amongst the lower ranks but is subject to the effects of changes in management orientation toward accountability and efficiency, the pressures of resource allocation, demographic changes within the police, and the expansion of job opportunities made available through officer education. Management cop culture, therefore, is similarly aligned with the street cop culture (insofar as they are both oriented toward crime reduction and law enforcement) but deviates in that it expresses traits such as rationalisation, efficiency, and accountability which it imposes on street cops (Reuss-Ianni 1983: 6). Manning (2007) similarly attests to an occupational cultural distinction based on the top-down hierarchical structure between investigators, patrol officers, middle management, and top-command. This structure informs the ways in which occupational members interact and how they make sense of their work.

Furthermore, in Britain, Cain (1973) determined a fragmentation in 'the' culture dependent on urban or rural locality, suggesting police occupational culture is subject to the spatial environment in which it occurs. Hobbs' (1988) classic ethnography of East London detectives also discussed a unique relationship between detective culture and the environment of East London, again suggesting that the culture responds to surrounding external factors. Finally, Punch's (1979: 133) study of Amsterdam police found that the informal code of policing was deeply entrenched in the 'specific cultural norms of cosmopolitan inner-city life'. Regarding drones, a distinction between urban and rural drone policing has recently emerged with the establishment of England and Wales's first permanent drone squad maintained by Devon and Cornwall Police since 2016. The rural challenges confronting Devon and Cornwall Police, such as wildlife crime and accessing hard to reach areas such as woodlands and cliffs for person searches (Devon and Cornwall Police website, 2018) differ from those confronting their urban counterparts. Urban drone policing has to consider the hazards of flying drones over populated urban areas, and they have been deployed in support of drug raids, operational planning for public events, and public order policing in cities (Comparing Police and Crime Commissioners 2017).

In further criticism of the notion of a monolithic culture, Bacon (2014) makes the case that officers, especially those occupying lower ranks, are not cultural and institutional facsimiles. Acculturation is the process through which the occupational culture is transmitted between occupational members, but it is important not to understate the significance of individuals' own biographies and what they bring to the occupation as members. Chan's (1997: 73) Australian study of police racism, for example, found that members are not 'passive carriers of police culture'; the culture and the practice of policing do not determine one another and members play an 'active role' in 'developing, reinforcing, resisting or transforming cultural knowledge'.

Waddington's (1999; also Hoyle 1998) significant study of 'cop' and 'canteen' cultures provides a useful means to conceptualise this process. The former culture refers to the norms and values members express in their day-to-day work; the latter to the norms and values held by officers when off-duty which play a role in the transmission of cultural identity between peers. This has been observed by Shearing and Ericson (1991) in their study of the occupational culture as a figurative resource transmitted through storytelling, which in turn furnishes their repertoire of experience. Shearing and Ericson (1991: 488) note an 'unequivocal' response amongst occupational members which claims that they draw from their experience to 'articulate the rules that generate their action'. In this understanding, police practice is not done according to 'the book', but is instead a contingent practice which affirms police as 'craftsmen' (Skolnick 1966) who make use of their discretionary powers informed through the stories which construct their bank of cultural and experiential resources. Furthermore, stories are representations of the world as perceived by occupational members: they are not factual but instead uncover some essential nature of the work and the world; they are exercises in experimental subjectivity (Shearing and Ericson 1991: 491). The proposition to emerge from the review of the ethnographic police literature revolved around the notion that identity and meaning-making would be inextricably connected to how drone technology would be 'harnessed' and made sense of by occupational members (Lawson 2008). Drones would need to connect with the extant cultural repertoire of police members of the case study Unit in order to effectively integrate within its surrounding community. Again, the distinction between the social and the technical is sustained by suggesting that there would be nothing necessarily automatic in how drones would be received; drones are externally related to policing and as such must contend with extant social relations.

2.8 Policing (in) a drone-enabled society

The fourth initial proposition explored in Chapter 8 concerns the position of drone policing within a wider drone-enabled society. On one hand, drone policing can be seen as an extension to conventional policing tactics; it extends capabilities in new, vertical, and aerial ways. As such, it is regulatory in the sense that the technology enables police to more comprehensively colonise and permeate aerial space as well as bear down on subject populations using advanced broad-spectrum data gathering and analytical devices. On the other hand, widespread availability of drones on legitimate consumer markets have spurred new regulation efforts from the state. As such, the proposal is that drone policing empowers police to regulate aspects of social life with the caveat that *what is to be regulated* is simultaneously changing. There is a wealth of literature surrounding hostile drone uses and there is a speculative element to it in the sense that future threats ought to be anticipated. However, the interest for this study is to what extent those anticipated challenges are recognised and planned for within a drone policing Unit. Does access to a drone mean Unit officers are more alert to the threats they could pose?

In order to understand the (nascent) relationships between drone users and drone regulators, police and public, etc. it is necessary to consider how drone technology is facilitating entirely novel and unprecedented capabilities for its users to regulate the activities of others, and to subvert or outflank regulatory attempts imposed upon them by others. It highlights, ultimately, the shifting dynamics of power away from conventional centres, such as police, and down and across into diffuse regulatory *centres*. Edwards' (2016) notion of multi-centred governance (MCG) provides a framework for registering how multiple, even rival, centres of power might come to predominate within a drone-enabled society. Power, the framework suggests, flows through and between multiple 'obligatory passage points' or centres (Edwards 2016: 246). This power is articulated along three complementary lines: the causal potentials available to these centres to act; the dispositions or 'rules of practice' which shape relations between centres; and the technologies which facilitate new and emergent courses of action (Edwards 2016: 246, 251).

Alongside the vast societal and economic benefits purported by drone advocates, their potential to also be turned to criminal, malicious, and hostile ends

exists. The abstract dimensions of drones outlined previously speak to enduring, obdurate causal potentials which may (or may not) be triggered in certain contexts. Just as drones are set to revolutionise the transport of commercial goods (as in the case of Amazon's tentative plans for a drone delivery service), so too may they revolutionise the transport of illicit goods into prisons. Similarly, their ability to extend the visual register of police also extends the visual register of criminals conducting counter-surveillance or voyeurism. International media have reported on a range of (relatively rare) incidents, including the attempted assassination of Venezuelan President Nicolás Maduro by an explosive-laden drone, undetected drones alighting on the lawn of the White House in the US, and a drone depositing radioactive materials on the roof of Japan's prime minister's office. UK reports are also highlighting the risk of 'spoofing' of flying drones which raise significant public safety concerns (as well as concerns with the security of on-board software and its vulnerability to hacking) (Haylen and Butcher 2017). Although the empirical focus of this thesis is on a case study police force which uses drones, it is difficult to examine this move toward wider police technologisation as separate from the emerging drone-enabled landscape ushered in by claims to 'smart cities' (McGuire 2018). Drone policing therefore exists within an ecological system of other users pursuing their own, sometimes diametrically opposed, ends (see Ekblom 2005, 2017) and this ecology is examined in national and local context in Chapter 8.

2.9 Conclusion and formulation of initial propositions

This chapter has provided a conceptual overview of the research question and a critique of the literature consulted throughout this project. The socio-technical system remains the most compelling approach toward understanding drone policing as the joining together of distinct human and technological units of analysis. How these interact with one another, as drone technology embeds within policing, has provided insights into some of the themes which will emerge in later chapters, especially surrounding the transformational effects of drones on local operational policing, its culture, and its operational practices. Discussions surrounding technological policing has provided historical context to the explanation of how and why drone policing has been made possible, by considering the ways in which the service has adapted to technological change. Furthermore, considering the emerging context of drone-

enabled civil society has established interest in, and need for, research at the cutting edge of technological change.

The preceding literature review drew attention to the different ways drone policing was conceptualised ahead of this study. The selected literatures each spoke to a particular aspect of drone policing – its ontological substance, how innovation shapes organisations, the significance of occupational culture for framing technological adoption, and so on – and indicative questions and explanations were raised. These are the literatures which were 'adapted' throughout the study; they informed the initial propositions but were anticipated to be modified, specified, and/or rejected based on subsequent data analysis (Layder 1998). Below are the initial theoretical propositions which emerged from this review and which respectively form the analytical foundations for the proceeding findings chapters:

P_1	The delivery of drone policing is likely more compatible with a de-centralised or local structure as opposed to a centralised structure.
P_2	Drone technology must enrol within an organisational structure which enables and sustains innovation.
P_3	Occupational members must attribute drone technology with socially significant meaning for it to be valued as an operational tool. This meaning is informed by prevailing occupational-cultural frameworks.
P_4	Drone policing empowers police to regulate certain aspects of the social world due to the technical potentials of drone technology.

Chapter 3: 'What works' and theory-driven evaluation research

3.1 Introduction

This chapter is focused explicitly on the study's second aim which was to demonstrate the value of qualitative, single case study for making contributions to the evidence-based policing (EBP) paradigm. The evaluative aim of the study was informed by Pawson and Tilley's (1997) realistic evaluation model, as much a criticism of prevailing 'scientific' methodological commitments as it was an attempt to make EBP more receptive to alternative (realist) contributions. Furthermore, given the overall argument pursued in this thesis invites a reconceptualisation of drone policing *in action* as opposed to *in thought*, this chapter sets out the context-mechanism-outcome pattern configuration which enabled exploration of the interactions between diverse contexts of drone policing and the mechanisms which explained how it was made possible within these contexts. This chapter performs a bridging function between the preceding conceptualisation of drone policing which led to the initial propositions and the proceeding chapter which establishes the methodological dimensions of the study.

This study does not emulate more conventional police evaluation studies. The intention was not to understand the impacts of drone policing on crime prevention or to consider the effects of drones on police-community relations, to take two common themes of police evaluations (cf. College of Policing (2021) Crime Reduction Toolkit). Instead, this evaluation research limited its focus to a very specific set of initial propositions seeking to explain *how and why drone policing is made possible*. The reason underpinning this was a direct response to the lack of other evaluations on drone policing as identified by HM Inspectorate of Constabulary and Fire & Rescue Services (HMICFRS 2017: 86) – in the absence of other evaluation studies it was necessary to look to alternative strategies for carrying out a piece of research with an evaluative sensibility.

3.2 The state of 'what works' research

As stated in Chapter 1, this study's secondary aim was to be relevant to practitioners by conducting a realistic evaluation of drone policing. Some of the issues involved with police evaluations are methodological and will be visited in Chapter 4. But the

form of *realistic* evaluation proposed here, following Pawson and Tilley's (1997) seminal text, is an inherently theoretical approach which has consequences for the conceptualisation of drone policing. This section will firstly critically overview the conventional paradigm of police evaluation before stating the importance of an alternative, theory-driven model. It then moves onto the efficacy of qualitative 'research evaluation' (Shaw 1999, cf. Lincoln and Guba 1986) within the realist tradition.

The police service is undergoing significant changes in relation to its professional identity, with an increasing focus on developing a knowledge base for informing best practices (van Dijk et al. 2015; Holdaway 2017). Combined with the current context of limited budgets, performance targets, and the dynamic challenges of new crime problems, Innes (2010: 128) makes the case for research *with* the police which can contribute to the knowledge base and inform decision-making through the co-location of researchers and practitioners. Research can thus serve as both 'mirror' and 'motor'; the former function refers to research aimed at reflecting the realities of policing and understanding what they do and why, the latter relates to research oriented toward improving practices founded in innovative research findings (Innes 2010). This stands in contrast to the 'dialogue of the deaf' (MacDonald 1986 in Bradley and Nixon 2009), in which academics and police practitioners remain unsympathetic to each other's perspectives and which can result in communication breakdown. As Chapter 4 will demonstrate, this study adopts the position of a constructive critique of policing practices, a position within which inhere unique political relations between researcher and researched. The case will be made that critical research can improve knowledge about policing to rescue criminology from the margins of policy relevance (Austin 2003; Currie 2007; Matthews 2009, 2010). The following section, in providing some historical and conceptual background to police research, shall set the scene for the discussion on the politics and purpose of police research which occurs in the following chapter which are, arguably, methodological issues.

The What Works Centre for Crime Reduction

The current research paradigm seeks to develop the evidence base for purposes of understanding 'what works' in crime prevention (Reiner 2010; Lum et al. 2011; Braga and Weisburd 2012; Braga et al. 2012; Fyfe and Wilson 2012), though calls for EBP

were initially made by Lawrence Sherman in 1988, asserting 'police practices should be based on scientific evidence about what works best' (Sherman 1988: 2). EBP is a strand of the College of Policing's core objectives and is bound up in the process of police 're-professionalisation', observed by Holdaway (2017: 601) as the emergence of a 'new, hybrid, loosely coupled system of police regulation'. In this new system, the College of Policing emerged in 2012 as the national body responsible for developing conduct and regulatory frameworks, including fostering a developed sense of 'what works' rooted in evidence. As the then Home Secretary Theresa May claimed:

> The College [of Policing] will work with universities to collect and review evidence on the effectiveness of different strategies and practices for reducing crime. The knowledge of what works – and what doesn't – will be shared with Police and Crime Commissioners and the police, and with the public as well. This will help the police become an organisation where practice is always based on evidence rather than on habit. The answer to the question: 'Why do we do this?' will never be – 'Because we always have done it that way'. It will be 'Because this is what the evidence tells us works best'.
>
> (May 2013)

The 'What works?' movement gained traction with the establishment of the What Works Network in 2013, a Coalition Government initiative now comprising ten What Works Centres responsible for key policy areas, with the mandate of generating, transmitting, and adopting robust research evidence across key public service areas (What Works Network 2014, 2018). Its guiding philosophy is to engage research-based evaluations to inform better decision-making. The What Works Centre for Crime Reduction (WWCCR), hosted by the College of Policing and an allied Academic Consortium,[2] operates within the crime reduction policy area, systematically reviewing evidence on crime reduction interventions, evaluating these interventions (based on cost, quality, context, mechanisms, and implementation problems), and imparting stakeholders with the knowledge to inform resource allocation (Hunter et al. 2017: 1-2).

[2] The Jill Dando Institute for Crime Science at University College London leads the Consortium, and is supported by the Institute of Education, the London School of Hygiene and Tropical Medicine, the University of London, and Cardiff, Dundee, Glasgow, Southampton, and Surrey universities (Hunter et al. 2017: iv).

In the effort to make EBP initiatives a 'professional norm', Hunter et al.'s (2017) review of the WWCCR found support from stakeholders of the affordances of the partnership between practitioners and the academy. Of the stakeholders they studied – chief officers, Police and Crime Commissioners, and Community Safety Partnership managers – there was an implication that this relationship was prompting the adoption of, and adaptation to, research evidence amongst practitioners. The primary challenges facing practitioners, however, were *lack of time* to keep up to date with the evidence base and the perception that evidence lacked *local relevance*. Better managing police time is beyond of the scope of this project, but it can make inroads into making drone evidence locally relevant through a realistic evaluation-style ethnographic research study of drone policing within a *particular local context*.

The WWCCR and the College of Policing are closely associated with 'experimental' and 'evidence-based' criminology (Sherman 2013), which maintain two methodological commitments to conducting evaluations in the area of criminal justice. The first commitment is to experimental methods, and most prominently randomised control trials (RCTs), which follow a control-based approach to measuring the effects of a 'treatment'. Experimental methods are deemed preferable over non-experimental methods due to their ability to control for bias through the scientific testing of a programme as it is implemented in one group and not another (Pawson and Tilley 1994; Weisburd 2003). Consequent findings therefore produce a measure of the impact of the programme, and policymakers and practitioners can each allocate resources based on sound scientific knowledge. Indeed, Weisburd's 'imperative' for RCTs argues that '[RCTs] are thus the most powerful tool that crime and justice evaluators have for making valid conclusions about whether programmes or treatments are effective' (2003: 338), and failure to implement RCTs in favour of nonexperimental evaluations, where the former would be most appropriate 'represents a serious violation of professional [research] norms' (2003: 339).

The second methodological commitment of EBP is to systematic reviews, associated with the international research efforts of the Campbell Collaboration (see Farrington and Petrosino 2001), which synthesise and appraise evidence from prior evaluations (Farrington and Welsh 2007: 98). These studies are assessed according to the Maryland Scale of Scientific Methods, which determines, in order of significance, 'what works', 'what's promising', and what might hold 'possible impact' (Lumsden and Goode 2016: 816). The College of Policing adopts systematic reviews as the 'gold

standard' for developing the evidence-base, which similarly coincides with the effects of austerity and the 're-professionalisation' process discussed previously (Holdaway 2017), as these promote a clear hierarchy of what constitutes 'good evidence' founded in principles of scientific rigour and objectivity, replete with the cost-savings enabled by evidence which instructs the how to allocate resources to achieve desired outcomes.

Reconciling 'research' and 'evaluation'

Lincoln and Guba (1986) are proponents of discriminating between 'evaluation' and 'research' as distinct modes of inquiry: *research* is inquiry for the development of theoretical knowledge about a problem whereas *evaluation* is inquiry aimed at improving or assessing the impact of an evaluand (the referent being evaluated). Shaw (1999) challenges this dichotomy on several grounds. First, the distinction between theoretical and practical/evaluation knowledge is not clearly developed. Theoretical knowledge can play an important role in informing decision-making or organisational learning for practitioners (Weiss 1998) as, for example, Pawson and Tilley (1997) posit in their theoretically driven model of realistic evaluation. Second, research is assumed by Lincoln and Guba to be the reserve of a largely homogenous academic audience whereas evaluation is aimed at incorporating wider practitioner audiences and stakeholders (*not* academic being the key point here). This oversimplification of audiences is unhelpful and presumptuous of siloed work which operates rhetorically, rather than practically (Shaw 1999: 11). Shaw therefore sees no issue with such an enterprise as 'evaluation research' that can cut across these audiences and informants and serve the dual purposes of programme evaluation and the development of theoretical knowledge, as these are not mutually exclusive. The primary aim of this study, to reiterate and develop further, was the development of theoretical knowledge through a qualitative case study. This aim connects with one of the purposes of evaluation research identified by Weiss (1998) as 'organisational learning' (as opposed to evaluation for decision-making, or as a formative or summative exercise). This organisational learning, it is argued here, can occur at the individual case study force level and attempts were made at identifying continuities and discontinuities with other forces nationally through supplementary documentary analysis. Given HM Inspectorate of Constabulary and Fire & Rescue Services' (HMICFRS 2017) conclusion on the absence of meticulous evaluations of police drones, the need for evaluation research in this area gathers momentum. Finally, the compatibility of

evaluation and research sets a precedent for this study to simultaneously contribute to the academic study of policing.

But on a critical realist account, research develops only an approximation of objective reality which speaks to the fallibility of knowledge and claims to it (Danermark et al. 2002). This fallibility is important to recognise not as a limitation of research but as an intractable component of it. Therefore, the task was to determine knowledge which is 'practically adequate' (Sayer 2000, 2010). To be 'practically adequate', or to 'grasp the differentiations of the world … of individuating objects, and of characterizing their attributes and relationships', knowledge must shuttle between the 'abstract' and the 'concrete' (Sayer 2010: 86). Abstraction is a process for separating out aspects of a concrete phenomenon (those occurring in the *actual* domain), for concrete phenomena are constituted by various social and structural elements (Danermark et al. 2002: 42). The starting point for this research was with the concrete phenomenon of drone policing, and the previous chapter sought to separate out those abstract concepts which have been assessed to potentially have significant effects, and thus inform the research design. Hence, knowledge gained about drone policing through the course of the present study is 'practically adequate' insofar as it individuates and maps the relations between drones and policing due to its presentation as a socio-technical system; the study moves from the concrete to the abstract, and will later switch the analytical focus by moving from the abstract to the concrete using critical realist modes of inference and analysis – abduction, retroduction, and counterfactual thinking.

A common criticism of case study is that it does not enable generalisations of the kind propounded by those working within the positivist and experimentalist paradigm (Lincoln and Guba 2000; Tilley 2009). Case studies are, by definition, context-specific and focussed upon generating local knowledge, which neatly fits with the evaluation aim of organisational learning (if the organisation is construed as local and bounded, as was the case here). The language of generalisation (establishing law-like regularities applicable to larger populations) is not conducive to a realistic evaluation of police drone practices for the simple reason that generalisation, in this sense, was not the aim. This study therefore adopted Yin's (2014: 41) 'analytic generalisation' which emphasises the capacity for case study to generalise to other concrete, empirical situations based on the analysis, adaptation, corroboration, or even rejection of the initial propositions offered in Chapter 2. Furthermore, given its

evaluative purpose, there was a 'logic of use' inherent to the data analysis so that the characteristics of case study – holistic, qualitative, longitudinal, and particularistic – would hold relevance for the police as potential users of the research (Wilson 1979).

3.3 Reimagining the evidence base

It is not the aim here to discredit experimental criminology but rather to promote an alternative strategy for understanding the emergence of drone policing in a case study context. As the prior discussions on task-technology fit and political theories established, technologies do not just 'emerge' but are instead enrolled into particular networks of social organisation and practice. Understanding the 'social life' of technology (Ackroyd et al. 1992) therefore necessitates an evaluation attuned to these networks, and qualitative case study is apt for this.

The preponderance toward experimental methods has been observed by Loader and Sparks (2011) as a 'cooling device' – a means to insulate criminological research (and researchers) from the heated discourses surrounding crime questions, through recourse to claims of objectivity, rigour, and impartiality. These claims contribute to a criminology (or perhaps a 'Crime Science', as advocated by Weisburd and Neyroud (2011)) which, rather than engaging with policy problems, concerns itself primarily with 'scientific procedures' to producing evidence (Loader and Sparks 2011: 96). In this way, current experimental criminology is method-driven and unlikely to promote *changes* to policy prescriptions, despite Farrington and Welsh's (2007: ix) insistence that high-quality scientific evidence can potentially cut through political rhetoric. Leaving aside Loader and Sparks' (2011) call for a 'public criminology', their criticism of method-driven evaluations has received support.

The drive to police professionalisation coincides with the experimental methodological commitments discussed previously but establishing such a 'hierarchy of evidence' risks undermining researcher–practitioner relationships insofar as they create obstacles to cultivating what Nutley et al. (2003) term 'research in practice'. 'Research in practice' refers to generating evidence in proximity to professional practice; a research agenda which speaks valuably and relevantly to the practice of policing (Lumsden and Goode 2016: 822). Therefore, generating locally relevant evidence means integrating 'on the job' knowledge into academic research, understanding that 'policing' is not a homogenous entity but instead made up of

heterogeneous purposes and practices, values, symbols, and norms. The social sciences are replete with an array of methods which can enable this type of research agenda, and the current evidence-based paradigm 'presents police with only a partial glimpse of the available research that has potential use' (Lumsden and Goode 2016: 824). Further criticisms have been sustained by Holdaway (2016), who called for criminologists to 'temper' the preoccupation with experimentalism through qualitative studies, and Hope and Karstedt (2003: 1) who suggested the 'death of "the social"' in crime prevention. Hope and Karstedt's (2003) 'Tocquevillian' model, alternatively, seeks to imbue crime prevention strategies with an understanding of the social aetiology of crime. Police studies include a rich history of ethnographic research, and the current experimental paradigm risks undoing the lessons learned through this methodological tradition. Therefore, the task now is to seek ways to reinvigorate this style of research, generate evidence which is locally relevant, and attend to the following criticism:

> Born out of a 'methodological fundamentalism' that returns to a much discredited model of empirical inquiry in which 'only randomized experiments produce truth' […] such regulatory activities raise fundamental, philosophical epistemological, political and pedagogical issues for scholarship and freedom of speech in the academy.
>
> (Denzin et al. 2006, cited in Lumsden and Goode 2016: 824)

Towards a realistic evaluation of drone policing

The strength of police–academic collaboration lies in its ability to conduct research from *within* (Innes 2010). Accordingly, and in contrast to the method-driven experimentalism which predominates the 'What works?' paradigm, the case can be made for a more nuanced, locally-relevant study which takes as its focus the interdependencies between police users and drones. It is telling (and problematic) that the recent HM Inspectorate of Constabulary and Fire & Rescue Services report *Planes, drones and helicopters* (HMICFRS 2017: 86) concluded that no 'rigorous evaluation by any force of their use of drones' has taken place. As the limitations of experimental criminology have shown, there is a need for more imaginative ways with which to evaluate policing programmes which move away from the narrow 'what works?' question toward more locally-relevant evaluations which instead ask the realistic

evaluation question 'What works for whom in what circumstances, and how?' (Pawson and Tilley 1997).

The realistic evaluation model, as devised by Pawson and Tilley (1997; see also Pawson and Tilley 1992, 1994; Tilley 1993; Pawson 2006), is a theory-driven strategy for evaluating programmes, defined as the combination of an 'intervention' (in this case, drones) and the wider systems in which they operate (such as the police organisation, the occupational culture, and the narratives which support the efficacy of drones for policing) (Eck 2017). (See Figure 1 below for a depiction of the realistic evaluation cycle used here.) Programme theory, relatedly, refers to the construction of 'a plausible and sensible model of how a public programme is supposed to function' (Dahler-Larsen 2001: 331, citing Bickmann 1987). Programme theory also refers to the assumptions made by stakeholders, such as police drone users and policy-makers, that the intervention will have some effect on outcomes, and it is the purpose of theory-driven evaluation to assess not only what these outcomes are, but also *how* and *why* they come about (Chen 1990).

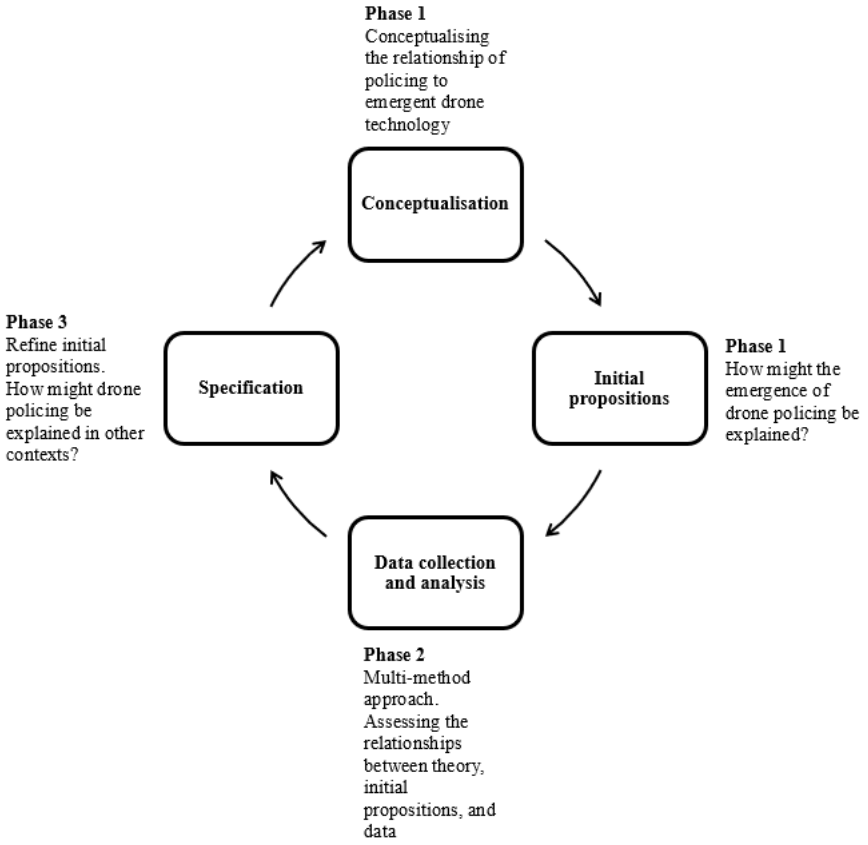

Figure 1. *The realistic evaluation cycle as applied in this study (adapted from Pawson and Tilley 1997: 85)*

Pawson and Tilley (1994), in their polemical paper '*What works in evaluation research?*' took a dim view of the pervasive quasi-experimental control-based approach to evaluation in criminal justice. They concluded:

> It is high time for an end to the domination of the *quasi-experimental* […] model of evaluation. Such an approach is a fine strategy for evaluating the relative performances of washing powders or crop fertilizers, but it is a lousy means of expressing the nature of causality and change going in within social programmes. The pressing need is for the incorporation of a *scientific realist* strategy into evaluation.
>
> (Pawson and Tilley 1994: 292, emphasis original)

Realistic evaluation departs from the wider family of theory-driven evaluation models (see *inter alia* Chen 1990, 2005; Chen and Rossi 1981, 1983) insofar as it is influenced by philosophies of realism, advocated by *inter alia* Bhaskar (1978, 1989, 1998, 2008, 2011). It advocates a view that programmes are socially embedded and belong to open systems (Pawson and Tilley 1997). As socially embedded, programmes are products of social interaction between policymakers and practitioners (as well as the programme's target populations), whereby the programme's success rests upon 'four I's' (Pawson and Tilley 2004: 4):

(i) the *individual capacities* of stakeholders to implement the programme
(ii) the *interpersonal relationships* between stakeholders
(iii) the *institutional* commitment to technological innovation
(iv) the *infra-structural* systems that support or undermine the use of drones.

This then leads to programmes embedding in open systems; unlike the laboratory setting of experiments, social programmes occur in the social world which is inherently permeable and shifting – programmes are thus contingent upon the changing nature of the open system which may hold unanticipated consequences for the programme's effectiveness (Pawson and Tilley 1997: 218). Three principles of realism also inhere within Pawson and Tilley's model. First, realism acknowledges the *real* (Pawson and Tilley 1997: xii-xiii). In the present context drones, the police, and the use of drones in policing are real for they have observable outcomes. Second, evaluation should follow a *realist methodology*; Pawson and Tilley (1997) are

methodological pluralists, suggesting adopting pragmatic methods relevant to the study. Third, evaluation must be *realistic*; evaluations should be context-specific (such as case studies) and should further inform policy thinking on the subject.

Realistic evaluation maintains a critical distance from the simplistic 'what works?' question in favour of the more nuanced 'what works for whom in what circumstances, and how?' (Pawson and Tilley 1997). This relates to the realist formula *context + mechanism = outcome*, which will be expanded upon below. One of the key features of realistic evaluation is its view on causation. Realism rejects the Humean 'successionist logic' of much method-driven evaluation whereby control-based evaluations seek to observe the effects of an intervention by holding constant (controlling for) potential extraneous factors (Pawson and Tilley 1994, 1996, 1997: ch. 2; cf. Bennett 1996). In converse, Pawson and Tilley's (1997) model proposes a theoretically-driven strategy for identifying plausible causal mechanisms which act in contexts to produce outcome patterns, and developing knowledge of the context enables empirical research into the conditions which trigger the mechanisms (Pawson and Tilley 1997). This is termed a 'generative logic' of causation as it is mechanism- and context-oriented (Sayer 2000).

These 'context-mechanism-outcome pattern configurations' (CMOCs) first seek to develop theoretical knowledge about the context in which the intervention emerges. 'Context' here has a dual meaning, referring both to the operational context of drone deployments by the case study Unit pilots and the organisational-cultural-structural conditions which sustain (or hinder) drones as a viable policing tool. This view accords with the prior discussion on the social life of technology (Ackroyd et al. 1992), whereby technologies simultaneously shape and are shaped by the values, beliefs, ideas, and norms which constitute the police occupational culture. Context is crucial to evaluating policing interventions; as the pitfalls in experiments and systematic reviews showed previously, for an intervention to be evaluated properly it must show the conditions which triggered the mechanisms which made it work (or not). Failing to construct a sensible programme theory (here, a plausible theory of drone policing and its contents) also fails to justify the intervention and its causal effects on outcomes, as well as obscure instances of *implementation failure* which may be related to the contextual conditions of the intervention (Dahler-Larsen 2001).

'Mechanisms' are therefore triggered in contexts, and these are *explanatory tools for understanding why the intervention works (or does not)*. Mechanisms can be

identified as: (i) making sense in the context in which interventions are embedded; (ii) enabling propositions of how both micro and macro processes produce the intervention; and (iii) understanding how outcomes are produced from the *choices* stakeholders make and the *resources* they can muster to enact the intervention (Pawson and Tilley 1997: 66). Mechanisms may not always be observable either, meaning what makes programmes 'work' are instead the associated social processes of actors interpreting the programme. The intervention is comprised of the 'package of actions whose effectiveness the evaluation is supposed to determine' (Eck 2017: 562). Drones as an intervention refers to its socio-technical nature, such as: the material object and the human resources required to use the technology; the selection and training of these people to use drones effectively and competently; and the narratives produced by the police which recognise the affordances of drones to their work.

Finally, 'outcomes' are the observable changes in the target of the intervention (Eck 2017). As has been noted previously, drones cut across a range of intervention points for police activities which produce distinct policing tasks (Innes 2014b: 67). These tasks therefore produce a series of practice-based outcomes which can be measured here, such as patrol and response, prevention and protection, and investigation and intelligence (Innes 2014b: 68) which are not strictly limited to just crime reduction but also other policing tasks such as search-and-rescue and community engagement.

3.4 Anticipating challenges

The notion of EBP enjoys broad appeal amongst academics involved with this sort of research; the same cannot be said for practitioners and the intended prime consumers of such research. There remain the knotty problems of getting evidence into practice. The reasons for this are threefold according to Bullock and Tilley (2009):

(i) the nature of evidence about 'what works' can be generated through a range of methodologies – from small-scale studies to systematic reviews and RCTs. Therefore, what can be counted as evidence is debateable;
(ii) Evidence is not always straightforwardly available to practitioners;

(iii)Organisational resistance to EBP research can see evidence superseded by ideas of occupational experience/expertise and discretionary judgement.

One of the central issues identified by Bullock and Tilley (2009) is that EBP is outwardly a sensible endeavour: challenging pre-existing practices and pursuing evidence-based strategies to inform better decision-making to achieve an ostensibly attainable end of 'what works'. Boulton et al. (2021: 1291) suggest that the reasons behind a constabulary engaging with EBP are 'straightforward': EBP approaches can promote integrity in decision-making processes (and may provoke more critical challenges to existing practices) and can manage demands on the service by informing more 'intelligent' strategies and resource allocations. It is important to recognise that the police service is not exceptional in terms of the gulf between evidence-based research and evidence-based practices. Nor is this a parochial concern limited to specific geographic, social, and political contexts. Surveys of police leaders in America (Telep and Winegar 2016) and Australia (Cherney et al. 2019) and front-line practitioners in the UK (Palmer et al. 2019) reported sub-optimal evidence implementation, for instance.

Lag

I propose a fourth possible barrier to getting evidence into practice: lag. One of the central challenges confronting this research was developing a framework for accurately depicting the 'emergent' nature of drone policing. This chimes somewhat with Carrigan and Housley's (2017) discussion on the 'future of social scientific inquiry' and the risks of performing uncritical, unsustainable 'fast scholarship' in an era of technological advancement. *Drone technology* is therefore firstly presented as an emergent problem for inquiry and thus liable to prove challenging to generate and subsequently disseminate timely knowledge about drone policing for the following reasons. Firstly, its potentiality is not yet fully realised. Enticing predictions have been made regarding the societal and economic benefits[3] to a host of sectors and industries. But as Chapter 8 will demonstrate, the prevalence of risk discourse in regulatory frameworks and responses (Ericson and Haggerty 1997) indicates a tension over the

[3] Predicted impacts upon UK GDP include: £16 billion net cost savings, an additional £42 billion, and 600,000 jobs in the drone sector by 2030 (Haylen 2019: 38). Chapter 8 will explore the societal and economic narratives surrounding drone technology further.

need for precaution to limit drone technology's harmful potentials whilst enabling its proliferation to maximise its beneficial potentials (Wallach 2015). Regulation necessarily involves politics, however. How and by which interest groups are beneficial potentials defined before they are realised? What are the consequences (intended or otherwise) of proliferation? It is also widely available, but not an entrenched and commonplace technology (Brey 2017). Drone technology's capabilities are limited to, generally, remote and aerial modes of payload delivery and data collection, and its capacity for impact is therefore limited to those user groups who would most likely benefit from this (see Haylen 2019). It is also controversial. High-profile drone crime 'signal events' (Innes 2014a) such as the shutdown of Gatwick Airport in December 2018 have been accompanied by stronger civil airspace regulations (Department for Transport 2019). In this regard, drone technology is both the subject of regulation and exerts its own regulatory power by generating responses (see Chapter 8; also McGuire 2012). A central challenge for regulators is the effective enforcement of rules governing drone use and public reassurance (House of Lords European Union Committee 2015; Haylen 2019). Critics similarly raise concerns regarding its risks to privacy, public safety, and the accountability of users to legal mechanisms.

Secondly, *drone policing* is an emergent problem for the following reasons. Vast differences in its practice and organisation occur across England and Wales. Devon and Cornwall Police established the first 24/7 dedicated drone unit, whereas others such as Hertfordshire Police share their drone capability with the local Fire and Rescue Service, to provide just two examples. Differences also occur between the equipment and brands used by drone-using forces, costs of procurement and training, and the experiences of its users (see HM Inspectorate of Constabulary and Fire & Rescue Services 2017). Chapter 5 will explore these issues further, but this localism holds consequences for the effective framing of this arguably novel style of policing. Localism disrupts the capacity for inter-force resource sharing, and fragments knowledge about 'what works' as local contexts may be varied. Its regulation is therefore localised. Police drone operators acquire necessary qualifications to fly via the Civil Aviation Authority, but the lack of police-specific regulation is problematic. As a comparison, more entrenched technologies of policing such as Taser are accompanied by national standard operating procedures (e.g. 'Authorised Professional Practice') and legal guidelines. Questions as to 'what works?', formal and voluntary

regulation mechanisms, and the implications of drones within local policing contexts need addressing. Narratives also abound regarding its transformative potentials for policing (see National Police Chiefs' Council website, 2017). In combination with the wider shift toward modernisation and technological literacy (Association of Police and Crime Commissioners and National Police Chiefs' Council 2016; Deloitte 2018), the specific ways in which drones may (or may not) shape police practices require empirical study.

The threat of 'lag' therefore concerns how efficient and timely EBP contributions can be. The 'emergent-ness' of the problem points up significant conceptual and methodological barriers. This study will therefore represent a very specific, temporally-bounded insight into a burgeoning drone programme. In the near future, the nature of drone policing is (I tentatively suggest) liable to change. In the time since commencing this study in 2017 there has already been a rapid expansion in the number of constabularies using drone technology. In another few years, the landscape might be very different to the one presented here. Does this mean that research should not be conducted, out of fear that its findings would soon be obsolete? Theory-driven evaluation such as Pawson and Tilley's (1997) model, coupled with a critical realist philosophy concerned with an 'adaptive theory' (Layder 1998) approach will therefore establish conceptual and empirical footholds for future research to be conducted. The crux of the adaptive approach is that concepts are liable to change, and embracing that change in future research will go some way to remedying the issue of lag: conceptual understandings of drone policing will only gain further specificity.

3.5 Conclusion

Realist evaluation is not without its critics. Davis (2005: 279) challenges the preponderance of 'context' and, in particular, the usage of 'culture' as a valid conceptual device; this inherently complex entity requires operationalisation (or 'dissection') prior to engaging in empirical investigation. Dahler-Larsen (2001) also criticises the boundedness of context-specific evaluation. Furthermore, Pedersen and Rieper (2008) suggest theory-driven evaluation, in the effort to develop middle-range theories and neglecting grand unified theories, has difficulty with large-scale programmes at the policy level. Similarly, the potential for overlap between contexts

and mechanisms (whereby mechanisms might produce new contexts) can confound theory-driven evaluation (Pedersen and Rieper 2008).

The purpose of this chapter was to provide important background context to police research. EBP has placed an emphasis on police researchers to generate knowledge about 'what works'. It conventionally does this through a methodological paradigm committed to scientific 'gold standards'. This study diverges from this; it seeks to raise the profile of small-scale qualitative case study for generating locally-relevant and timely contributions about 'what works' for individual constabularies. Whilst the issue of 'timeliness' has been discussed in relation to 'lag', it is suggested here that this will be a problem which conditions all research on technological innovation. The response is to acknowledge that findings will be artefacts of a particular moment in time; the value can be found in adopting a critical realist philosophy to ensure that findings can serve as useful starting points for subsequent research, which again will contend with the problems of 'emergent-ness' *and so on and so forth*. The findings from this study will be framed in realist terms throughout the thesis and the outcomes of the realistic evaluation will be presented in Chapter 9.

Chapter 4: Case study methodology

4.1 Introduction

Chapter 2 concluded with the initial propositions which guided the research, distilled from the literature which was reviewed in order to propose plausible, theoretical explanations about the relationships between policing and drone technology. In order to explore these relationships, and to corroborate/adapt the initial propositions, a case study methodology was adopted. This chapter provides an overview of the critical realist approach taken within this study and justifies this single case study of drone policing and its units of analysis. In particular, attention is paid to the critical realist influences upon the methodology and its subsequent role in the adaptive strategy which was adopted (introduced in Chapter 2). The chapter moves on to an overview of the observational, interview, and documentary research methods and the accompanying ethical and political consequences of researching a police organisation.

4.2 Ontology and epistemology

A critical realist perspective on the social world was most appropriate to addressing the research question and for refining the initial propositions. Critical realism combines a realist ontology with a constructivist epistemology (Sayer 2000, 2010). Problems exist 'out there' independently of any prior knowledge about them, but any knowledge is situated, constructed, and fallible (Bhaskar 1978; Archer 1995; Danermark et al. 2002). Social research is, therefore, capable of observing reality with 'greater or less accuracy' (Bottoms 2008: 77), though these observations are theory-dependent (Sayer 2010). The theory-dependency of observations leads to a workable middle ground between, in Tilley's (2000: 111) turn of phrase, 'the Scylla of relativism and the Charybdis of absolutism' – objective understandings of reality can be made in studying the fine-grain of social life.

Further to this, ontological concerns regarding the properties of the study's objects of inquiry – drone policing and its contents – which make them knowable in the first instance were addressed (Bhaskar 1978). Chapter 2 has already discussed the ontological properties of drone policing through a conceptualisation of this socio-technical system. It was intended that the preceding conceptualisation represented a more pragmatic means to navigate the relationship between humans and technology

and thus resolved the interminable '*n*-body problem' for which actor-network theory was criticised. Ontological concerns have already therefore been raised above epistemological ones precisely because of the theory-dependency of knowledge and the interest in understanding *how and why drone policing is made possible* through the interactions between mechanisms and contexts (cf. Bhaskar (1978) on the 'epistemic fallacy' and Lincoln et al. (2018: 136) on the 'ontological/epistemological collapse'). The implications of this for critical realist qualitative research were then considered. Maxwell (2012) makes the case for the blended realist ontology/constructivist epistemology because whilst meanings and interactions might be socially mediated, they nonetheless hold real and causal consequences. This point chimes with Stanley's (1990: 622) critique of ethnographic description: 'literal description can never be complete and could always be other while remaining description of "the same thing"'. Prioritising the ontological over the epistemological therefore moved the study beyond concerns with relativity, the situatedness of knowledge, and the interpretive process. Instead, the study could enjoy a more practical scope[4] and could more usefully intervene in broader political questions surrounding drone policing as an exercise in 'evaluation research' (see Shaw 1999; also Pawson and Tilley (1997: ch. 1) for a sustained critique of social constructivism and its role within evaluation).

The final philosophical issue to be addressed hinged on the critical realist presupposition about the nature of reality which is stratified across three overlapping domains: the real, the actual, and the empirical (Bhaskar 1978). In relation to the question about the possibility of drone policing, the stratification of reality implied that observations were to be made of events in the 'empirical' domain. In turn, these observations could provide context and substance to the mechanisms which produced the events, reflecting the 'actual' domain. Eventually, analytical conclusions could be drawn within the 'real' domain about the mechanisms, enabling explanation about causal properties and powers which usefully explain the emergence of drone policing. Furthermore, as Sayer (2000: 12) suggests, observability does not equate with existence and vice versa, i.e. a mechanism might produce an unanticipated event, or some other previously unconsidered mechanism might be at work. Therefore, explanation within the 'real' domain could enable explanations about how drone

[4] One uninhibited by constructivist pre-occupations with epistemic processes.

policing has been causally generated *but also* enable speculation about how drone policing might not be generated under different circumstances or how rival mechanisms might be at work.

4.3 The case

Research on causation previously belonged to the quantitative paradigm; only through careful manipulation and control of variables were mechanisms believed to be identifiable and their results empirically knowable (Bottoms 2008). Such a view has been addressed in Chapter 3 regarding the problematic faith placed in randomised control trials and quasi-experimental methods as the 'gold standard' for 'what works?' research (Holdaway 2017). As the case has been made, this study's use of Pawson and Tilley's (1997) realistic model implies a specific focus on the socially mediated practices of drone policing. Accordingly, this study was designed with the express purpose of clearly defining the 'case' (drone policing) and its parameters (otherwise termed 'setting' or 'field' (see Hammersley and Atkinson 2007: 31)) for the purposes of qualitative case study evaluation research. Furthermore, the case study force and the users of drones within the Operational Support Unit served principally as a *critical case*[5] for the purposes of theory generation about drone policing (see Yin 2014: 51). Similarly, the Unit also served as a (relatively) *unique case* insofar as drone innovation remains at the time of writing unevenly distributed amongst constabularies in England and Wales (to be explored further in Chapter 5, see also Chapter 1). Far from being routinely deployed in British policing, the insights afforded through the Unit's adoption and implementation of this specific device shed light on significant nascent processes. In terms of evaluation research purpose, these insights may hold considerable value to both academics and practitioners alike as the future of British policing continues to orient towards emergent technologies such as drones.

The most important statement regarding the value of case studies for evaluation research was made by Donald Campbell in establishing that qualitative case studies are adept at identifying and understanding causal mechanisms (Shadish et al. 1991: 135). Discussing Miles and Huberman, Shaw (1999: 130) similarly criticises

[5] 'Critical' because the case is integral to examining the proposed relationships between policing and emergent drone technology within a specific context. Yin (2014: 51) defines critical cases to 'be critical to your theory or theoretical propositions […] The theory should have specified a clear set of circumstances within which its propositions are believed to be true'.

the erroneous assumption that only quantitative research can yield answers to causal questions; qualitative research is thus qualified to identify causal mechanisms, work through complex social arrangements, and shuttle between different units and levels of analysis through prolonged naturalistic exposure to the field. The logic underpinning this case study followed Yin's (2014) seminal text on case study research, with important contributions made by critical realists such as Layder (1993), Danermark et al. (2002), and Sayer (2010) woven into its design.

Units of analysis

The research focus on the changing nature of operational support policing within one police force warranted a single embedded case study design. An upshot of police research is that the parameters of the study can be clearly identified, given the specific institutional 'boundedness' of each constabulary which comprises the system in England and Wales. Features relevant to the analysis of policing practices and organisation as they revolve around drones, such as the implementation of supporting infrastructure, acquisition of drone resources, and operational drone deployments, were therefore bounded to this force specifically. The selected force was germane to the study's aim of generating theoretical knowledge about drone policing for several reasons. Firstly, due to its position as a relatively early adopter of drone technology in England and Wales its drone programme was expected to be further developed if compared to other fledgling programmes elsewhere. This position was critical due to the uneven distribution of drone programmes across England and Wales, the minimal intervention by supra-force and governmental institutions in directing drone adoption nationally, and the vast degrees of flexibility local forces enjoy in managing their own drone programmes (see HMICFRS 2017: 4; Haylen 2019). Secondly, the force area covered a combination of urban and rural landscapes. It was supposed that a diverse operating environment would lead to an assortment of drone deployments, outcomes, challenges, and opportunities. It was also anticipated that an urban-rural divide might emerge, perhaps between the occupational-cultural outlooks of officers and the meanings which were assigned to the drone programme across different organisational settings (see e.g. Cain 1973).

The position as early adopter was however seen as the key significant point for analysis. The force had amassed around three years' worth of experience using drone technology prior to the study's commencement; 'teething problems' are common

following the introduction of new processes and technologies, so this time provided an opportunity for the force to acknowledge any challenges and act upon these. In this way, it could be suggested that drones were moving from an 'emergent' device towards becoming 'entrenched' (Brey 2017) by the time this study started. The small number of pilots trained at the start of the programme had had time to learn the technology, complete qualifications, and to begin to form a unique sub-culture oriented around the drone, which stressed the importance of pilot initiative, learning, and reflection.[6]

The observational fieldwork and interviews were conducted within one specific department of the case study force: an Operational Support Unit providing force-wide coverage for a range of tasks. Operational Support Units are commonplace organisational designations amongst many forces in England and Wales, in effect delineating more specialised functions from the routine tasks performed by local/neighbourhood, 'Division' units. The Unit was described by one member during interview as an amalgamation of various specialist capabilities with Unit officers being *"trained in a whole host of different things with a view of having it all under one roof, to have one department to go to for whatever you need".* Another viewed the Unit as assisting *"local units with regards to high level crime, travelling criminals and anything which local units aren't able to assist with"*. Until a force-wide restructuring initiative several years prior, the Unit was designated as a Roads Policing Unit and most of the Unit's officers retained a strong occupational affinity for fast cars. The reorganisation into the Operational Support Unit resulted in these same officers broadening their portfolios, taking on new responsibilities in largely reactive and responsive measures and being trained up on sophisticated technological apparatus. The Unit was responsible for:

- Taser
- Roads policing (including vehicle response and pursuit, automatic number plate recognition, and serious road traffic collisions)
- Advanced method of entry
- Search

[6] These sub-cultural aspects represent a significant departure from common analyses of police culture. The Police Foundation and KPMG (2018) discuss in their report that aviation culture is built around institutionalised learning following a failure, and highlights avenues to implement this in policing, which is characterised by 'blame' in the event of a failure.

- Public order and Police Support Unit.

More recently the Unit adopted a drone capability and the research took place at a significant junction in this programme: 'proof of concept' drones had been previously deployed and their uses evaluated and the Unit was moving into what will later be described as the 'going live' phase. This new phase involved the acquisition of two bespoke drone models to replace the previous 'concept' drones which were off-the-shelf commercial equipment. The new bespoke drones were designed by a UK-based tech design and manufacturing company and a working relationship between supplier and user flourished. Officers on the drone programme were able to contribute to the design process and recommend certain ergonomic and practical design choices, from an all-weather carry case containing the drone and spare batteries to waterproofing the controller and simplifying its interface to be more user-friendly during live operational deployments. This led to the drone equipment being 'police proofed' by design: rugged enough to withstand the rigors of police work in unforgiving weather conditions or uncertain operational environments and to streamline the technical controls.

Research map

The case study force was institutionally bounded insofar as it exhibits: a jurisdiction (area of operation); nationally and locally mandated responsibilities in crime prevention and so on; and a clear division of labour identifiable through its hierarchical and bureaucratic organisation. Of course, this recognises that the force's responsibilities are to a degree diffused across the extended 'police family',[7] but regardless, it is relatively clear that the contours of the force are mappable. In terms of identifying the multiple units of analysis, it is pertinent to turn to Layder's (1993, 1998) 'research map' which identifies distinct units of analysis ranging from the macro to the micro levels:

[7] For instance, the force: is committed to the national Strategic Policing Requirement; must deliver against the local Police and Crime Commissioners' Police and Crime Plan; incorporates national strategies laid out in the *Policing Vision 2025* regarding accountability and partnership working; offers drone capabilities to the local Fire and Rescue Service; shares information with local and national non-police and supra-police agencies; and so on.

Unit 1: Macro social organisation

The geographic force area covers both rural areas and a small number of urban centres, as well as stretches of coastline and a border region across approximately 1,500 km^2 and is home to approximately 600,000 residents. Its rural areas include tracts of farmland, mountains, valleys, nature reserves, and historical points of interest. The largest urban centre is host to government buildings, several universities and higher education facilities, and is well-connected by road and rail transport links. Key thoroughfares bisect the force area, including significant motorways which connect the area with neighbouring cities and further afield. The force, at the time of the study, employed approximately 1,200 sworn officers, 530 support staff, 130 Community Support Officers, and 90 Special Constables. These personnel were organised into local policing area teams, established in recent years as part of a force restructuring initiative, which are each headed up by a superintendent-led management team. Local policing area teams comprise neighbourhood police teams, criminal investigation, and operational support units.

The macro organisational features of the case study force provide specific contextual details for the purposes of a realistic evaluation (Pawson and Tilley 1997). For example, the force area which covers a combination of urban and rural spaces, along with the key thoroughfares which present policing challenges in the form of vehicle-borne criminality, presents a variety of geographic contexts within which drones might be deployed. In this way, CMOCs can be tailored to suit multiple geographic and crime-type contexts.

Unit 2: Intermediate social organisation

This second unit of analysis refers explicitly to the specific settings across which the study was conducted. The establishment of the Operational Support Unit in recent years had concentrated specialist support functions within a small number of stations, and a comparatively small number of multi-skilled officers. The force restructuring sought to house operational support functions within a specific unit spread across the force area. These operational support functions include Taser, method of entry, public support units, roads policing (advanced driving), and now drones. Unit officers were multi-skilled insofar as they are trained in the use of a number of these specialisms, pointing to the need to keep resources slack so as to make these available across the force when needed.

Unit 3: Social activity

The tertiary unit of analysis was concerned with the quotidian dimensions of policing, workaday routines, and interactions between members. Observational fieldwork was most appropriate to capturing these activities, and the level of access enjoyed throughout the study enabled insights into a broad cross-section of police activity. Between pilot training, live deployments, and time spent in the station with the officers, insight was granted into the social organisation and practices of operational support policing as presented by its members. Most importantly, the social activity of drones was examined, adding credence to both Lawson's (2010) contribution to extension theory (extension as enrolment of technologies into social behaviours) and Goodhue and Thompson's (1995) task-technology fit theory. How pilots were perceived by non-pilots, how non-pilots requested drone assistance, the values pilots placed on drones to their work, and how the pilots navigated the relationships within the wider Unit were all subject to analysis.

Unit 4: Self-identity and individual social experiences

The final unit of analysis was concerned with the individualised experiences of firstly being a police officer and secondly of being a drone pilot. Due to the amount of time officers spent away from the station (and therefore away from colleagues) during their workaday business, I spent considerable one-on-one time with informants. Layder (1993: 72) discusses self-identity in terms of a 'psychobiography', or an informant's life history. This biographical approach was pursued through exploring the meanings informants attached to their work and, subsequently, their views on drones. Were drones useful? Could they recall a particularly successful deployment? Have they experienced any technical challenges? These were all questions put to informants at various times to elucidate the individualised meanings they attached to drones. By and large responses were similar, but points of comparison emerged as pilots gained more flight experience in a variety of deployments. Furthermore, this unit of analysis attuned itself to the 'show and tell' culture discussed by Shearing and Ericson (1991), whereby informants communicated their thoughts not only through discussion but also by demonstration. These questions asked were sometimes answered by a live demonstration of the drone, with the pilot talking me through how the drone flies, the benefits and limitations it presented in a given situation, and the opportunity for myself to see the process in action.

4.4 Methods

Critical realism stands against 'methodolatry' (Pawson and Tilley 1997) and methodological monism (Shaw 1999) in favour of pragmatism and pluralism. Therefore, a multi-method approach was devised and carried out:

Observations collected primary data on the operations of drones within the case study force, involving sixteen months of access negotiations and integration with the work routines of informants involved in the drone programme and those on the Unit more generally.

Eight semi-structured interviews were conducted at various stages during the study's lifecycle, ranging from the preliminary 'conversations with a purpose' (Burgess 1984) to elicit the primary orienting concepts to more formal explorations of force-wide strategic plans and technological developments. Interviewees were those involved with the drone programme (two managers, four pilots) and two senior force operational leads. Further 'ethnographic interviews' were conducted in situ to gather further interview data as a matter of pragmatic necessity. 'Ethnographic interviews' refer to the informal conversations which were held throughout the observational period. Due to the length of time spent in the field and the number of officers with whom I had contact both within and without the Unit, it is difficult to provide an accurate number of people with whom I conversed. Some conversations were however more appropriate sources of data than others because not all were strictly germane to the study of drone policing (given cops' tendencies toward casual conversation).

Documentary analysis of a set of documents produced by the case study force relating to their drone acquisition and operational and strategic plans, through to various memoranda of understandings, national-level and force-wide strategic documents, and other stakeholder documents (to be discussed below). Qualitative data were initially entered into the qualitative data analysis computer software package, NVivo. Subsequently, these documentary sources were analysed manually for reasons to be explored below. Combined, these methods enabled a degree of triangulation (Hammersley and Atkinson 2007) in order to interrogate the reliability of empirical findings from the field and elsewhere, and to augment potential gaps in my knowledge. (See Appendix A for a full list of documentary analysis sources.)

Observations

The primary data collection method employed was observations of drone pilots during training, on operational deployments, and as they conducted routine business not necessarily associated with drones. The observations were carried out between October 2018 and February 2020 and took place across the force geographic area and in a range of operational and non-operational situations (such as the Unit's stations and training exercises). Records of how many hours spent in the field were not kept because I would pivot between accompanying informants for the duration of a shift (7-8 hours) or would be called in to observe a particular training event or pre-planned deployment. The most intensive periods of fieldwork involved several shifts per week for several weeks at a time, and I would use the time when informants were on leave or otherwise absent due to other commitments to write-up and analyse data. This study reflects many of the elements of *organisational ethnography*, a type of ethnographic research which focusses primarily upon bounded institutions and the routine behaviours and activities which comprise the work its members do in furtherance of the institution's goals (see Neyland 2008). Much like 'ethnography' more generally speaking, organisational studies are concerned with the minutiae of organisational activities as key data sources for unravelling the connections between organisational members, working routines, and continuities and discontinuities between behaviour and policy directives (see Manning 2008: 288; Watson 2012). This quotidian focus gains traction on a realist account; as Van Maanen (2011: 49-51) suggests, extensive description from the native's point of view, embellished with 'setting-specific' cultural symbols and language, renders the realist account faithful to informants and the setting. The value of indigenous meanings for evaluation research is paramount, and my task was to interpret these meanings through close association with the occupational culture and render them interesting and useful to wider audiences (Wilson 1979).

Doing realist ethnography

For Van Maanen (2011: 45), realist ethnography is a 'dispassionate' and 'third-person' account, reliant upon in-depth description and explanation of observations from the field to promote its credentials of authenticity. For the researcher, a degree of *experiential authority* is assumed through the relegation of their voice (noted as an 'absence' from the written account) and the bringing into analytical focus the findings,

as presented by informants, which relate to the research problem; the realist ethnographer thus assumes an 'institutional voice' – a 'studied neutrality' – in the quest for 'telling it like it is' (Van Maanen 2011: 46-48). This dispassionate approach to realist ethnography serves the vital purpose of mitigating the risk of 'going native', with the researcher only making 'cameo' appearances in the fieldnotes and the voices and behaviours of informants given primacy. The risk of 'going native' is a considerable one in the context of participant observation, and raises challenges to the researcher in terms of the legitimacy of claims, potential biases in data analysis and presentation, and in the critical distance one can maintain from the field and informants. To remedy this, I strived to 'go academic', as Hobbs (1988: 15) reflected upon during his seminal research into East London detectives; the writing up of fieldnotes *ex post facto* enabled a degree of critical distance to be cultivated between the observational experiences and the task of data analysis.

Van Maanen (2011: 48) also identifies the process of *typification* as emblematic of realist ethnography; the focus on the minutiae of everyday life and the routine behaviours of informants are all valuable data for the purposes of developing understandings of typical forms. This runs the risk of inappropriately forcing data to fit theory, and vice-versa, as the researcher flattens out individual experiences in favour of establishing (however tangential) their relation to pre-ordained orienting concepts. To remedy this risk, Layder's (1998) advice on orienting concepts being provisional means for organising data was followed which enabled their inherent disorderliness to shape the data collection and analysis stages. Rather than forcing data to fit concepts, concepts were developed or dismissed in the light of the data, thus enabling a process akin to 'theory adjudication' and the analytical strategies discussed previously.

Observational fieldnotes were a critical instrument for research purposes and were undertaken in a number of ways dependent upon circumstances. Generally, I was always able to freely take notes in a small notebook I kept on my person. I was able to jot down key interactions, draw flowcharts of organisational processes, or describe important features about a specific operational context. At other times, I was required to be more inconspicuous and therefore make 'mental notes' of ideas and observations to record later. Fieldnotes in the form of jottings were subsequently written up into long-form accounts as soon as practically possible after the observations. As previously discussed, the fieldnotes began to take the form of constructed narrative

accounts, produced by the researcher whilst remaining sensitive to emic symbols. Fieldnotes therefore were interspersed with indigenous slang and turns-of-phrase; a slew of abbreviations and acronyms; as well as helpful theoretical points to be elaborated in the writing up and analysis phases. A series of memos were written in conjunction with the long-form fieldnotes which explained and/or elaborated upon the connections being made between data segments (Lofland and Lofland 1995: 193). These memos were critical not only for making sense of the interconnections between data segments, but also as exercises for etic, or theoretical, discussion. Furthermore, they also acted as 'confessional tales' (Van Maanen 2011); insights into my personal thoughts and ideas on the research as it progressed. These confessionals shone light upon the research's challenges and the thought processes informing certain decisions, intending to contribute added authenticity to the ensuing data presentations. I later learned that this act of memo-keeping was akin to 'marginalia' which is emerging as a subject of sociological interest in extraneous or data 'by-products' produced during the course of conventional data collection techniques (see Muddiman et al. 2019). These observational data were initially compiled into NVivo software; however, in the interests of becoming more familiar with the data and to not 'flatten' out the data a manual coding technique was instead adopted. This manual coding strategy involved colour-coding, highlighting, making notes, and generally familiarising myself with the hard-copy data, linking to other hard-copy data segments (whether generated via previous observations, interviews, or document analysis) where relevant. I would then file these appropriately before typing up these segments and bringing these together to begin holistic analysis. As this process was ongoing during the fieldwork period, I would continuously revisit previous data/coding and make alterations or combine new information with previous where necessary.

Early in the research, and especially during access negotiations, the decision was taken to adopt a *nonparticipant observation* stance. At first reading, this may appear counterintuitive to the well-worn ethnographic tradition of participant immersion in the police context (see *inter alia* Banton 1964; Holdaway 1983; Hobbs 1988). The value of participant observation is that the researcher can get closer to research informants, understand the inner workings of the setting as it is understood and produced by informants, and to generally promote stronger relations and rapport (Hammersley and Atkinson 2007). Geertz's (1973) seminal work on 'thick descriptions', for example, relies upon the fully-immersed participant observer to

produce these. Within police research, there has also been a strong commitment to participant observations. Hobbs (1988: 6), for example, recalls sometimes forgetting that he was doing research at all – 'I spoke, acted, drank, and generally behaved as though I was not doing research'. Norris (1993) also immersed himself as a participant in the world of detectives, adopting their style of dress, being introduced (problematically, he notes) as a 'colleague', and even by being spotted driving a police car during an incident. Holdaway (1983) conducted participant observation of a different stripe – his covert observations as a serving police officer/academic yielded significant contributions to the field but left him with a constant sense of unease of being found out. Holdaway (1983: 9) criticises Gold's seminal conceptualisation of the continuum between observation and participation by suggesting his role was a 'triadic balancing' of personal ethics, his duties as a police officer, and the research's aims.

Gold's continuum, or typology, of social research identifies four key approaches to observation and participation: complete participant; participant as observer; observer as participant; and complete observer. But, as Holdaway (1983) notes, this continuum is too restrictive and fails, as O'Connell Davidson and Layder (1994: 169) suggest, to appreciate the researcher role as being in a constant state of flux and negotiation. A more pressing consideration during the early stages of this study was the cultivation of a certain field 'persona'. Much like Hammersley and Atkinson (2007) suggest 'impression management' as integral to navigating the field effectively, promoting rapport, and avoiding suspicion, care was taken to cultivate a sense of working identity which would not undermine the study.

The decision to adopt a nonparticipant observation stance is, it is argued here, not comparable to the role of 'complete observer'. Complete observation approaches engage obvious concerns over researcher bias due to their inability to interpret findings 'from within' (O'Connell Davidson and Layder 1994) and conjure images of the sterile experimentalism of social research which the previous chapter criticised. Nonparticipant observation, conversely, does not necessarily imply the same level of bias within police research. Fundamentally, and perhaps contrary to the experiences of foregoing police ethnographers, the present researcher is not, and cannot be, a 'participant' in the conventional sense. The 'office of constable', which Johnston (1988: 52) identifies as the defining characteristic of the police, represents an immutable and incontrovertible fact. Thus, any research conducted by an outsider to

the police is definitionally 'nonparticipant'; however, this does not preclude the researcher from 'participating' in a looser sense with the activities of the police that go beyond the discharge of their official duties.

Semi-structured interviews

The primary aim of conducting semi-structured interviews, especially those held at the beginning of the study period (between October 2018 and January 2019), was to elicit preliminary data in order to develop the orienting concepts required for later data analysis. These first interviews, similar in style to 'conversations with a purpose' (Burgess 1984), were designed with the express purpose of eliciting frames of reference from knowledgeable informants. In line with the emic analytical strategy discussed previously, the outcome of the preliminary interviews was to frame the research problems in the specific cultural and organisational symbols of the informants and, ultimately, the potential users of the research. Similarly, this process also involved a degree of etic interpretation: the matching up of emic symbols to prior theoretical knowledge, so that both researcher and informant knowledges spoke to one another via the double hermeneutic.

Furthermore, there was a distinct *evaluative purpose* contained within the design of the interviews, tailored to each of the interviewees' unique roles and responsibilities within the force and within the drone programme. Interviewing for evaluation research bears many similarities to interviewing for other (non-evaluative) social scientific purposes: the interviews here were acknowledged as moments for narrative formation, co-produced between interviewer and interviewee; as opportunities for interviewees to share experiences and stories;[8] and as ways of narrowing down the analytical focus of the ensuing study (see King 1994; Brinkmann and Kvale 2015). These preliminary interviews also took on a distinct evaluative purpose of their own. One of the advantages of interviewing in organisational contexts is that questions can be focussed upon, or responses elicited about, specific organisational processes and life (King 1994: 33). The devising of an interview schedule prior to each interview therefore facilitated this process. Some preliminary

[8] Storytelling amongst police occupational members has been acknowledged by Shearing and Ericson (1991) as a distinct mode of cultural identity formation. The oral tradition of policing was capitalised upon during the interviews; given the semi-structured nature of the schedules, interviewees were encouraged to elaborate beyond the strictures imposed by the questions. In these 'detours', significant stories were told that might otherwise have gone unspoken had the interview been fully structured.

background research was conducted on the roles occupied by interviewees (such as the responsibilities of their post) to tailor questions to be more specific, build rapport, and ensure data yielded would be as relevant and interesting as possible. Moreover, the theoretical concepts which emerged during the course of the literature review enabled significant preparation with regards to how to phrase questions and to focus down broad theoretical concepts into issues which interviewees would relate to. This double hermeneutic consisted of translating theoretical concepts (such as innovation cycles, task-technology fit, and cultures of technological use) into questions to which the interviewee could feasibly respond given their role within the force. Interview schedules therefore differed according to the interviewee, because each interview was specific to the experiences and knowledges held by interviewees but were united in common purpose of eliciting individual narratives about key issues at hand.

A total of eight interviews were conducted. Two of the interviewees were 'programme managers' and had been involved in the development of the drone programme since its earliest inception. One of these managers also regularly operated drones and eventually became the key gatekeeper. A further four interviews were conducted with drone pilots who had been involved with the programme to varying degrees. At the time of the interviews, two had only recently completed the qualification for piloting drones and had yet to fly operationally. These same interviewees were later observed as they gained experienced with the drone technology in an operational capacity. The other two pilots already held operational experience of drone flying. The remaining interviewees were, respectively, a senior force operational lead with experience of managing operational technologies and a senior officer attached to the force's innovation programme based at Headquarters.

Interviews were audio-recorded and transcribed by myself and participants were provided with materials prior to participation in line with ethical requirements (see below). Interviews were carried out in private – usually an empty office, but one was carried out in a quiet corner of a Headquarters canteen before the lunchtime rush – and we were given privacy by other officers to the extent that we were not disturbed during the interview. However, some interviews were interrupted by radio calls – when this happened, the audio-recording was paused so that my recordings did not potentially capture sensitive or operational information.

Requests for additional interviews were made at several points during the study; however, officer unavailability and lack of interest in participating in this way

limited further interviews. Ethnographic interviews were therefore pursued in order to overcome these limitations which bore similarity to the semi-structured interview protocol.

Documentary analysis

As segments of primary data connected to others in an emergent formation of an emic narrative structure, so too did these data begin to display connections with secondary documents in the public domain. In particular, what became interesting were the connections between policy principles and practices on the ground, as observed during fieldwork. Documents were therefore far more 'fluid' in their intended objective when read in the context of operational policing, highlighting subtle differences between policy and action (Manning 2008: 288).

There was a wealth of documents available for analysis (see Appendix A for a full list of the documentary sources which were analysed). As the study progressed, I was also signposted to other relevant documents by informants, and due to the rapidly evolving pace of drone regulation and adoption, a number of new publications became available (especially at the government level). There was therefore a need to discriminate between documentary sources, and so a stringent sampling mechanism was adopted. Documents were first coded according to the level at which they were produced, e.g. national and regulatory in scope or local force operational and strategic plans. Secondly, documents were read and coded in a similar manner to the fieldnotes (see above). This allowed for a continuity across data analysis, regardless of source.

Once the sampling frame was determined and the analytical utility of the document assessed, these documents were then analysed in accordance with the ethnographic analytical commitments to *emergence* and *reflexivity* (Altheide 1987). Emergence in this sense refers to the manner in which themes emerged from the data which either supported, refuted, or subtly redirected the preliminary coding schemes. Reflexivity related to the ability to analyse documents as they interacted with other aspects of the study. These were not viewed as static, but rather vehicles for interpreting primary data in the context of legislative or more formal texts, and vice versa. The value of the adaptive theory approach was that documents served as useful sources of verification for fieldwork observations, otherwise termed 'triangulation' (Hammersley and Atkinson 2007).

4.5 Inference and analysis

Linking data to propositions is an analytical procedure; a process of organising data to reflect the study's propositions (Yin 2014: 36). The data were organised using Layder's (1998) principle of 'orienting concepts'. Orienting concepts are provisional means through which patterns of meaning can be identified in data; in this way, the study partially utilised inductive theorisation where necessary. These key terms subsequently oriented analytical attention to their recurrence or desistance in subsequent interviews and observations; the frequency with which such concepts appeared (and the surrounding context) provided some indication as to their importance to informants and therefore the study. Orienting concepts depart from the conventions of 'sensitising concepts' deployed by Blumer (1954) insofar as the former, according to Layder (1998: 110), enjoys 'a greater potential range of application'. Layder envisions their utility for analysis not only of human agents, per Blumer, but also of social structures and non-human agents, which is critical for the present study's focus upon socio-technical systems. Identification of the close association between the structures of the police, the agency which police members exhibit, and the fundamental role drones play within these separate but connected elements was permitted.

With this study's focus on developing theoretical knowledge regarding police drone use, an associated process of data analysis informed by critical realism ensued. As previously noted, data are theory-laden and theory-dependent and, following Pawson and Tilley's (1997) criticism of method-driven evaluation, the data were collected with a view to so-called theoretical 'orienting concepts' (Layder 1998: 109). There runs a risk, however, when one deploys orienting concepts of flattening out individual experiences observed in the field in order to 'force' data to fit theoretical precepts (Van Maanen 2011: 48). The realist ethnographer, as Van Maanen (2011) discusses, often assumes the role of a 'dispassionate' third-person; an observer principally concerned with, paradoxically, bringing the analytical focus upon the minutiae of the everyday life of informants to promote the authenticity of the account, whilst simultaneously presenting findings through pre-ordained theoretical lenses. The role of the researcher, who is notably absent from accounts, is of 'studied neutrality' (Van Maanen 2011: 47) but also one of constantly linking data to propositions. Mitigating the risk of biased interpretations of findings during the course of the present study came in the form of constant reflexive exercises. For instance: the flexibility of

the preliminary orienting concepts allowed great degrees of freedom to pursue or discard these at will; my role within the setting itself was the focus of unending 'impression management' and negotiation (Hammersley and Atkinson 2007); and the analytical utility of the theories employed was thoroughly interrogated throughout the data analysis phase. This latter point will be developed in the following discussion on the adaptive theory approach which was taken (Layder 1998).

A challenge of realist ethnography is the presumed *interpretive omnipotence* of the competent researcher (Van Maanen 2011: 51–54). As realism presupposes that an objective reality exists, it may appear that a realist ethnographer needs simply only observe what was going on to develop an accurate portrait of the lived reality of the informants. However, due to the fallibility and theory-dependency of the empirical data which were gathered (Danermark et al. 2002; Sayer 2010), a process of negotiation between data and theory occurred throughout the lifecycle of the study. Layder's (1998) *adaptive theory* approach represents a unique and creative means to appropriate the benefits and delimit the pitfalls of deductive and inductive inference. The crux of the adaptive theory approach is that theory and data enter an 'accretive' and continuous interactive dialogue (Layder 1998: 27; see also Bottoms 2008). Unlike inductive inference, which proposes a 'bottom-up' approach to theory generation (see Glaser and Strauss 1967; Strauss and Corbin 1990), or deductive inference, which proposes the testing of theoretical hypotheses (Merton 1967), adaptive theory assumes both roles simultaneously. Being adaptive, therefore, enables one to filter empirical data through prior theory and simultaneously adapt and develop prior theory in the light of empirical data. This study was adaptive in the sense that prior theories were subjected to empirical interrogation in the field, and their merits and demerits (their relevance for the purposes of analysis and drone evaluation) were assessed based on these data.

Alongside the adaptive theory approach, three further critical realist modes of inference and analysis were employed (Danermark et al. 2002). First, *abductive reasoning* represents the procedure of moving from the general to the particular, and vice-versa. The 'general' in this regard represents prior theoretical and empirical conceptions of the socio-technical system of drone policing developed in Chapter 2. The 'particular', therefore, refers to how these general conceptions are applied to, and presented within, the specific case study at hand. The empirical findings of this study were interpreted abductively (coinciding with the adaptive theory approach) and

continuously, opening up interaction between general theory and empirical specificities. This process is also termed 'recontextualisation', whereby prior theoretical descriptions are inscribed in a novel context (Danermark 2002: 89).

Second, *retroduction* was employed as the analytical procedure, requiring the posing of such questions as: 'What makes X possible?', where X represents the concrete phenomena – drone policing (Danermark et al. 2002: 97). Counterfactual thinking is pertinent to retroductive analysis, comprising a series of thought operations concerning the imagination of alternative conditions which may or may not lead to similar mechanisms being triggered. This was a vital component to the data analysis procedure; it forced hard thinking about alternative counterfactuals to determine which abstract conceptions were more or less significant in their effects, and whether they were necessary or contingent for triggering certain mechanisms. As Bhaskar (1998) explains, retroductive analyses remain situated within their points of departure; that is, conclusions drawn from data and subsequent theory which emerges as a consequence are necessarily relative to the contexts from which they are acquired. The task is therefore to propose generative and underlying mechanisms which plausibly explain empirical data in their contingent contexts: 'the building of a model […] of a mechanism, which if it were to exist and act in the postulated way would account for the phenomenon in question' (Bhaskar 1998: 13). Findings from the present study are therefore contingent, local, and transitory. A high degree of coherence has been established through the rigorous methodological procedure and preceding literature review from which the research problems emerged, so conclusions can be suggested to hold epistemic credibility.

Counterfactual thinking may appear theoretical and speculative, but Danermark et al. (2002: 101) posit it as axiomatic to scientific practice: understanding necessary and contingent relations is paramount to understanding the nature of something. Chiming with the adaptive theory approach, counterfactuals led to the process of theory adjudication at all stages of the study's lifecycle. Moreover, the analytical strategies adopted during the data analysis phase oscillated between Maxwell's (2012: 109) typology of *categorising* and *connecting* strategies; that is, analysis was at once focussed upon drawing out similarities between data as well as interpreting data in terms of contiguous relationships. The former strategy bears a likeness to common qualitative analytical procedures – namely coding – in order to construct categories into which data can be sorted. Much like Strauss and Corbin's

(1990) comments on *open* coding (referred to as data 'fragmentation'), these categories served a useful means to impose order on the wealth of qualitative data which were generated. For instance, initial categories emerged during the semi-structured interviews which related to issues surrounding the force's drone programme which informants brought to my attention, suggesting the emic nature of this preliminary analytical procedure. Open coding at the earliest stages of data interpretation furnished an emic perspective on the study as informants conveyed their own meanings in the course of observations, or in response to interview questions, which were in turn translated into tentative categorical schemes related to the theoretical literature on police organisation and practices. In undertaking this 'double hermeneutic', the study remained adaptive (Layder 1998) in order to develop or revise significant concepts in the light of empirical findings.

There were, however, limitations to this categorising strategy. Most importantly, it was recognised that some 'flattening' of data was occurring when segments of interview transcripts or fieldnotes were organised under categories, and to some extent data were becoming 'fixed' and isolated within their respective categories. The decision was therefore taken to adopt also a *connecting* strategy as the lifecycle of the study progressed and more and more data were generated and sourced (Maxwell 2012). This strategy was informed by the so-called 'narrative' or 'story' qualities of qualitative data (Coffey and Atkinson 1996) which resonates in the context of policing (Shearing and Ericson 1991). Data segments were therefore also treated as a text containing a narrative which, to greater or lesser degrees, flowed into other segments. Similarities between informants' discussions on relevant issues relating to, say, piloting a drone during a specific incident, began to emerge and crystallise. More deep-rooted connections between segments, beyond only similarities, then came into view. Thus, the purpose of the connecting strategy was to view the text as a systemic, contextualised whole, and contiguous with the narratives of other segments.

4.6 Access, politics, and ethics

The evidence-based policing paradigm has done much to erode the barriers to access researchers may have been confronted with in early epochs of the academy-police relationship. The service at large is today far more amenable to researchers entering under the so-called 'sacred canopy' (Manning 1997: 21) to gain access to this world which has been previously fortified by occupational members as a respite from the

prying gaze of outsiders and coveted by aspiring police researchers. The establishment of the College of Policing, numerous fora and societies comprising practitioners and researchers working together on policing issues, and even attempts at professionalising the service through direct-entry graduate schemes have each smoothed the relationship between the police and the academy. These changes, as significant to the service as they are to aspiring researchers, have produced an environment in which practitioners and academics can confront policing problems in tandem through close association.

Getting under the canopy was therefore a significant moment during the research; a necessary act in order to gain access to and acceptance from the case study force. The initial connection with the force was made through a link between one of my thesis supervisors and the force's Assistant Chief Constable. A statement of interest was provided to the ACC, involving a short summary of the proposed project, the mechanics of the research, and the intended outcomes as both a piece of academic research and as an evaluative document of potential use to the force.[9] The ACC delegated the project to a Superintendent, who expressed an interest in the study, and an Inspector directly involved with the drone programme. I received an e-mail from the Superintendent requesting a more detailed project information document, and as a consequence I secured a meeting with the Inspector (and, unknown beforehand, another pilot who would become the day-to-day gatekeeper). We were able to negotiate a working schedule, and my contact details were subsequently provided to the soon-to-be gatekeeper where we exchanged a series of e-mails in preparation for my entering the field in October 2018.

Negotiating through gatekeepers in the context of police research can be a difficult process; the unique idiosyncrasies of the service – such as its hierarchical and compartmentalised organisation, along with the occupational culture which has been noted to promote suspicion of (Reiner 2010) and isolation from outsiders (Waddington 1999) – can act as barriers to thwart invasive external researchers. Getting under the canopy through initial (formal) access negotiations only represented one component of a much broader and less straightforward process. I belong in the 'outsider's outsider' camp, described by Brown (1996) as a researcher with no prior associations with the fieldsite (in contradistinction to other types: insider's insider, outsider's

[9] See Appendix B for the project information sheet.

insider, and insider's outsider). As such, I was required to undergo Level 3 Non-Police Personnel Vetting before fieldwork could commence (see College of Policing website, 2017). Level 3 vetting, in theory, enables unescorted access within the force's estate (such as premises and data infrastructure) but this was largely unnecessary in practice; I was usually accompanied by (or, more accurately, *accompanying*) officers. Once the formal access negotiations were settled, an ongoing process of negotiation commenced within the Unit. Potential informants were approached and provided with the information discussed under *Ethical considerations* about the project and, as I became more familiar with the Unit and they with me, new informants approached me.

It is worth a discussion on researcher reflexivity at this point as it flows from the access negotiations and into the proceeding discussion on politics. Once I had penetrated the 'sacred canopy' (Manning 1997: 21) I continued to negotiate access conditions with informants. These negotiations revolved around a particular field impression which I carefully curated throughout the fieldwork period. One of the early impressions I sought to manage was perceptions of my so-called 'competence' as a researcher. This meant that, at times, I would be presenting a fairly high degree of competence (such as demonstrating a good understanding of how a drone operates to impress a particularly technophilic informant, or competently discussing any ethical concerns an informant might have about their involvement with the study, and signposting to relevant information). At other times, I 'diminished' my competence in order to elicit further information; asking 'why' or asking for further clarification were the main techniques used. It enabled me to ask trivial-sounding questions whilst saving face (McLuhan et al. 2014). There were also occasions whereby it was expedient to show indifference towards what informants were talking about or their behaviours; what Goffman (1963) terms 'civil inattention'. I will not divulge the particulars of these occurrences; suffice it to say that a considerable amount of sensitive or operational information was incidentally overheard during the fieldwork period by virtue of my 'being there'. At several points during the observational fieldwork I was instructed to not record specific details. The legal reasons for not recording these are compelling enough that notes were not taken and their details have not been divulged in this thesis.

Political considerations

Being an outsider's outsider also relates to the politics inherent to police research. As previously discussed, this study represents research *with* the police (Innes 2010); a contribution to the knowledge base regarding drones through co-location of researcher and practitioners. This is not a neutral position: critical criminologists have variously made the case for a criminology which is not (and should not be) indentured to the state (Scraton 2001; Hillyard et al. 2004). Evaluations of criminal justice programmes, it is argued, relegate criminology to a 'servile status' in which criminologists behave as 'willing architects' of a State apparatus which propagates perverse strategies of crime control (Hillyard et al. 2004: 371, 374). Scraton (2001: 2), taking a more partisan position, takes the view that criminology should produce '"knowledges" of resistance' rather than knowledges for improving State crime strategies as it does in its current guise of evaluator. Alternative voices are certainly important, and a great deal of critical criminology has drawn attention to (in)justices flowing from criminal justice processes, but I take the view that conflating research *with the police* with research which is an *accomplice* to perceived injustice is disingenuous. Rather, following Hunter et al.'s (2017) guidance, the purpose was to act as a 'critical friend' which is directly relevant to the assumed role as outsider's outsider and evaluator.

This position feeds into the broader criminological debate surrounding its purpose. Currie (2007) asks of criminology: 'So what?'. 'So what?' criminology involves thin theorisation, abstract conception, holds little policy relevance, and employs an unconvincing methodology (Matthews 2010). It represents disciplinary isolation from the public realm; on Currie's criticism, an institutionalised atavism and 'inbreeding' which produces research which is only accessible to and relevant for fellow criminologists.

> An isolated social science, in short, suffers from being essentially unaccountable to the requirements and standards of a larger public discourse, and lacking that accountability it can, all too often, veer into the parochial and self-absorbed, and, at worst, the barely intelligible.
>
> (Currie 2007: 185)

Similarly, Austin (2003) takes up the controversy in his article '*Why criminology is irrelevant*', concluding its irrelevancy as a 'problem of method' which goes to the heart of a much deeper philosophical problem about the methodologies used to

understand the social world (Matthews 2009: 343). For the criminological enterprise to hold relevance beyond academia is not to divide it, as Michael Burawoy (2005) attempted in his call for a 'public sociology', but to engage theoretically-informed interventions established through appropriate methods and sound research. The affordances of critical realism for the present study is that it aims to understand the rationalities informing control strategies and what assumptions and values are involved in this rationalisation, which subsequently permits the determination of 'what works' (or what does not) (Matthews 2009: 351). This knowledge, being developed through close association between researcher and participant, also enables a greater degree of construct validity on the issues at stake.

Ethical considerations

Research ethics is of critical importance to researcher conduct, emphasised by a variety of professional codes of practice as well as the law. Due to the level of access granted to the researcher via the vetting procedure, careful consideration was given to the particular importance of key ethical principles in this context. Moreover, ethics was approached as a situational affair, a process which extended beyond the initial approval granted by the University Ethics Committee and was in need of continuous reflection. Prior to undertaking the research, ethical approval was granted by the Cardiff University School of Social Sciences Research Ethics Committee and ethical conduct was routinely reviewed by the researcher and supervisors throughout to ensure standards were maintained (see Appendix C for the Research Ethics Committee approval letter).

At no point in the study was research conducted covertly. Covert methods are a contentious issue in police research (see for example Holdaway's (1983) seminal account of the pseudonymous 'Hilton' policing division) and therefore an 'absolutist' stance was adopted here (Lee 1993) for conducting overt research. At all stages of the research, informed consent was sought from each informant following the provision of either verbal or written information about the project. Informants were provided with the following information:[10]

- A summary of the research study

[10] See Appendix D for the participant information forms and interview consent form.

- Researcher information, i.e. contact details, University and ESRC affiliations, supervisors' details
- The aims and objectives of the project
- How the information provided was to be used, i.e. dissemination, storage and retention, destruction protocols
- Participant rights, i.e. right to withdraw
- Anonymous and confidential treatment of information

A consideration for research within hierarchical organisations, whereby the researcher negotiates access through a relatively powerful gatekeeper, is the potential for subordinate informants to perceive their participation in the study as an 'order' issued by their superior. This in turn relates to Reiner's (1978) discussion on the 'management spy'. Power relations within the police are straightforwardly managed and expressed in the hierarchical rank structure, where rank confers degrees of authority over subordinates. My relationship to the gatekeeper, who held a position of authority over the informants of PC rank, saw me spending considerable time with them, and I was often introduced to other potential informants through them. To overcome this potential issue, a deliberate effort was made to discuss the research (and the information indicated above) with lower ranking informants beyond the view of the gatekeeper. Through these individual discussions, I was able to convey information and negotiate the terms (if agreed to) of my involvement with individual officers. By and large, and fortunately, most informants consented to participate fully.

The issues of confidentiality and anonymity are two connected but distinct ethical considerations. Data were handled confidentially insofar as informant identities were known to the researcher due to the nature of the face-to-face interviews and the observations. It was emphasised during the initial access negotiations and throughout the study that the force would be anonymised as this constitutes typical social scientific practice. Identifiable information, particularly voice recordings, was gathered through the use of an audio recording device to enable transcription post-interview. No other identifiable information, particularly names and places, were collected or recorded, and interview transcripts were sanitised before being presented in the thesis. All fieldnotes were kept in a secure cabinet on University premises, or securely stored electronically on University servers, and were only accessible by the researcher.

4.7 Limitations

There were several challenges confronting this study. The first area of concern was whether findings could be generalised beyond the immediate case study, i.e. could this research explain the relationship of policing to emergent drone technology in other contexts such as other force contexts? The 'analytic generalisation' (Yin 2014) approach adopted from the outset of this study has already been addressed above. However, it is worth considering the consequences of this approach for the secondary evaluative aim of this study. The question as to whether findings could be generalised to other force contexts – so as to contribute to a (potentially) burgeoning multi- and cross-force evidence base about 'what works' in drone policing was instead re-framed as *should findings be generalised?* The fundamental premise of this case study drew upon critical realist notions of explanatory mechanisms which operate under particular conditions. These mechanisms, whilst drawn from the literature (and thus not specific to the context being studied), were explored in a very specific empirical setting. Whilst police organisations are remarkably enduring in some respects in many others they are transient. The dynamic unfolding and distribution of drone programmes across England and Wales in recent years is one example of some of the shifts which have occurred in technological policing. The picture of drone policing might look very different in the future; our terms of reference might change, new challenges might emerge, new explanatory theories might be needed, and innovative research designs might be required.

The second area of concern related to the validity of the study's findings. Given the adaptive theory (Layder 1998) approach, it was expected that the initial theoretical propositions stated at the outset of this piece of research would undergo a degree of adjudication in the light of the data which were analysed. This process of adjudication enabled deeper and more meaningful analyses of data, reaching more precise explanations for the emergence of drone policing. Throughout this thesis, the constant interplay between theory and data is explored. Future research might embark on studies based on alternative theoretical propositions, draw from different literature sources to generate these, use different sample populations, and pursue divergent methodological plans. The decisions made throughout this research are discussed where relevant, and it is suggested that these might form part of a useful roadmap for subsequent research.

4.8 Conclusion

This chapter has outlined the methodological dimensions to this study. The critical realist philosophical foundations to the study discussed in this chapter and the previous chapter have established the study's focus on the explanatory mechanisms underpinning the emergence of drone policing, therefore setting out how the thesis will address the research question. In order to address this, close ethnographic-based methods were deemed most appropriate. The observational fieldwork enabled insights into drone deployments as well as developing rapport with informants to raise questions concerning the programme's development. This method was most appropriate to exploring some of the key dimensions to this study, especially the occupational-cultural context of drone policing and the diffusion of innovation within the organisational setting. Further supporting semi-structured interviews (or conversations with a purpose) conducted at the outset of the study encouraged the development of orienting concepts which would serve as useful framing devices for subsequent empirical exploration (Burgess 1984; Layder 1998). The documentary component to the study enabled broader historical and strategic contextualisation of the emergence of the drone programme; again, drones do not behave unilaterally or emerge into vacuums. The documentary analysis allowed me to see beyond the immediate fieldwork context in order to situate findings more meaningfully. This chapter in conjunction with the previous has also promoted the methodological opportunities which can be afforded to the evidence base. The proceeding chapters present and analyse findings based on this methodological approach.

Chapter 5: Delivering a drone capability

> Deploying drones is a decision for individual chief constables who ensure that they are used appropriately in the interest of public safety and efficient allocation of police resources.
>
> (Former national lead for drones Assistant Chief Constable Steve Barry, quoted in National Police Chiefs' Council website 2017)

5.1 Introduction

The pernicious legacy of austerity pushes the police service to achieve greater value for money, to 'do more with less', to meet demand with fewer and fewer resources. Concurrently, changing demands placed on the service by increasingly complex crime problems and the inexorable march of technological innovation and change are pulling the service in new strategic directions. Recent reform efforts have introduced new strategic oversight and political players into the governing arrangements of policing. Democratically elected Police and Crime Commissioners exert strategic influence over forces and, most importantly, chief constables, for example (see Jones and Lister 2019). Drone policing is not immune to or isolated from these pressures, but it occupies a unique position. Most notably, drone policing is an operational matter which means that individual forces (as opposed to Police and Crime Commissioners) are largely responsible for the development of programmes. Operational independence is only superseded by compliance with the regulations of drone use in civil airspace set out by the Civil Aviation Authority. The Authority's regulations (the *Drone Code*)[11] govern maximum operating altitude of the drone (400ft), airspace restrictions, and the qualification and accreditation of pilots (to be explored further in Chapter 8).

This is the first data analysis chapter and addresses the study's first initial proposition, formulated in Chapter 2 and restated here:

P_1	The delivery of drone policing is likely more compatible with a de-centralised or local structure as opposed to a centralised structure.

This chapter therefore begins from the position that drone policing represents an entrenchment of 'the local' within operational policing. This initial proposition is

[11] https://register-drones.caa.co.uk/drone-code

explored and eventually 'adapted' (Layder 1998), indicating that the context of programme localism generates a series of mechanisms which explain how and why drone policing has emerged and functions in this de-centralised manner. The data which are analysed to explore and adapt this proposition are principally drawn from contemporary historic documentary sources related to police reorganisation plans, strategic oversight of routine and specialised policing functions, and the rise of so-called specialist capabilities in policing. (See Appendix A for a full list of documentary sources which were analysed.) Observational and interview findings are also explored in the context of actual drone deployments within the case study Unit.

5.2 Operationalising localism in drone delivery

2005 reform proposals

The following reform proposals followed in the wake of a 2005 report by the Association of Chief Police Officers[12] (ACPO) titled *Mind the (Level 2) Gap*. The report focused on service delivery and found considerable discrepancies across police force proactive capabilities. Proposals were made for amalgamating forces into twelve regional 'super-forces' in order to provide more efficient and effective services, making up for shortfalls in service capabilities by what were seen at the time as relatively small forces, and to intervene against complex crime problems through resource sharing arrangements. The reform proposals never reached fruition; the forty-three-force structure survived these reform attempts. In spite of this, the proposals reflect the tension surrounding appropriate delivery mechanisms. The analysis is germane to the notion of localism in drone programmes because it demonstrates the intractable relevance and resilience of the local as an appropriate delivery model for explaining the current state of drone policing.

The National Intelligence Model came into effect across England and Wales following the 2003 National Policing Plan and was designed as a universal mechanism through which forces could go about the business of the 'gathering, analysis and dissemination of information' for decision-making purposes (Joyce 2011: 77). The National Intelligence Model defines three levels of crime types:

- Level 1 are local issues (such as antisocial behaviour and community reassurance) which could be managed by a Basic Command Unit (BCU).

[12] Dissolved and replaced by the National Police Chiefs' Council in 2015.

- Level 2 are cross-border organised crime concerns affecting one or more BCUs that may be regional in scope.
- Level 3 are serious and organised crime activities, terrorism, and extremism at the national and international levels.

Relevant to these classifications, ACPO published in January 2005 its ministerial statement *Mind the (Level 2) Gap* which accounted for service delivery above the BCU level. The ACPO report demonstrated the need for further analysis on so-called 'protective services', identified under the following headings: major crime (homicide); serious, organised and cross-border crime; counter-terrorism and extremism; civil contingencies; critical incidents; public order; and strategic roads policing. These services, which can be described as shading out from Level 1 responsibilities and capabilities into Level 2 (and potentially Level 3), require very different strategic and operational responses, such as cross-force knowledge- and resource-sharing or the oversight of national agencies respectively. Then HM Inspector of Constabulary Denis O'Connor's September 2005 review *Closing the Gap* was initiated by the recommendations made in the ACPO report – namely, (i) to assess national performance of protective services and (ii) to 'establish if collaboration is an appropriate and effective means of addressing any gaps in service delivery' (HMIC 2005: 13).

It was clear that BCUs were generally capable of dealing with Level 1 issues (volume crime was highlighted as a performance indicator by O'Connor (HMIC 2005: 1)), given the rise of police professionalisation which impacted upon Neighbourhood Policing[13] and the general perception that BCUs were well-connected with their local communities and therefore able to better manage community issues. At the other end of the spectrum, Level 3 services were subject to the remit of national agencies which would amalgamate to form the Serious Organised Crime Agency in April 2006. Level 2 capacity, however, was found wanting in terms of performance across England and Wales. To summarise a comprehensive assessment, the main driver underpinning O'Connor's report was that 'size mattered' insofar as delivering protective services to a 'common standard' may benefit from force amalgamations. The findings from the

[13] A proactive and preventative function, the purpose of neighbourhood policing is to connect local communities with other policing services at the local, regional, and national delivery levels.

assessment were ‘stark’, with every force except the London Metropolitan Police and Greater Manchester Police achieving (only) a reactive or limited proactive protective services capability (HMIC 2005: 22).

Recommendations were made on retaining the BCU structure due to their being ‘critical building blocks’ (HMIC 2005: 8) whilst undertaking significant restructuring above the BCU level in order to combine forces. The following selected considerations were offered for this proposal:

- Maximise the size of organisations – the review indicated that forces with approximately 4,000 officers (a ‘critical mass’) were more likely to meet the standards of the national assessment (cf. Townsley and Bond 2006).
- Measure the capabilities of force partners in terms of performance indicators.
- Account for risk and the potential for its reduction through strengths-based partnerships
- Retain the identities of local forces and their individual political, geographical, and demographic boundaries (HMIC 2005: 8-9).

O’Connor’s report suggests a nascent idea that the structural arrangement in England and Wales had reached a junction. The forty-three-force structure has been in existence since the Local Government Act (1972) reduced force numbers from 49, and this disaggregated model drew criticism in favour of a ‘laminate’ model which would see greater interaction between forces organised around centralised hubs of intelligence-gathering in order to inform operational and strategic responses. The proposed picture of police reform would therefore entail an alternative *configuration*, incorporating:

(i) Structural changes (see recommendations made above).

(ii) Enhanced processes of intelligence collation in response to Levels 2 and 3 issues, a performance framework geared toward readiness and proactivity, and efficiency measures to ensure best value in resource allocation.

(iii) More productive relationships between forces and national and regulatory bodies with a clear division of roles and responsibilities (HMIC 2005: 65-66).

Within this configuration, the intention was ‘the creation of forces large enough to provide a full suite of sustainable services, yet still small enough to be able to relate to local communities’ (HMIC 2005: 59). In essence, ‘size mattered’ because local

forces were adept at developing local knowledge and expertise on crime issues in their jurisdictions and could therefore share these resources with others through collaboration, creating a more accomplished and joined-up service delivery.

In response, the then Home Secretary Charles Clarke issued two statements on the matter: a response to *Closing the Gap* issued via the Safer Communities Board (2005) and a written ministerial statement titled 'Police Force Restructuring' (2006). The following has been selected from Mr Clarke's response to *Closing the Gap*:

> As the HMIC report indicates, currently, some forces are simply too small to meet these challenges. We need strategic forces able to address them effectively and to provide the support which localities need. Doing things 43 different ways no longer works and the implication of the HMIC report, which I accept, is that inevitably we will have less forces in the future. But with local accountability for tackling crime delivered by neighbourhood policing, bigger, more strategic constabularies will mean we will have forces ready and equipped for policing in the 21st century.
>
> (Clarke 2005, no page)

The written ministerial statement went on to lay out proposals for regional amalgamations between some forces. Mr Clarke's proposed changes suggested that the police service 'should be close, responsive and accountable to the communities it serves, supported by larger forces with the capacity and specialist expertise to protect the public from wider threats such as serious and organised crime' (Hansard, 20 March 2006: vol. 444 col. 7WS).

Bound up in discussion on force restructuring during this time was the growing recognition of the changing landscape of crime and criminality, and the problems associated with increasingly complex and serious crime problems leading to vulnerabilities in the maintenance of public order and security. Some of the key considerations for O'Connor's 2005 report were the integral roles of intelligence, responsibility, and operational control, which could be better accomplished through collaboration. There was also a sense of achieving greater value for money and making efficiency savings in the public sector, coinciding with the publication of the 2004 Gershon Review and Comprehensive Spending Review. One of the concluding recommendations made by Gershon (2004: 35) was for building a 'culture of efficiency' through establishing joined-up working arrangements, building strong collaborative processes, and being flexible to the demands of both the market and end-

service-user needs. This discourse holds significant consequences for the provision of specialist aerial police capabilities, to be explored in more depth below. The focus of force restructuring at this time was centred on the nascent ideas about connecting local forces to regional and national collaborations; the argument was that forces could combine their local, specific knowledges and expertise with others in order to facilitate greater knowledge-sharing and mount more expert and joined-up tactical responses. O'Connor's recommendations presented above capture these ideas, pointing to a fundamental restructuring of forces above the BCU level which was subsequently reflected in Mr Clarke's statements. However, the efforts also grappled with a significant challenge presented by a historically institutionalised police force operating model, which has engendered in the public a particular view of the police as relatable to their local communities (HMIC 2005: 59). So-called 'community affinity' for BCU-level policing (HMIC 2005: 59) must therefore be balanced against the potential for restructuring above the BCU level to effectively dislocate the BCU from the local communities they serve.

Post-2010 reforms: specialist capabilities policing

Mr Clarke's proposals for regional 'super-forces' were eventually shelved; appetite for significant reform and restructuring was subsequently lost. More recent reform efforts following the election of the Coalition Government in 2010 are now focussed upon the provision of specialist capabilities between smaller regional collaborations more consistently, effectively, and efficiently. Of note are the consequences of the 2011 Police Reform and Social Responsibility Act which shifted the balance of accountability for strategic matters to elected local Police and Crime Commissioners. Contained within the 2011 Act was the 'duty to collaborate', pointing to the provision of policing in a joined-up manner, bringing to bear the varied resources of a range of actors. The structure of contemporary specialist capabilities has therefore transitioned from a whole-service restructuring proposal circa 2005 to plans for a so-called 'networked model' of policing, to be discussed below. There is a continuity between the restructuring efforts of nearly twenty years ago and the current reform efforts in terms of the tension between localism and pragmatism, of effective service delivery using finite resources, and of the attempt to seek alternative operating models in the effort to better enable the service. The *Policing Vision 2025*, produced by the Association of Police and Crime Commissioners and the National Police Chiefs'

Council (APCC and NPCC 2016), is a cornerstone document which has set out the proposed future of British policing within this context. Its priorities include reform under the following strands (APCC and NPCC 2016: 3):

- Tailoring local policing to the complex needs of society.
- Structuring specialist capabilities to respond to extant and emerging crime problems, whilst achieving value for money.
- Attracting and retaining a professional workforce.
- Making better use of digital tools for intelligence and reporting.
- Enabling integrated business delivery through partnership working.

Of interest to the present analysis is the proposed reforms under the 'specialist capabilities' strand, which connects the *Vision* with a deeper historical narrative surrounding the provision of this specific type of policing service, or discipline (Innes 2014b: 68). For purposes of this study, the emergence of specialised capabilities on the reform agenda raises important questions concerning appropriate delivery mechanisms and programme differentiation. The extent to which current arrangements meet the needs of drone-using forces, including the case study force, and the broader questions regarding whether these arrangements are plausible given the research findings, will now be focussed upon.

Specialist capabilities emerged onto the police reform agenda following the HMIC (2015) discussion paper *Reshaping policing for the public*, which formalised the narrative of specialist capabilities against the backdrop of austerity and the changing demands placed upon the service:

> Specialist capabilities (such as those within the Strategic Policing Requirement) and areas of operational and criminal justice support are consolidated into cross-force functions, strategically located and operating to national standards. The most highly specialised capabilities (such as counter-terrorism) should be provided nationally. This would minimise the number of locations required to support an effective police service; allow capabilities common to different policing activities to be deployed flexibly; and preserve access to capabilities for all forces without losing the ability to deploy rapidly on the basis of threat, risk and harm.
>
> (HMIC 2015: 7)

This extract demonstrates the nascent discourse surrounding specialised capabilities,[14] pointing to a tentative operating model consisting of cross-force resource-sharing from centralised strategic locations. There is also a division of labour between those deemed 'highly specialised', such as counter terrorism, compared with the other capabilities discussed in the report such as organised crime, cybercrime, and so forth. This division serves to highlight the strategic priorities engendered within the report – that certain crime problems warrant specific strategic police responses. Key terms such as 'flexibility', 'access', and 'national standards' draw attention to the manner in which these responses might be accomplished, nestled within a delivery model which is national in scope but sensitive to local needs. On local needs, the following is stated:

> Different arrangements for cross-force working will be appropriate depending on the nature of the participating forces. For example, in some areas a larger force might provide the location for these capabilities on behalf of the participating forces, whereas in others, shared capabilities might be added to existing arrangements such as regional organised crime units (ROCUs). This will require further work based on local circumstances and should be an iterative process, focusing first on those areas of specialist capability which should only be provided on a cross-force basis.
>
> (HMIC 2015: 7)

This extract further demonstrates the resilience of localism, indicating that the effective delivery of specialist capabilities must consider local context so paramount to the British policing model. However, the joining of larger forces with the resources necessary to build an inter-force network with (ostensibly) smaller and less well-resourced forces risks flattening out local contexts and operational demands in favour of a centralised model devoid of granularity. This research study therefore maintains the role of case study for investigating the granular experiences of the drone socio-technical system as they manifested in the case study Unit. The provenance of realistic evaluation further imbues this study with the means with which to identify generative mechanisms which produced the changes to operational support policing via drone operations contained within the context of local needs and contentious collaborative arrangements. As the proceeding discussion on the NPAS operating model will demonstrate, meeting local demand through a national structure raises a host of

[14] Defined in this document as 'those relating to counter terrorism, organised crime, cyber crime, major crime, intelligence, public order and armed policing' (HMIC 2015: 6).

challenges, and the fieldwork demonstrated that limitations to national air support provision generated the acquisition of drones which could perform similar functions in a local capacity.

The increasing political relevance of multi-faceted problems which oftentimes span territorial force boundaries and require multi-agency interventions such as 'county lines'[15] (see e.g. Spicer 2019) force a new view on how Level 2 policing problems are registered and addressed. The outcome of the HMIC 2015 paper was the formation of the Police Reform and Transformation Board, and specialist capabilities became a focal point for research and policy discussion with the advent of the Specialist Capabilities Programme (SCP). The SCP was convened in 2016 under the NPCC and signed up to by all chief constables and Police and Crime Commissioners in England and Wales, the College of Policing, the National Crime Agency, and other police associations and partners. Funding made available via the Home Office Police Transformation Fund[16] has seen financial resources released in order to develop and pursue innovative programmes across a range of capabilities, from armed policing and cybercrime, to surveillance and roads intelligence. The Programme defines its work as follows:

> The public expects the police to combat key threats using information and command structures that are wholly unaffected by force boundaries. However, capabilities have often developed in single forces. This has meant that policing has *[sic]* a whole has grown itself in a way that does not maximise the breadth of talent, resources and equipment it has at local, regional and national levels.
>
> (NPCC website, n.d.)

The SCP captured (and sought to resolve) a long-standing discussion on the provision of critical policing functions, pointing to questions surrounding effective governance arrangements, structures, and sustainability. The impetus behind the SCP was to recognise the strengths of the British policing model which has historically emphasised localism at the force level, set against the backdrop of austerity demands

[15] A model of distributing drugs from urban to provincial localities, oftentimes involving the exploitation of young and vulnerable people by inner city gangs.

[16] The Transformation Fund has undergone two phases of funding: phase one (2016/17–2017/18) and phase two (2018/19–2019/20). Details can be found at: https://www.gov.uk/government/publications/police-transformation-fund-investments-in-2018-to-2019 [Accessed 4 February 2020].

and the changing nature of crime. A so-called '"street to global" ambition' inheres within this (SCP Team 2016: 3), suggesting that local policing is capable of intervening in a broad and complex criminogenic landscape.

The capabilities reviewed under the *Phase One Report* of the Programme include:[17] Technical Support Units; armed policing; surveillance; roads policing; and major investigations.[18] Following review of these capabilities, the *Phase One Report* recommends a so-called 'networked policing' model, described as:

> Networked Policing could be characterised as a rebalancing of the relationship between territorial policing and the delivery of specialist capability that aims to retain the best of the local model (which remains the bedrock of the British policing model), while providing an agile response to new and existing threats. (SCP Team 2016: 8)

The Networked Policing model holds, ostensibly, considerable scope for improving collaboration between forces whilst retaining the core philosophy of British policing and its preponderance toward localism. In contrast to the restructuring proposals made circa 2005, the networked model follows an incremental trajectory toward linkages between forces (The Police Foundation 2016) which is broadly in line with the concept of reform embodied within the *Policing Vision 2025* (APCC and NPCC 2016). Moreover, the model aims to achieve incrementalism through mechanisms of governance which are, arguably, more mature than previously, if not at least different: Police and Crime Commissioners, for instance, are identified as key accountability monitors for chief constables participating in networked policing, involving a degree of democratic oversight into the process (APCC and NPCC 2016: 3).

A tentative, non-prescriptive characterisation of specialist capabilities which may benefit from a networked delivery model is offered in the *Phase One Report* (SCP Team 2016: 18-19):

- High fixed costs.
- Significant demand volatility.
- Specialist resource input.

[17] A *Phase Two Report* will review cybercrime, intelligence, and proactive crime (The Police Foundation 2016: 5).

[18] Due to the present research's focus on the relationship between drones and specialist capabilities, an overview of the assessment of other capabilities will be omitted due to space considerations. For full review outcomes, see Specialist Capabilities Programme Team (2016) and The Police Foundation (2016).

- Is regularly demanded and easily replicable.
- Requires no immediate physical presence.

This typology, although non-prescriptive, delineates between specialist capabilities for which a networked delivery model would be either advantageous or disadvantageous. Upon entering the field, I had considered that the networked model could hold potential benefits to drone use across England and Wales based upon several drone partnerships already in operation between neighbouring forces.[19] Using the above typology, it is possible to argue that neighbour-force partnerships alleviate some of the challenges presented by acquiring a drone capability. The following discussion on the applicability of the 'specialist capability' label to drone policing is informed by the observational fieldwork, conversations and interviews with informants, and wider consideration of the potential ways drone policing could develop.

High fixed costs

Whilst variation does exist in costing for a drone, depending on the number and type of drone being procured, these costs could be absorbed by the combined budgets available to multiple partners. Though this raises issues of economic accountability, partnerships can be one way to overcome cost-barriers to innovation, especially for smaller forces with smaller budgets.

Significant demand volatility

Demand for a drone can be subject to considerable volatility for a number of reasons. Firstly, demand for a drone may change depending upon time and place; public events (such as protests, sporting events, political conferences, etc.) within one partner's jurisdiction are likely to warrant an aerial surveillance capability for their duration. A resource-sharing arrangement could therefore be devised which would prioritise drone support to these events for a specified period of time to meet potential operational needs.

[19] According to data gathered by Comparing Police and Crime Commissioners (2017: 5), the following neighbouring forces operate drone-sharing arrangements:
- Surrey Police and Sussex Police
- Devon and Cornwall Police and Dorset Police
- West Mercia Police and Warwickshire Police
- Cambridgeshire Police, Bedfordshire Police, and Hertfordshire Constabulary

Specialist resource input

Drones, whilst not defined as a specialist capability for purposes of the first phase SCP evaluation, nonetheless represent specialised knowledge and resources. Drone pilots, for instance, require licences to fly issued by the Civil Aviation Authority and any data gathered through a drone require a software infrastructure to manage which is itself regulated by relevant data legislation. Similarly, infrastructure for tasking drones through a central control room requires specialised knowledge on behalf of dispatchers to understand how to task a drone effectively, alongside the specialist knowledge pilots require to fly. One of the significant recommendations made following O'Connor's (HMIC 2005) review of Level 2 capabilities was the need for more effective partnership working to enable intelligence-gathering via strategic hubs. It is plausible to suggest that the specialist knowledge and resources which are generated during the lifecycle of a drone programme can be exchanged between partner forces, permitting degrees of institutional isomorphism to strategically guide drone deployments based on the considerable stocks of knowledge partners would inevitably cultivate. Further research on networked delivery in the context of children's safeguarding by Crawford and L'Hoiry (2017) discusses networked approaches as innovating learning processes through 'boundary work'. Issues which cut across boundaries (between partners, or 'communities of practice') can facilitate mutual exchanges of information, reflexivity, and the recognition of strengths-based approaches to working based in different professional frameworks. On drone partnerships, boundaries between different forces (not just jurisdictional, but also in terms of variations in operational priorities dependent upon local issues) can encourage these same mutual exchanges.

Is regularly demanded and easily replicable

Drones can also be regularly requested due to their versatility in the field. Drones are commonly affixed with multi-spectrum cameras for imaging capabilities, but innovations in allied technologies are ensuring that the drone market is constantly evolving. In future, drones will ostensibly continue to achieve greater battery life, be constructed from more robust materials to improve sustainability, and incorporate more advanced sensors and on-board navigation software. A procurement process could also ensure that drones are procured and maintained to a common standard to ensure homogenous quality of service and technology amongst partners. Conversely,

variations between partners' local needs – such as one partner covering urban conurbations and another covering rural tracts – could be met through acquisition of bespoke drones capable of operating in these different environments.

Requires no immediate physical presence

Finally, drones do not necessarily require an 'immediate physical presence' as they are highly mobile and discrete tools. Unlike helicopters, for instance, which require well-equipped and staffed bases to operate from, replete with a complement of support staff, engineers, mechanics, and so on, drones can be stored in stations or vehicles. Aside from a power source to charge batteries, dedicated space for drone storage is almost negligible. Storage costs are therefore significantly less than when compared with other police technologies, such as aircraft and automobile pools. Furthermore, as drones can be deployed in almost any operational environment (pending a sufficient site evaluation by a pilot), their presence on scene can be 'immediate' but they are not a standing capability as, for instance, stationary closed-circuit television is.

The Police Foundation (2016: 28), another key source within the documentary analysis that underpinned this chapter, identifies the following service-wide benefits offered by the networked model, which have been reflected in the above consideration of drone partnerships:

(i) Improved strategic understandings between forces, particularly of supply and demand, sustainability and resilience, and efficiency.

(ii) Strategic development of specialist capabilities through knowledge- and resource-sharing.

(iii) The introduction of a 'brokerage service' whereby partners could provide to and access from other partners' specialist capabilities.

The Police Foundation (2016: 29-30) did, however, identify a series of preconditions to this model which, if not met, could stymie effective uptake of the model. Of particular interest to the present analysis are the preconditions which involve (i) how the brokerage service could meet local priorities in the event that multiple requests are made for the same (limited) resources and, relatedly, (ii) appropriate contingency planning to ensure volatile demand could be met. These two preconditions have been selected from a larger number as they relate directly to the experiences of local drone usage by the case study Unit. In effect, these preconditions, it is argued here, are not

yet mature enough regarding drone programmes across *every* force in England and Wales, which might explain both the piecemeal and fragmentary adoption of drones and the fact that partnerships between neighbouring forces are exceptional. By using Layder's (1998) adaptive strategy, the view that drones could benefit from a networked model proposed in the wake of the SCP review became increasingly untenable. The untenability of networked drone policing is further evidenced in the following fieldnote extract relating to a conversation with one of the case study drone programme's manager. In it, the manager is discussing the idea of a 'baseline' for drone equipment.

> The idea of a national baseline for drone use appears problematic. The national forum indicates that each force holds specific expectations and needs. Some need rugged drones capable of operating in challenging weather and terrain (e.g. freezing temperatures, coastal regions, urban spaces), others need cheaper drones in greater numbers. Forces also have very different budgets and resources set aside for their drone programmes. A national baseline would be problematic if it was to set specific technical specifications – different forces have different needs and capacity to accommodate innovation.
>
> [Fieldnotes]

The extract is broadly reflective of the claims made by Mr Clarke in 2005 – doing things forty-three different ways leads to replication and resource waste. This idea reappeared in later discussion on networked policing, especially in HMICFRS *State of Policing* annual assessment (2020: 42): 'many aspects of policing are common to all forces. And in respect of many systems and procedures, there are strong arguments in favour of making collective rather than individual decisions, to prompt closer alignment'. However, one of the barriers to networked policing recognised in the assessment was:

> the very diverse nature of the 43 forces, in terms of the size of the forces and the geographical areas they cover. For example, the demands facing the Metropolitan Police Service are extraordinarily different from those facing Cumbria Constabulary. Replicated 43 times over, this can make collective decision making at best problematic and at worst impossible.
>
> (HMICFRS 2020: 42)

It is precisely this diversity which drone policing cannot overcome in its current form. The fieldnote extract above highlights the core obstacles confronting the national drone baseline, bound up in the very different operational needs of different forces.

5.3 Strategic dilemmas in police air support

Police aerial capabilities have existed in some form or another since the 1920s, and for approximately fifty years individual forces were responsible for procuring, basing, maintaining, and tasking aircraft to suit local demands. In the 1970s, the Metropolitan Police procured three Enstrom F-28 helicopters and police aviation emerged as a significant operational capability. The current governance arrangement for fixed-wing and helicopter aircraft can be traced back to 1993, when ACPO, the Home Office, and the Association of County Councils devised the *National Police Air Operations Strategy*. Air support coverage until that time was delivered through sixteen Police Air Support Units – fifteen maintained by single forces and one being a collaboration between West Mercia and Staffordshire constabularies – meaning only seventeen of the forty-three forces received dedicated air support. The *Strategy* aimed to rectify this shortcoming by facilitating greater collaboration between forces, and thus the preliminary concept of a collaborative police air support capability emerged.

The 1993 *Strategy* was subsequently reviewed by ACPO in the 2009 *Police Air Operations: A review of the national strategy* which commenced with recognition of key changes affecting the police service during the intervening years. For example, the 2004 Gershon Review aimed to reform efficiency on the 'frontlines' of the public sector, making recommendations on reducing inputs whilst maintaining or surpassing prior performance and service provision. Coinciding with the 2004 Comprehensive Spending Review, which aimed to make gains of £20 billion per year by 2007-08, the Gershon Review identified areas for intervention for so-called 'change agents' designed to streamline public sector efficiency.[20] For police air support, the Gershon Review and the 2004 Comprehensive Spending Review demonstrated a need for balancing expenditure against performance, and the notion of a national air support agency was gained traction. The status quo of the time, characterised by a distribution

[20] 'Potential functions of a change agent': procurement, market shaping, contract management, clustering, communication, benefits tracking, implementation design, and requirements analysis (Gershon 2004: 13). This will be revisited in Chapter 6 in relation to so-called 'evangelists' and their influence over the case study programme.

of Air Support Units providing air support to only a small number of forces led to the following conclusion:

> It is clear that currently there is a real variance in the way air support is delivered both locally and regionally. Across Air Support Units and consortia there are widely differing performance indicators, operating hours, system capabilities and supply agreements. This leads to a piecemeal approach that does not harness the potential economies of scale, which are realised by other operations of similar size, nor does it necessarily provide the best operational effect.
>
> (ACPO 2009: 1)

Alongside the language of 'economies of scale', this conclusion highlights a central challenge presented by disaggregated policing structures, which was criticised in HMIC (2005) in favour of greater strategic centralisation (although in the context of intelligence-gathering, not aerial support provision). Nonetheless, this discourse is continued in ACPO (2009) and the case was made for a nationwide aerial support delivery model which would reconfigure entirely the extant model of the time, and would lay the groundwork for the formation of the NPAS in October 2012:

> To maintain the status quo allows us to do little more than 'tinker' with current arrangements and does little to mitigate risk or deliver an enhanced, more efficient service. Whilst there are clear advantages to adopting a regional structure for Police aviation, this does not allow the full benefit of the recommendations of this review to be delivered and potentially replicates current shortfalls but on a grander scale. Any such structure, although delivering improvements on locally organised aviation is still restricted by locally driven imperatives and wholly reliant on regionally derived agreements to deliver a service.
>
> This therefore leads to the conclusion that a national organisation for Police aviation is required […] This would also allow, where appropriate to the 'best value' case, nationally owned and procured maintenance, stores, command and control and full interoperability across the Police fleet.
>
> (ACPO 2009: 13)

Research on partnerships and governance arrangements, for example Edwards (2002), enables analysis of the manner in which partnerships facilitate or constrain the potential actions of their partners. The analysis therefore pivots on the ontological substance of partnerships, pointing to the necessary relations – referring to the mandatory relations between 'partners' in order to form the 'partnership' – and the

contingent relations – which are nonessential yet comprise the particular context of the partnership and facilitate or constrain the potentials of actors to act. Edwards (2002), drawing upon Jessop (1997), articulates a comparative study of crime control partnerships in two East Midlands, England cities through the lens of 'strategic dilemmas', defined as 'situations in which "agents are faced with choices such that any action undermines key conditions of their existence and/or their capacities to realise some overall interest"' (Jessop 1997, cited in Edwards 2002: 145). Edwards's (2002) comparative study will therefore by 'abducted', in the realist sense (Danermark et al. 2002), and applied to the novel context of police air support partnerships, thus critically examining the substance of current air support governance as it is sustained and/or disrupted by drone technology. The strategic dilemma framework provides analytical clarity to a comparison between air support as provided via NPAS against the local delivery of drone policing. The following analysis will synthesise NPAS documentation with fieldwork data gathered during the course of the present study, demonstrating the points at which drones intervene in and disrupt the strategic dilemmas confronting NPAS. The case will be made that drones represent a parallel aerial technological capability to NPAS's helicopters and fixed-wing aircraft, and that drones provide ample opportunity for the case study force to seek an alternative to the limitations which have been identified in NPAS in the recent HMICFRS (2017) independent review *Planes, drones and helicopters*.

Openness versus closure

Partnerships can be described as a coalition of actors and stakeholders which have been mobilised in support of a common cause, and thus orient themselves around a particular conceptualisation of a problem in need of address. For Edwards (2002: 156), the community crime control strategies in the East Midlands 'translated' crime and disorder into political arguments which effectively defined the problem as one best-suited to the capabilities and interests of their community safety partnerships. In response to the strategic dilemma presented by an uneven and piecemeal air support delivery model, plans for NPAS in ACPO (2009) suggested a degree of 'openness' in terms of how this dilemma was conceptualised and partners mobilised to the cause. Key principles such as 'interoperability', nationally owned storage and maintenance facilities, and centralised 'command and control' functions (ACPO 2009: 13) were presented as a viable solution to the limitations of the air support provision which was

to be replaced by NPAS. The alternative model presented by NPAS therefore effectively mobilised political, economic, and operational interest amongst the forty-three forces and British Transport Police, leading to six NPAS regions across England and Wales housing a total of nineteen helicopters.

'Closure', in contrast to openness, refers to the manner in which strategies of governance flow from particularised conceptualisations of problems confronting coalitions. Edwards (2002: 148), in the community safety partnership context, notes that partnerships which promote specific crime reduction programmes may fail to account for social antecedents to crime and offending behaviours. In the context of police aerial support, it is possible to argue that NPAS has closed around manned aircraft and monopolised aerial support through a collaborative agreement and therefore has limited its potential to anticipate and incorporate the move toward drones at the local, individual force-level. NPAS's closure around particular policing problems it can intervene against is also demonstrated in its Priority 1-3 system discussed earlier, which indicate the types of problems which are more likely to require a staffed air response.

NPAS has been criticised for its lack of intervention in the process of drone adoption (HMICFRS 2017: 62), evidenced by the uneven distribution of drone capabilities amongst forces at the time of writing and the distinct paucity of strategic or operational guidance at the supra-force level. The HMICFRS review concluded the following on strategic guidance:

> One of the key objectives for NPAS is to harness innovation in aviation. Police officers told us that, despite an initial intention to keep police use of drones under review, until very recently NPAS had been largely silent on the matter. *This had left forces to make procurement decisions without expert guidance*, although some forces had obtained information and advice from the NPCC lead for drones and from the Home Office Centre for Applied Science and Technology.
>
> (HMICFRS 2017: 56, emphasis added)

Cooperation versus competition

As a collaborative agreement between territorial forces and British Transport Police, NPAS encourages significant cooperation between partners through the provision of nationally owned and tasked aircraft across the six regions. In principle, this delivery model would homogenise service quality received by partners through a streamlined

procurement process (limiting variation between technical specifications available to partners regardless of their location), centralised storage and tasking facilities (to enable equitable response times), and strategic leadership for decision making and performance review. The funding arrangements for NPAS were part of this homogenisation, with changes made to partner contributions effective as of January 2016 seeing contributions based upon the proportion of actioned calls made by partners in the previous calendar year (HMICFRS 2017: 27). Using 2016 data, HMICFRS (2017: 65) indicates that 66,780 calls for service were received by NPAS, with aircraft sent to attend 57,562 of these calls (86%) and 29,028 calls actually receiving aircraft support (43%). The latter figure refers to 'actioned calls', or those calls for service which NPAS arrived on scene; the discrepancy between sending and actioned calls can be explained because the call was cancelled mid-flight, adverse weather conditions grounded the aircraft, or technical faults disabled the aircraft. The cost of each actioned call in 2016 was set at £1,314 and HMICFRS (2017: 27) found evidence of a perceived lack of value for money amongst forces due to the funding calculation not accounting for attendance rates or response times. One of the starker judgements made was that '[t]here is no clear evidence that current arrangements are financially any more or less efficient than when forces managed their own air support, and costs are not shared equitably between forces' (HMICFRS 2017: 7).

To what extent, then, can confidence in a system with such variance experienced by partners be sustained? In principle, forces contributing toward the proportion of their own actioned calls represents a possible equitable solution, but when considering the vast differences in response times HMICFRS's judgement touches ground. Over half of forces in 2016 waited on average longer than thirty minutes for an aircraft to arrive on scene, which presents significant risks when considering that the majority of calls for service were for a search for a person involved in a crime (32%), followed by a search for a missing or absent person (28%) (HMICFRS 2017: 66). These calls can be described as time-critical, whereby delays in air support could lead to loss of life or limb, or a suspect evading law enforcement or continuing to commit further crime. Drones intervene in this cooperative partnership by remedying some of the weaknesses associated with the NPAS aircraft delivery model, thus disrupting and competing with NPAS to a degree. The Unit's relationship with NPAS emerged as an orienting concept from an interview with a

Unit pilot; the following extract illustrates the informant's views on NPAS, and these were subsequently corroborated during observational fieldwork:

> As I said there may be other things that the helicopter can do that we can't, but ultimately it'll all boil down to – as everything these days – cost, and I think it [drone] will win because of that. I think it'll be interesting once it plays out just to see what happens. I hope there's no animosity because ultimately, it's people jobs isn't it, flying on a helicopter, so I wouldn't certainly want to see anyone lose their job over anything like that because, 'Oh well, the drone can do it so crack on'. That's not what it's about, I think it's just an innovation and a pilot to make things cost-effective. And we're here, and we've got the kit, and we can use it, you know, a call comes in now, we're deployed. Whereas, 'Can you give NPAS a shout for us?' 'Ah they're grounded at the moment, they're just refuelling'. 'Oh, there's a bit of cloud cover now over [local NPAS base], now it's raining they won't make it'. Whereas we [drone pilot] can then say, 'I'm here now, I'm just deploying the drone'. And away we go. So I think it'll definitely benefit us, I really do.
>
> [Interview, drone pilot]

The key theme to emerge from this extract is the convergences and divergences between different aerial technological apparatus which focused further research attentions toward the comparison between unmanned drones and manned aircraft. 'Competition' as discussed in Edwards's (2002) analysis referred to competition for political and economic resources both *between partnerships in a local administration* and *within partnerships*. I would suggest that, given the interview extract above, local drones were not intended to 'compete' with NPAS for political or economic resources. On the contrary, officers were knowledgeable about airspace regulations and were willing to defer to NPAS on matters where the drone was incapable of intervening. Informants were acutely aware that drones were incapable of certain critical aerial functions which effectively limited their ability to deploy the drone as the sole aerial technology to calls for assistance. Uplift of armed officers for an emergency call, for example, can only be conducted using an aircraft with a transport capacity and given a helicopter's comparatively greater operating range, altitude, and speed vehicle pursuits are similarly unlikely to be performed by drones without these same technical capabilities. Furthermore, drone pilots were required to provide their flying co-ordinates to NPAS through the force logging system in case a manned aircraft subsequently needed the airspace; in the event of NPAS arriving on scene whilst a

drone was in the air, the drone pilot would be radioed and receive landing requests.[21] This is a simple matter of safety – a flying drone poses a potentially catastrophic risk to a crewed helicopter in the event of a mid-air collision or even a near-miss (this will be discussed further in terms of the legislative environment of drone operations in UK airspace, Chapter 8).

Governability versus flexibility

NPAS provides a strategic hub for national aviation, thus rendering the problems associated with local and regional alternatives as governable. The relations between partner-forces were initially formalised under the Police Act 1996 and NPAS was ordered by the then Home Secretary Theresa May under the Police (Collaboration: Specified Function) Order 2012[22] (HMICFRS 2017: 48-49). The strategic leadership model follows a collaboration agreement between the forty-three forces (and British Transport Police) and operates under a 'lead force' model. The lead force concept was first introduced in the ACPO January 2005 statement *Mind the (Level 2) Gap* and garnered some support in O'Connor's subsequent review:

> In theory, and with funding, the 'lead force' concept offers possible progress, albeit it would have significant implications for smaller forces in relation to the control and direction of inquiries conducted within their own borders, changes that they would need to acknowledge.
>
> (HMIC 2005: 10)

West Yorkshire Police has served as lead force since NPAS's inception, whereby the chief constable manages NPAS staff and the Police and Crime Commissioner 'owns (or leases)' aircraft (HMICFRS 2017: 48). Strategic guidance is issued via the National Strategic Board, which is chaired by fourteen voting representatives of: one local policing body and one chief officer each from the six NPAS regions across England and Wales; West Yorkshire Police chief constable; and West Yorkshire Police and Crime Commissioner.

As the discussion on 'closure' has demonstrated, the lack of a strategic lead for drones at the national level has closed NPAS off from intervening in the provision

[21] There are certain circumstances in which this may not be necessary. Several informants stated that due to the different operating altitudes of drones compared with helicopters, both aircraft may be able to be airborne in the same airspace during, for example, a public order call.
[22] See http://www.legislation.gov.uk/uksi/2012/1690/contents/made [Accessed 12 June 2019].

of drone capabilities; instead, drones appear to be a local matter falling under the purview of individual forces and their chief constables. NPAS reported to HMICFRS (2017: 82) that funds were being sought in the 2017/18 funding round of the Police Transformation Fund for two projects, one regarding the governance of police drones, the other regarding NPAS's operation of large drones for 'coastal surveillance duties'. However, these proposals were rejected by the funding board. Local drone capabilities therefore capture the notion of 'flexibility' due to their capacity to respond to the specific local needs of forces, a view which chimes with the HMICFRS (2017: 82-84) review's participants.

5.4 Responding to national air support shortfalls

A recurring theme throughout the fieldwork was a subtle criticism of NPAS. During a number of responses to incidents, officers would look to the skies, point out a cloud hanging somewhere off in the distance, and proclaim that NPAS "wouldn't be flying today". Initially I had interpreted these as off-hand comments, intended perhaps as a collegial 'dig' at NPAS pilots. But as more time was spent with officers and a clearer understanding of the technological accomplishment of Unit policing developed, the lack of NPAS support highlighted a much deeper problem. Criticism of NPAS is not a particularly novel finding, nor is it reserved to the context of this study. The HMICFRS (2017) review of police air assets discussed throughout this chapter support this finding. The issue at stake for Unit policing was that difficulties in accessing air support from NPAS significantly impacted upon the ability to perform its portfolio tasks, and the availability of a local drone capability vastly improved the Unit's ability to respond to incidents which would otherwise be hindered by lack of NPAS coverage. To illustrate the limits to NPAS coverage, one officer claimed in an interview that, during their approximately four years on the Unit, NPAS assistance had been received by their shift a total of four times. During the fieldwork period, no requests for NPAS were observed to be made. Instead, NPAS was notified through the force reporting system of Unit drone flights (whether operationally or for training purposes) to ensure that, in the event that a NPAS helicopter was to enter the airspace, helicopter pilots would be aware of the flying drone and could direct the drone to land if necessary. The following fieldnote extract produced during a training flight illustrates this:

> If a NPAS helicopter pilot requests the drone to land, drone operators generally see no problem with this. One informant indicated that a mid-air collision between a drone and helicopter could potentially crash the helicopter and risks harming the helicopter pilots on-board. Airspace priority may therefore go to the helicopter based upon a rapid risk assessment and a degree of deference by drone operators to the helicopter.
>
> [Fieldnotes]

Potentials and explanatory mechanisms: how drones replace need for NPAS

The following three mechanisms – operational, tasking, and cost – are discussed below to explain how, under what circumstances, a drone can replace the need for NPAS air support. These mechanisms are derived from fieldwork findings and each separately explains the benefits afforded to operational policing by a local drone capability.

M_1 – The 'operational' mechanism

The potential for drone technology to intervene within operational contexts is either enabled or constrained by the powers available to the technology itself. Technical limitations such as battery life or the ability to fly in inclement weather pose their own set of challenges in the oftentimes spontaneous nature of police incidents and, given that drone deployments near-universally occur outside,[23] the powers of drones become constrained in adverse conditions. Conversely, the powers of drone technology are enabled by a different set of technical affordances, such as their capability as an aerial and remotely piloted tool for extending visual line of sight. Informants consistently suggested that drone technology was only surpassed by a helicopter under two operational circumstances: uplift of officers and vehicle pursuit. Whilst the latter in particular was of importance to the Unit, given its task responsibilities, this was not presented as a significant limitation to the drone. Rather, informants were well aware of this and were generally accepting that NPAS still held operational superiority in this regard. This was reflective of the relationship between tasks and technological capabilities (Goodhue and Thompson 1995); drones are appropriate in some circumstances and not others.

[23] Drones can be equipped with a 'roll cage' attachment allowing the drone to function inside and 'bump' off walls or travel along surfaces whilst protecting its rotor blades (and its surroundings) from damage. This would be a viable option for law enforcement or other emergency services in certain situations. For example, sending a drone inside a building to detect and identify structural damage to minimise the risk of building collapse to personnel.

The differences between drones and helicopters are perhaps not so stark. NPAS has maintained that drones will not replace helicopters, citing helicopter capabilities such as (i) operating as a staffed command and control platform, (ii) longer operational endurance, and (iii) greater size (NPAS 2017). Yet the distinctions blur and drones emerge as a possible replacement tool under these terms of reference. Whilst not staffed (by definition drones are unmanned), drone footage can be live-streamed to a remote control centre or streamed to a local device (such as a tablet) to enable real-time intelligence analysis by officers on the ground or streamed remotely to a control room. This was one possible avenue for further innovation by the case study Unit but, during the fieldwork period, this remained a proposal and had not reached fruition. Drones can therefore be slotted into extant technical networks comprising other forms of data gathering, analysis, and communication streams which enable the reproduction of these technical activities (Lawson 2008).

As for operational endurance, NPAS helicopters may have a longer endurance in principle (approximately two hours), but this also includes time taken to dispatch from a base, arriving at the scene, and time back to base. Although HMICFRS (2017: 6) acknowledged that NPAS has consistently met its response time targets year-on-year, this 'says more about the nature of the targets than the speed of response'. Approximately 70% of requests for service were allotted a response target of 60 minutes; given NPAS's prioritisation system, this indicates the majority of calls for service are designated Priority 2 or 3.

- 'Priority 1: Incident requires the immediate response of a National Police Air Service asset the failure of which could result in a serious impact on the outcome of the incident.'
- 'Priority 2: Incident requires a response of a National Police Air Service asset but not deemed immediate however requiring the asset on scene normally within 60 minutes or otherwise as agreed with the Operational Commander, the failure of which could result in a serious impact on the outcome of the incident.'
- 'Priority 3: Incident, potential incident or other task requires the non-immediate response of a National Police Air Service asset however the response time will be agreed between the National Police Air Service and the customer to co-ordinate the most appropriate level of service.'

(HMICFRS 2017: 19-20)

In contrast, a drone can be rapidly deployed on scene, with an average 'bag-to-air' time observed at around 30 seconds to 1 minute and maximum endurance of

approximately 60 minutes.[24] Being easily transported by an officer on foot in its carry case or stored in the back of a vehicle, the manoeuvrability and accessibility of a drone to an incident is a vast improvement on NPAS response times. This is further compounded by the Unit's (and its drone pilots') access to fast vehicles which could traverse the force area in around 40 minutes on a 'blue light run' via the strategic roads network.

Finally, the greater size of a helicopter is an obvious difference. The drone used by the Unit weighed no more than 7 kg in order to meet legislative regulations (to be discussed further in Chapter 8) which limited the amount of equipment which could be mounted on-board. In some operational circumstances, this size differential can be a force multiplier in the sense that the helicopter can bring to bear more sophisticated data gathering equipment. There is also an aesthetic component to this. One informant relayed a past experience of a drone training flight which resulted in observing a person suspected of using drugs in a nearby wood. The suspect had apparently not seen or heard the drone overhead until the officer approached them. Would this have been the case with a helicopter flying overhead? The smaller size of the drone presents further benefit in operational contexts when compared against a larger aircraft. Consider the following fieldnote extract taken after viewing footage of a drone flying beneath a dense tree canopy during a site investigation of a fatality:

> The drone is able to deftly negotiate the dense canopy, flying beneath the treeline to hover directly above the incident. I am told that a helicopter was requested on scene – however, its cameras could not penetrate the canopy nor could it fly low enough to access underneath the treeline. The drone was therefore able to record images of the scene – location of the body, access routes for emergency vehicles, any dangers presented by terrain and foliage, etc. – and relay these back to staff on the ground.
>
> [Fieldnotes]

Without the drone, the scene would have remained impenetrable to other aerial modes of data collection and, compounded by the inaccessibility of the area to both officers on foot and on board a helicopter, safety concerns could be more effectively managed.

[24] This is under ideal circumstances. Wind, altitude, flying speed, and use of on-board cameras will drain the battery more quickly, resulting in a realistic average flight time of around 40 minutes in most operational circumstances. Greater demands placed on the drone will significantly reduce this.

In this case, the operational mechanism of small size facilitated greater situational awareness and operational planning for the safe retrieval of the body.

M_2 – The 'tasking' mechanism

Two types of tasking exist for drone flights. 'Spontaneous' tasking refers to calls for service received during an incident *in situ*. Spontaneous flights might also be conducted by a pilot during their routine working day; for example, the pilot may store the drone in their vehicle and choose to fly the drone when they arrive at a scene. 'Pre-planned tasks', in contrast, are those which have been requested ahead of time, and are thus usually less time sensitive. Pre-planned tasks may be scheduled by an officer requiring thermal imaging of a suspected cannabis farm in a residential property, or to survey a site in advance of the execution of a warrant. Whilst NPAS also performs through this tasking mechanism, as HMICFRS (2017) has demonstrated, and corroborated in interviews with Unit informants, the reliability of NPAS to attend a spontaneous task is criticised. On NPAS pre-planned tasking, the following was discussed in interview:

> In terms of positive results, in terms of speeding up the process for pre-planned things, so trying to get the NPAS out for a thermal imaging, you might be waiting 2 weeks, you could be waiting 3 weeks, you know, they've got to try and fit it in, they're pulled from pillar to post as well, they're covering the whole country essentially aren't they? So it's understandable, if they've got a high risk missing person well they're not gonna do your cannabis thermal.
>
> [Interview, pilot]

On spontaneous drone tasking, two empirical issues were of relevance which served as useful orienting concepts for understanding this process: (i) expediency and (ii) promotion.

Observing a responsive Unit, tasked predominately through the Force Incident Managers and control room, I became familiar with the irregular calls for assistance which were received. Observational periods were usually slow-going affairs, with time spent running errands between stations, waiting at stations, conducting drone training flights, and punctuated by sporadic episodes of activity. Expediency was a key factor in Unit response times and activities – a late response could spell disaster in the case of "saving life or limb". A related aspect of expediency was observed when compared against the wait times for NPAS assistance, which was the ability for spontaneously

tasked pilots to rapidly respond to calls for assistance which would otherwise be relegated to a pre-planned task by NPAS and potentially induce a significant waiting period of several days or weeks. This meant that other departments, presented in the below fieldnote extract, could more quickly make use of the technical activity associated with the drone (such as gathering intelligence) which in turn positively impacted upon their own social/occupational portfolio tasks and free up their resources in the short-term.

> Upon arrival at the station I was informed that we were to attend a call for assistance in the search for high value stolen property. The detectives on this case suspected that the property had been discarded in a nearby valley – weather conditions were poor, vehicle access was limited, and the terrain was treacherous to a search party on foot. The pilot's task was to fly the drone over the valley, using the camera to either identify the property in-flight or to upload the footage to a computer screen in their station for later investigation.
> […]
> Between flurries of snow the pilot sends the drone over the valley and begins collecting visual footage. Visibility is poor and the pilot has to land several times due to the risk of snow damaging the controller or drone. The missing property was not identified during the flights.
>
> [Fieldnotes]

Whilst the missing property was not located during this flight, it illustrates how the expediency mechanism is triggered by a locally available drone capability. The incident was, according to the detectives, suspected to be related to a series of prior organised acquisitive crimes in the surrounding area. Having access to drone-enabled visual data gathering enabled detectives to continue in their investigations, as the (unsuccessful) drone flight helped rule out where the property was not and narrowed the search radius. Turnaround and reliable tasking are therefore enhanced by a local drone programme which is responsible *only* for its associated force, in contrast to a national service pressured by technical, financial, and staffing constraints.

The second concept – promotion – was a less significant aspect of tasking given the ongoing state of the drone programme's emergence. The challenges identified by programme managers, particularly in installing training procedures amongst the Force Incident Management team, have been discussed previously. A related part of the programme's promotion in terms of spontaneous tasking was the predominance of what is termed here an 'informal' tasking procedure. The issue first came to light during a training flight with a pilot which was cut short following a call

for assistance from a local neighbourhood officer. Over the radio, the requesting officer speculatively asked whether the pilot in question had a drone available and if it could attend an address for the execution of a warrant. The same pilot, during a later training flight, called into the control room and gave the drone-specific call sign informing the control room that a drone was available in that geographic area of the force. This appeared to be a source of pride for the pilot, promoting the fact that they were available to *"any calls"* which the Force Incident Managers may receive. Promotion through informal tasking (i.e. receiving speculative calls directly to the pilot or by having to inform the control room of their availability) points to a significant limitation regarding the level of 'saturation' which the drone programme had achieved within the case study force at large, and highlights its emergent state of being.

M_3 – The 'cost' mechanism

> […] NPAS now gets streamed according to price. So even if you have a spontaneous incident the FIM [Force Incident Managers] will stream that cost and make their own assessment on whether they want it according to cost. Which is part of NPAS's concerns that we're making assessments not on risk but on cost. Because if you used to request it: 'Can I have NPAS?', 'Yeah it's on its way or it's not available'. It never used to be, 'Why do you want it?'. Now you get asked, 'Why do you want NPAS?'. And I think over time as we're already seeing now probably demand for NPAS is falling apart from the very high risk to life. And I think over time they'll want that less and less and I think more and more the drone will come into it and that's where I think you'll see the biggest impact because the drone will be more available more quickly.
>
> [Interview, programme manager/pilot]

The funding calculation for NPAS currently sees partner forces contributing a portion of their annual budget which gave NPAS its 2017/18 annual revenue budget of £38.3m (HMICFRS 2017: 27). On top of this portion of their annual budget, forces are also charged an additional cost per actioned call for service (where NPAS arrives on scene) which was £1314 in 2017/18 (HMICFRS 2017: 27). Ultimately, NPAS costs are not shared equitably amongst the partner forces (HMICFRS 2017: 26). In contrast, the acquisition of drone equipment represents an initial outlay of costs – cost to procure the equipment, training, associated development of necessary infrastructure such as software management systems, etc. – but once these costs have been met, there is no further cost associated except in terms of paying for pilot salaries and electricity costs

for recharging batteries. Compared with NPAS, a local drone therefore presents an attractive financial prospect, if only if it means the additional cost per actioned call is avoided. In relation to expected calls for drone service discussed in early interviews, the following was discussed:

> So it's how you measure that success. I think we will deliver what the job wants. I'm not sure, I think demand may outstrip what we can deliver because I think people will hear about the drone and we'll be so accessible to them with near zero cost on the delivery that they're not going to think, 'If I call the drone now it's going to cost me seventeen hundred pound an hour'.
>
> [Interview, programme manager/pilot]

Furthermore, the comparatively low cost of drone equipment was used as a political device by the programme members following the drone crashes in the 'going live' phase. Costs for repairs following the crashes were quoted by the manufacturer at approximately £1000. An informant mentioned that this was a cause for concern amongst some senior staff members, who initially dismissed the claim as an unjustifiable expense. But programme leaders were able to frame this expense in comparison to the cost of a single actioned helicopter call which would greatly exceed this. Eventually the programme leaders were able to release the funds which they had sole responsibility for to pay for the repairs, but it was an interesting comparison to make. The drone's value for money was therefore present as a mechanism which was triggered in this context of spiralling NPAS costs.

5.5 Discussion

This chapter has explored the localised context of drone delivery across England and Wales. It demonstrated that the current admixture of drone programmes is fragmented and highly local, with individual forces maintaining considerable oversight concerning their programme development. The analysis of NPAS demonstrated the limits to partnership approaches to air support and provided evidence in favour of the local model of drone delivery. The seemingly inescapable strategic dilemmas of providing national air support are subverted by local drone programmes, providing a means for forces to make up for significant shortfalls in NPAS support by developing aerial capabilities which are more responsive, cheaper, and more straightforwardly delivered. Whether drone technology alone spells the end of NPAS is unlikely as this

overstates what drone technology is (and is not) capable of. There are some core tasks which helicopters are just plainly more appropriate for, such as uplift of officers, vehicle pursuits, and acting as a mobile command and control platform to feed live information down to officers on the ground. In this way there may be a stronger correlation between drone emergence and the uncertain future of NPAS. This is compelling evidence for a transformation in police air support over recent years; as drone technology becomes increasingly distributed across local forces, the capacity for NPAS to maintain its strategic grasp over police air support is claimed to be problematic. The apprehension of the strategic dilemmas revolving around police air support therefore points to an operational opportunity for local drone programmes to emerge and intervene in the challenges presented by nationally organised police air support. Drawing upon Lawson's (2007, 2008; see also Archer 1995) Transformational Model of Technical Activity (TMTA) approach, the ontological priority afforded to drone technology within this research is maintained through analysis of the *technical* and *social activities* which transform the delivery of aerial policing in this context (see explanatory mechanisms M_1-M_3 above). Thus, drones are presented as both a condition and consequence of the mechanisms triggered within local programmes.

Returning to the initial proposition stated at the outset of this chapter, it is possible to now 'adapt' it in the light of these findings. The proposal was that drone delivery is *likely* compatible with a decentralised structure. This can now be specified to draw the conclusion that: *The current localised arrangement is the most effective means to provide drone air support, particularly given prevailing barriers to accessing air support. Drones enable the local delivery of specialised air capabilities*. The addition of the documentary and fieldwork data relating specifically to the limits to NPAS support represents the adaptation to the initial proposition. Prior to conducting data collection and analysis, it was not anticipated that criticism of NPAS provision would feature as prominently as it did. The novelty in this finding is that it provides practitioner perspectives on how air support affects operational policing 'on the ground'; the quotidian implications of knowing that NPAS are likely unavailable and/or how past experiences of NPAS lead to officers seeking alternative support (i.e. via drone) also makes an important qualitative contribution to the evidence base. Furthermore, it challenges critical social science literature which tends towards a homogenous view of state ambitions to roll out drone technology uniformly (see e.g.

Shaw (2016) on the concept of ‘enclosures’ and Neocleous (2013) on police air power). Instead, it was found that programme fragmentation and de-centralised was a function of extant challenges involving the delivery of specialist capabilities across England and Wales. The emergence of drone policing *in action* can therefore be registered as a response to shortfalls in service delivery rather than as a thought experiment in how police seek total and unilateral control over subject populations.

Chapter 6: Organisational enrolment

6.1 Introduction

Chapter 5 discussed relatively 'distal' conditions of emergence which were related to the broader historical tension surrounding centralisation and localisation in police structures in England and Wales. This tension highlighted the types of delivery models for the provision of specialised police capabilities, with drone policing existing on the periphery of national police discourse at this time but capable of intervening against the problematic nature of Level 2 policing problems. The chapter concluded that these distal conditions plausibly explain the fragmented and expressly local nature of police drone programmes across England and Wales. Further to the National Police Chief's Council lead for drones, Assistant Chief Constable Steve Barry's claim that drones are an 'operational matter' for local chief constables (NPCC website, 2017), the case was made that developing knowledge about these local contexts could illustrate how these contingent conditions may (or may not) be realised across these contexts (Sayer 2000, 2010).

The present chapter therefore builds upon this concern by focussing upon the specific, 'proximal' context of the case study Unit. Of particular interest are the organisational features of the Unit's drone programme which illustrate how drone technology became enrolled into pre-existing structures and practices (see Lawson 2010). By examining the transitionary process beginning from the drone capability as a 'proof of concept' and its (chaotic) diffusion throughout the case study Unit, the argument is made that drone policing was importantly conditioned by the idiosyncrasies of police organisation and the affordances and liabilities of the technology itself. The chapter therefore begins from the initial proposition:

P_2	Drone technology must enrol within an organisational structure which enables and sustains innovation.

6.2 Technological transitions

Chapter 5 presented the contemporary trend toward police 'localism' against 'centralisation' as a powerful, distal contingent condition which plausibly gave rise to specific generative mechanisms which explained the emergence of drone policing in

the case study context (see Jones and Lister 2019). The explanation offered was borne out of an analysis of the changing provision of specialised policing capabilities, evoking models such as 'networked' policing against the widely criticised delivery model of the National Police Air Service (NPAS) (see HM Inspectorate of Constabulary and Fire & Rescue Services (HMICFRS) 2017). This section returns to the notion of localism in a more specific manner by charting the technical and organisational development of the case study drone programme. The discussion supports the study's realistic evaluative purpose as it is based upon longitudinal research which enabled understanding of the development of the Unit's drone programme over time, replete with observations of setbacks, learning, resilience, acquisition and manipulation of organisational resources, and so forth (Wilson 1979). It also establishes the empirical groundwork for the proceeding discussion on technological diffusion, which further explores the internal relations between programme members and the production of drone policing as a viable operational resource within the research context. This section therefore indicates that the local conditions which made drone policing possible represented a series of emergent mechanisms, which were triggered at different points during the developmental, transitionary process of the drone programme. Technical activity, such as the inherent value recognised by programme members in drone equipment, is combined with social activities such as ongoing learning and evaluation.

A perennial challenge presented by the case study was the rapid and oftentimes erratic development of the Unit's drone programme. In some ways this highlighted Carrigan and Housley's (2017) critical treatment of so-called 'fast scholarship' on emerging technologies; the pace of innovation has disrupted the academy's ability to engage in 'slow', critical, and considered analyses. In an effort to confront this challenge, and to analytically arrest the rapid pace with which the drone programme developed, the research employed three 'orienting concepts' (Layder 1998). These concepts are categorised as the transitionary process from 'proof of concept' to 'pre-going live' and 'going live'. It is important to note, however, that these are not discrete categories and are not being presented as singular 'points in time' but rather as a generally linear temporal phenomenon which was episodic and sometimes iterative, forming a mutually reinforcing feedback loop over time.

Phase I: 'Proof of concept'

Drone capabilities came under Unit responsibility several years prior to the study's commencement. The historical details presented next are based on accounts provided by informants and corroborated through discussion with two programme leaders. The drone programme began with two so-called 'proof of concept' drones which were off-the-shelf devices procured for the purposes of testing the Unit's capacity to accommodate drones and to evaluate the opportunities and challenges presented by this innovative technology. A business case had been submitted to senior force administrators through a 'staff suggestion scheme' which costed the procurement of drone technology and proposed a preliminary analysis of the potential benefits. These benefits generally revolved around the potential for drones to assist in routine police business undertaken by the operational support Unit and the allied roads collision investigation team: photographing a crime scene, reconstructing road traffic collisions from the line of sight of drivers to provide supporting evidence for court proceedings, enhanced surveillance capabilities for operational planning, and so forth. According to the programme members, some forty operational deployments were monitored, evaluated, and analysed during the years of the proof of concept phase. This series of successful deployments (in terms of the drone achieving a clearly identified outcome) had therefore demonstrated the utility of a drone capability within and to the force. One particular deployment was often cited as an exemplar in this regard, with interviewees referring to it and footage from the deployment used in force training events.

> But our very very first deployment we were called, it was the very first time we went out on part of the project, I got called by a DCI *[Detective Chief Inspector]* whether we could attend a location where they think there was a body in a location where nobody could get to. Because it had been there for a long time somebody said it was a carcass, some said it was a body, so we brought in NPAS, NPAS couldn't get close enough but took photographs […]
>
> […] so at this stage we're now like probably a week or two down the road when this DCI contacted me and said, 'Is your drone up and ready on the project' and I said, 'Yes it is'. 'Could you bring it down to this location, send it out and try and identify what this is?' So we go out and send the drone out and within two minutes we could identify exactly what it was. And it could have saved the force and other people quite a considerable amount of money but at that stage we had only just started that day and they call us and it worked really really well. Not only did it save a lot of money, we found that it was not an animal but a human so we were able to identify it straight away.

[Interview, programme manager]

This same example was used in one of the force training events which I attended. For this training event, several members of the drone programme had arranged to deliver a presentation to force members (in attendance were neighbourhood police officers and detectives) about the drone capability. Although the drone programme had yet to 'go live' (i.e. was not officially designated as a force-wide resource given the developmental work still in progress between pilots, the manufacturer, and the technology itself – to be discussed below) the intention was to foster knowledge about the potential for drones for various types of police work. For instance, the drone was presented as a possible tool for gathering evidence in fatal road traffic collisions to detectives, supported by footage taken of a drone providing a clear aerial view of a live scene below. This 'promotional' aspect of the drone programme will be explored further below.

When this study was in its developmental stage and during initial access negotiations with force gatekeepers, discussion had turned to cost-benefit analysis (in monetary terms) as a possible evaluative measure for the drone programme as it was set to transition out of the 'proof of concept' phase. During the initial access negotiations, I had proposed to the primary gatekeeper that achieving value for money is a common intended outcome of innovation uptake within public services, particularly in austere times. My line of inquiry with gatekeepers followed the route of questioning whether drones could, using the example of a search for a missing person, promote cost-savings in terms of one or two drone pilots replacing a greater number of officers required to complete this same task on foot and without drone assistance. The extending capability of drones to provide aerial visuals over a search area coincided with fewer personnel needed, and therefore saving person-hours and attendant salary costs. This proposal was, however, at odds with informants' perspectives on what constitutes an innovation's 'value', and the evaluative measure required significant adaptation (Layder 1998). Value was therefore to be understood through close association with informants and the nature of 'the job' or, in other terms, what operational value was recognised within the drone by informants. It translated into notions of *"keeping resources slack"*, *"saving life or limb"*, and having drones available as a *"tactical option"* for operational tasks (Fieldnotes). Any cost-savings

were an added bonus, not a primary driver behind the acquisition of drone technology. The following interview extract illustrates this perception of value:

> If it's gonna save lives there's no cost because you save one life it doesn't matter what the cost of the drone is to get it in the air […]
>
> Of course […] did it save us money? Or didn't it save us money? Did it save lives? And for me, if the investment of, say the £30,000 for the drone saved a life I think it's paid for it. I mean you can't put a cost on it so, we don't know. And I've spoken to loads and loads of other forces and they're all like, 'Yeah it's brilliant, it's great', but no one's put a cost on it yet. The only thing they have said is it might be that, it has saved money, but it's given us other options, tactical options to deal with what's in front of us at the time rather than having nothing […]
>
> And one of our Supers [Superintendent] has already said that, '[…] if it saves one life it doesn't matter about the cost'. He's already said that. And that was quite early on when I was going through all the Boards for the business cases, which I was quite pleased about. I think when we talk about cost savings I think it's about, people used to say, 'Doing more with less'. I switched that and thought, 'We want to do less with more' […]
>
> [Interview, programme manager]

Proving the concept of drones was therefore not entirely consistent with a cost-benefit analysis in terms of potential financial resources saved. Instead, it was closely aligned with the organisational resources which were anticipated to be saved and the nature of operational tasks for which officers' capabilities could be augmented by drones. The following fieldnote extract illuminates the idea of *"keeping resources slack"* and the extending capabilities of drone technology for aerial, visual data-collection. The extract refers to a PSU (Police Support Unit) training event, during which sequences of officers were evaluated on their method of entry skills for the execution of a warrant. Prior to this, a programme manager had delivered a presentation to these officers featuring footage collected from the Unit's own drone deployments and from other forces across England and Wales. Footage presented a series of operational incidents such as method of entry to properties and a training scenario in which the drone was able to clearly identify a group of 'violent persons' using its thermal camera.[25] Fieldnotes taken during this presentation noted the following:

[25] This footage was collected from another force in England and Wales during its own training event.

> The drone is being promoted here as a potential operational tool. [Programme manager] has directly presented the utility of the drone to these PSU officers and commanders. Perhaps [manager's] own experience on PSU deployments assists in this – they know what a PSU commander needs in order to direct officers on the ground and how this can be augmented by an aerial drone capability. The inclusion of footage seems to provide further evidence supporting the drone's value – a useful visual aid demonstrating a variety of deployments to both promote interest and connect the drone to the audience's own experiences, evoking the relevance of the drone to future instances where an aerial support device will provide an invaluable 'eye in the sky'.
>
> [Fieldnotes]

The 'eye in the sky' capability of the drone to PSU operations was further developed during the events of the day's training:

> [Programme manager] meets with a PSU Inspector and asks their thoughts on the drone presentation. The Inspector appears interested in the drone and goes on to ask questions about the benefits of a drone to a PSU commander on the ground. Their experience on PSU suggests that tactical knowledge for deploying officers on the ground is a primary issue, but that risk is necessarily involved. Risks such as blind corners, unknown numbers of potentially violent crowds and possible hotspots, available thoroughfares and roadblocks, points of ingress and egress etc. present significant challenges in the volatile environment of PSU. Having an aerial drone to provide visual information is well-received, as it delimits these risks and allows commanders to direct their officers with real-time clarity of the situation on the ground.
>
> [Fieldnotes]

These observations formed a crucial part of the understanding of the proof of concept phase, adding further evidence to the notion that *operational effectiveness* in terms of *"keeping resources slack"* and managing risk more generally was prioritised over cost-savings. The above fieldnotes refer to a particular context of policing (PSU) which encompasses a unique set of operational deployments – predominately spontaneous and pre-planned public order/public safety events. But as an insight into the contextual significance of drone use, it was demonstrated how the causal powers of drones to facilitate real-time intelligence gathering, aerial site management and reconnaissance, and/or promote the safety of officers on the ground were seen to be realised within this particular operational context.

The above interview also supports claims to 'doing less with more' (Innes 2011) which runs counter to the premise of 'doing more with less' characteristic of austerity-era public service management. Doing more with less is predicated upon

maximising limited resources, intensified in an austere environment which has seen significant reductions in public expenditure on policing in recent years. Doing less with more, by contrast, points to the dispersal of resources across wider networks of police and non-police actors (for Innes, this meant communities). It is claimed that drone technology enables 'doing less with more', as revealed in the above interview, insofar as the operation of drones replaces the need for higher numbers of officers who would otherwise be required to attend an incident. The officers being 'replaced' by a drone and its pilot(s) are, in turn, able to be deployed elsewhere in the force area – resources are "kept slack", 'less' resources are expended on that particular incident, and 'more' operational resources are freed up as a result.

This account of technical rationality is consistent with Manning's (2008) criticism of Weber's 'instrumental rationality'. As Manning suggests, 'However, the most important tensions arise, in a contest of rationalities, when ends are not clearly stated, or the ends stated are surrogates, symptomatic, or *displaced from effectiveness*' (Manning 2008: 9, emphasis added). The contestation over divergent ends (cost-savings versus operational effectiveness) points to a representation of the affordances of drone technology within the particular, proximal setting of Unit policing. This perception of value is an important contribution to the evidence-based policing literature as it intervenes in discussion surrounding austerity-era measures such as reductions to police workforces. The workforce of the case study force was demonstrably reduced following the instigation of austerity measures (see HM Inspectorate of Constabulary Annual Assessment 2013/2014 (2014b) for a general overview of average workforces) and the effects of these cutbacks were observed in various ways. Fieldnotes recorded from the early days of observational fieldwork noted the absence of staff at the reception to the field site stations, leading to further difficulties when approached by officers who suspiciously asked why I was loitering outside and waiting for an informant to collect me.[26] In another instance, a member of the public also appeared to be having difficulty accessing a station, and asked if I was a police officer who could assist them into the building. In yet another instance, I (rather naively, on reflection) asked one officer why most of the station was closed off and the lights were turned off in the middle of the day – *"Bloody cutbacks, isn't it?*"

[26] Recalling informants' collar numbers was an especially effective way of 'proving' my purpose and providing a measure of credibility.

(Fieldnotes). Whilst these episodes appear rather mundane, they demonstrate the quotidian consequences of austerity measures, and the necessary relations between drones and austerity policing are brought into focus.

'Cost-savings' existed as a type of abstract, managerialist, bureaucratic concept amongst informants who were generally of lower rank within the organisation. No doubt concerns over cost savings would have been more urgent amongst more senior force staff, especially those with strategic responsibilities for delivering cuts. However, the fieldwork limited its scope only to those informants involved in the routine doing of police work in order to explore how policing was being conducted within this austere environment and not necessarily how this austere environment was produced and managed. Informants were familiar with this issue, but more so in the sense that it was an ever-present backdrop against which their 'real work' was conducted. It was, for example, the reason why their stations were closed off, or why some shifts were over-worked and under-staffed, or why they had not been resupplied yet with refurbished vehicles or personal laptops. In contrast, the end of 'operational effectiveness' was arguably more clearly understood as it related to their sense of what 'the job' required of them. This is an important finding, as it indicates that the proximal, occupational setting into which drone innovation emerged exists within an imperfect structure (which is under-resourced, etc.), but this nonetheless made drone policing possible as informants' perceptions of value subverted these structural constraints. As a contribution to the evidence-based literature, this suggests that the question of 'What works?' does not accurately capture emic values of *how* programmes work within proximal settings, nor does it consider *for whom* and their unique values (see Pawson and Tilley 1997).

Phase II: 'Pre-going live'

The initial 'proof of concept' phase was largely deemed a success amongst programme managers by the time the fieldwork period commenced; programme managers and pilots had effectively demonstrated the utility of a drone capability to the force and the continued existence of the programme was secured, with additional funding identified through the business case. More importantly, the first phase had enabled experiential understandings of the limits to the drone technology in operation during this time. The observational fieldwork was primarily undertaken during this transition into the second phase following the 'proof of concept' and beyond. With the concept proven,

via approximately forty drone deployments being evaluated and analysed for their operational utility, the programme managers moved to procure two identical bespoke drone models in order to 'go live'. Whilst I was unable to gain access to the initial deployment evaluation documents, I understand that these involved the completion of a post-deployment proforma by a pilot. The forms compiled information about the deployment's location, flying time, and an opportunity for pilots to record any benefits or limitations which were experienced, such as technical faults, identifiable deployment outcome, weather conditions, etc.

The bespoke models were procured from a small commercial design and manufacturing enterprise based in the UK. This represents a momentous departure from pre-existing procurement processes by other drone-using forces in England and Wales which principally acquire drones from larger, multinational companies such as DJI (based in China) and Aeryon (based in Canada). Whilst there are benefits attached to procuring drones from larger companies, such as consistency of supply and more abundant product reviews available, there are also drawbacks such as difficulties associated with the customer service provided by internationally based providers and, ultimately, the generic nature of commercially available drone equipment. The ability to design in the needs which were specific to the police chimes with Lawson's (2008: 50) arguments for the Transformational Model of Technical Activity (TMTA): 'objects simply cannot be understood other than in terms of the various activities involved in their design, production or use'. This type of technical activity therefore bears upon what the technical *object* is.

> "Officers break things. They step on them, things break off, they don't put them away properly." Technology needs to be robust to withstand not only the rigours of police deployments in harsh terrain and weather conditions, but also possibly indelicate officers themselves.
>
> [Fieldnotes]

Far from being a completed project, whereby the drone programme was effectively established and could successfully become a force-wide resource, this process of procurement also illustrated that socio-technical systems are continuously evolving. Their structures are transient, so as to accommodate ongoing technical development, and interdependent with the activities of their composite members (see Bhaskar 1998). Early in the fieldwork period, a new cohort of officers underwent training and

qualification as pilots which brought the total number of pilots to twenty-four. This was intended so that there would be two pilots available on each of the five shifts operating from two stations which housed the drones, which enabled (functionally) a 24/7 drone capability. The reasons why drones were not a *dedicated* 24/7 capability are captured in the following fieldnote extract:

> A dedicated drone capability – 24/7 coverage for the entire force – does not seem desirable (at least at this stage) because the programme has been built around the cautious and incremental introduction of drones into the Unit. The drones have been 'slotted into' pre-existing infrastructures to maximise efficiency and cost-savings. Imaging data are stored on the same software programme as body-worn cameras, drone pilots are tasked through the force's centralised incident management hub, and pilots perform their usual Unit responsibilities alongside the drone. The drone does not take precedence over other technologies or techniques of working – as one pilot has put it previously, the drone is 'just another tool'.
>
> [Fieldnotes]

This extract connects with the conceptualisation of drones conducted in Chapter 2, which posited that technologies do not emerge into a vacuum, insulated from the intervening effects of organisational technical rationality. Instead, the very organisational infrastructures of Unit policing, rationalised through technological apparatus such as software management systems, accommodated the introduction of drones. The technical activity of drone policing during this phase was therefore contingent upon pre-existing technical apparatus; a type of 'position-practice' insofar as the drone occupied a place within the technical network but was also imbued with sociality by virtue of the actions of its users and designers/manufacturers during this phase.

Phase III: 'Going live'

The final phase concerns the drone programme 'going live' as a force-wide operational resource. It represents the final state of the programme, its end goal. The following descriptive points about this phase were drawn together from reflections on the fieldwork period once I had left the field. These are based on fieldnote memos and comments made by informants in passing as opposed to data generated from questions specifically asked of informants. This is largely due to the 'going live' phase being unanticipated whilst I was in the field:

- any member of the force able to request the drone via established and efficacious tasking mechanisms (e.g. through the central control room)
- the control room and the Force Incident Managers trained up on the capabilities of drones to support their tasking of drone pilots, enabling seamless joining up of pilot's skills to calls for assistance
- the teething problems and technical challenges being rectified to produce the 'finished', bug-free product
- experienced pilots invested in continuing to develop and hone their skillsets
- possible expansion of the programme through recruitment of new Unit officers and/or the replication of the Unit's programme in other force departments (once I left the field, the Unit began the process of transferring its expertise to the force's rural crime team – a move which had been hinted at for some months prior given the rural crime team's growing interest in drones for its work).

These were just some of the intended goals of the live phase; measurable, achievable, modest, and honest. Towards the 'end' of the pre-going live phase there was a palpable sense of excitement amongst some of the officers – their work and investments into the programme would finally pay off. None of them wanted to see the programme fail. But when officers were asked about their excitement, I was instead met with casual easiness or a detached sense that *"If it works, great. If not, at least we tried"* (Fieldnotes). Whether this summarised how the informants felt as time had worn on and the drone perhaps lost some of its novelty or whether this was a front presented to me to pre-emptively distance their emotions from any possible failure, was unclear.

However, the 'going live' phase was heralded by a rather inauspicious series of technical failures. The first occurred during a public event, an annual presentation put on by the force at the Headquarters. The event showcased some of the force's departments and put on a series of demonstrations of, for example, the dog unit, mock Taser deployments, and what was intended to be a drone demonstration. Instead, one of the programme leaders lost control of the drone mid-flight and crashed it into a tree. The Fire & Rescue Service was on hand to retrieve the drone from the tree, but by then the damage had been done – repairs were needed for the drone and the pilot was left mortified by the failure. This was not helped by the presence of local media outlets who quickly reported on the crash and used a few choice words ostensibly given by

another, non-programme member of the Unit to describe the ineptitude of the pilot.[27] The second crash occurred only days later; an experienced pilot had suffered another technical fault with the other bespoke drone which had, according to several members of the team, "*obliterated*" it on impact with the ground (Fieldnotes).

The 'going live' phase was off to a difficult start which exemplifies the earlier statement to the effect that the transitionary process was generally linear but, more significantly, iterative and piecemeal. Challenges were experienced throughout the process: the lengthy process of designing specific police needs into the drone technology itself and the relationship this engendered between designers and end users; technical faults concerning 'toilet bowling'[28] and issues with the on-board GPS; the perceived negative impacts of the consecutive crashes on the legitimacy of the drone programme amongst others within the force. It felt "*like one step forward and two steps back*" according to programme members (Fieldnotes). However, because the transitionary process is not being categorised here as an exact, discrete movement between stages, there is creative space to explain that despite the failures which plagued the 'going live' phase, the programme had the ability to manoeuvre 'backwards' to a previous state which allowed programme members to learn from the failures of the 'going live' phase and re-address them through further training. Thus, programme resilience was the defining feature of this latter stage. This in turn has implications for the following section on innovation diffusion: the drone programme did not achieve its 'going live' ambitions during the fieldwork period.

6.3 Organisational diffusion

The diffusion process is conceptually and empirically distinct from the transitionary process discussed above. Whereas the transitionary process charted the longitudinal development of the case study drone programme, diffusion registers drone uptake as a cognitive and social process, aligned more closely to the structural conditions of Unit policing and the agency which programme members were capable of exerting within this in order to realise drone policing. Separating out structures from agencies enables demonstration of the transformational aspects of innovation adoption, in which the

[27] In the interests of anonymity, the specific words reported will not be reproduced.
[28] The 'toilet bowl' effect occurs due to miscalibration between the drone's onboard inertial sensors (gyroscope and accelerometer) and compass. The Unit's drone was sometimes affected by this due to magnetic interference emanating from underground metal deposits.

causal powers available to what are termed here 'evangelists' are enabled and/or constrained by their proximal setting and facilitated by this technological innovation (see Lawson 2007, 2008; also Archer 1995; Edwards 2016).

Of evangelists and champions

> "Do you see yourself as a salesman?"
> "[Laughing] Death of a salesman! I suppose so. It's about showing people what the drone can do for them."
>
> [Fieldnotes]

Innovation champions are a key organisational resource for leading change within the police service. With the strategic landscape of policing undergoing significant transformation in terms of dynamic new threats and increasing demands placed upon the service (in a time of significant budgetary crisis), the rhetoric of technological solutionism drives the acquisition and employment of innovative ideas and technologies (Association of Police and Crime Commissioners and National Police Chiefs' Council 2016; Deloitte 2018; College of Policing 2020). In turn, the employment of innovation requires people who can manipulate the resources available to them, whether political, organisational, material, etc. in order to make the programme work (see Pawson and Tilley 2004). In critique of hard technological determinism, the soft stance adopted throughout this thesis dismisses claims that innovations automatically appear and subsequently change everything around them; they are instead highly social endeavours subject to enabling and constraining factors. Because programmes enter into open social worlds, characterised by interdependent enablement and constraint, Pawson and Tilley (2004: 4) identify 'four I's' of programme success: (i) *individual capacities* for implementation; (ii) *interpersonal relationships*; (iii) *institutional* commitment; and (iv) surrounding *infra-structure*. Whilst the 'four I's' provide a neat means to delineate between different levels of analysis (see 'research map' Chapter 4; Layder 1993, 1998), these must not be treated as mutually exclusive. Instead, the notion of techno-evangelism is the common thread which weaves between these components.

Evangelism is evident in police policy rhetoric as 'championing' innovation. It sheds some of the zealous connotations of evangelism, but the underlying principle of advocacy remains somewhat consistent. It also strips evangelism of another, more deleterious connotation: martyrdom. Champions are supported by wider

organisational processes which seek to mitigate against innovation failure. The force's representative workforce strategy, another type of innovation programme example, highlights the promotion and training of 'diversity champions' supported by human resources and staff support networks to foster colleague engagement with the diversity programme, formulate goals, and to ultimately empower colleagues from diverse backgrounds. Martyrdom, by contrast, could see champions who fail *because* the supporting infrastructure is lacking achieve an elevated status or prompt backlash if the innovation was deemed a positive one. In Henry's (2002: 172) study of American Compstat innovation, the following was claimed regarding the role and importance of what are (problematically) termed 'heroes': 'The police agency must actively exploit the possibilities made available to them through heroes, who can influence others in a way that mission statements, policy statements, and the lines and boxes of an organizational chart simply cannot'.

I pursued the notion that the drone programme had been driven by powerful evangelists through interviews with two pilots of lower ranks who had newly qualified as pilots only several months prior. This level of experience and induction into the programme enabled insights into how the programme had recruited its members, how members had initially perceived the programme, and to what extent their perceptions had changed since becoming qualified and gaining experience with using drones (if at all). When asked what had attracted these informants to the drone programme (to become pilots), the following responses were given:

> I like technology […] I've always had an interest in anything to do with technology. I love a good course, anyway. It's just something I'm interested in doing, it's something I thought, 'oh yeah I'd enjoy that, I can see the benefits of it'. I can see the benefits of it operationally, I can see us using it an awful lot when the project is up and running.
> […]
> The new [drone] is here, so obviously they're just testing it now, putting it through its paces, ready for a sort of a live, to come out of the project phase and for it be a deployable thing ready to go. So I think it's the way forward and I want to be part of it.
> […]
> Yeah, no I am confident with it, yeah. I'm struggling to see many drawbacks. There will be some, no doubt, but they're not gonna be any more so than what we have with NPAS. Which is our alternative. And obviously they do a great job and I'm not … it's just they're not as deployable as they used to be, they don't come out to lower level stuff, which is fine. But we are missing

> opportunities to arrest people, to find people, and I think that the drone in general will bring some of that back. So that's my thoughts.
>
> [Interview, pilot]

> Right, so I recently – only very recently – completed the course with the [training group]. It was put out for us to see who was interested. From my point of view, I like my gadgets, I like my technology. […] Yeah so it was put out, who would be interested, and I'd had a little bit of an input from other drone users who had done the course the first time around. And I thought 'yeah, that's quite an interesting project to be on'. So I put my name forward and I was successful, because we had two from each shift. So myself and a colleague were successful, there was a lot of pre-reading to do before the course which was very heavy, very intensive, which we completed.
> […]
> We had an email recently to say it's [date] I think we're going to go live with it. So yeah, roll on [date] really. It'll be good. As and when we can get things working with the equipment aspect, yeah, I'm really looking forward to it, I must admit. Because it's something new, it's nice to be part of something new isn't it?
> […]
> Because you can be sceptical with certain things but ultimately I think, certainly after day one, I thought 'no, this is a good bit of kit and this will definitely be used'. And the good thing is we've got some cracking trainers with it, chief pilot, the safety officer, [name] that's on board with it up to the Inspector as well, and they're all very enthusiastic about it, which is great. So yeah, really looking forward to it.
>
> [Interview, pilot]

These interviews raised a series of prominent orienting concepts and set the parameters for further observational work (to be explored below and in Chapter 7). Most notably, the pilots explained their interest in the drone programme and their enrolment within it in terms of the attractiveness of drone technology. This was supported with references to the *"cracking trainers"*, the appearance of a coherent programme plan which pilots can rally around, and the perceived benefits of drones over alternative air support via NPAS. This latter reference was consistent with the arguments put forward in Chapter 5. Of interest, however, is the inherent interest which drones held for these newly qualified pilots and their perceptions of the drone programme. The role of the evangelists, identified in the above interview extracts as *"chief pilot"*, *"safety officer"*, and *"Inspector"*, and wider recognition that this is *"the way forward"*, appears to explain their attraction to the drone programme.

Distributing drone technology

Technological emergence is an inherently social process mediated, as this study posits, by the intervening effects of occupational-cultural and organisational context. In line with Lawson's (2008) TMTA, technical objects become imbued with social values – the technical activities enabled by drones simultaneously give the drone its position within a social context. This becomes more acute in the context of policing, which has generally been described as a deeply symbolic occupation (Shearing and Ericson 1991). How, then, these symbols become inscribed into an innovation, and how these symbols assist (or hinder) its diffusion within the organisational setting, will be the present focus.

In terms of the relationship between drones and policing it can be suggested that technological innovation requires the coalescence of willing and capable leaders with the vision and organisational resources to translate a concept into an operational reality. Within the policing context, it has been argued that technologies diffuse within the organisation in gradual increments, led by pioneering individuals (so-called 'evangelists') with the influence necessary to pursue an innovative programme (Skogan and Hartnett 2005). It has been observed that the British police service can oftentimes be resistant to change, given a prevalent cop culture which 'often sees promising ideas rejected because they were "not invented here"' (Innes 2013: 7). Within the Unit the drone had been met with a degree of resistance (to be explored further in Chapter 7), although the argument that this resistance was led by a rejection based on the drone's external origins appeared incongruous. The previous analysis of the transitionary process has demonstrated the ongoing, sometimes problematic, features of an emerging programme, replete with technical setbacks and so forth which were described as *"taking one step forward and two steps back"* (Fieldnotes). Discussion now turns to the evidence relating to the pattern of the distribution of the technology as it diffused throughout the Unit, powered by the so-called evangelists.

Prior conceptualisation of organisational diffusion pointed to the potential explanatory mechanism of how technology 'fit' with organisational tasks (Goodhue and Thompson 1995). 'Task-technology' fit was applied in conjunction with Rogers's (2003) classic conception of innovation diffusion as a cognitive process as well as how technologies are 'framed' or understood within organisational settings (Orlikowski and Gash 1994, in Lum et al. 2017). Based upon the analysis of the transitionary process, further literature scanning was required in order to understand this non-linear

diffusion process. The so-called 'S-shaped' curve is commonly deployed in studies of innovation within organisational settings (Grübler 1996; Rogers 2003; see also Skogan and Hartnett 2005). This model indicates that diffusion of an innovation follows a non-linear course. Figure 2 below demonstrates the S-shaped curve; the X axis indicates the diffusion process over time, the Y axis is a measure of the extent to which an innovation becomes 'saturated' (e.g. quantifiable number of adopters of the innovation, how many pieces of innovative technology are in use, etc.). The model also indicates three phases of innovation diffusion: initial growth of saturation rate; rapid increase in saturation as diffusion takes hold and the rate of adoption accelerates; and a final plateau whereby there is high saturation.

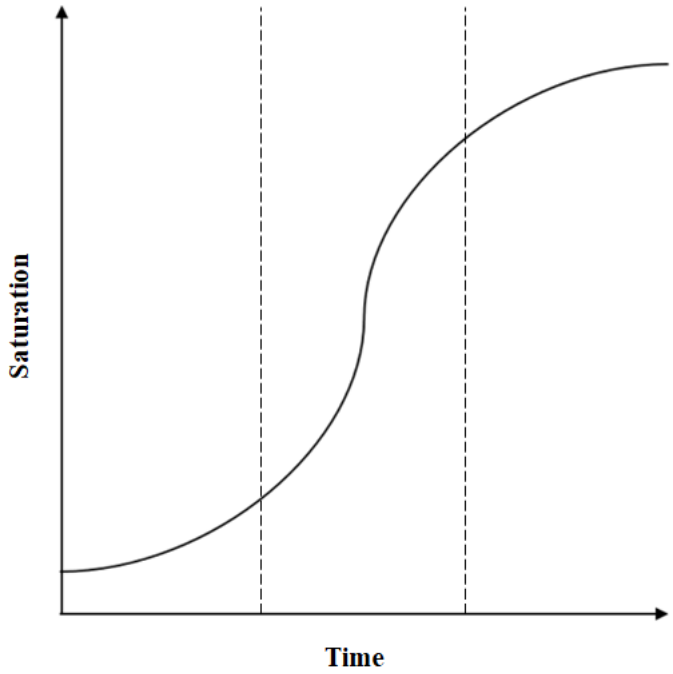

Figure 2. *S-shaped curve*

In the context of the drone programme's transitionary process, however, the S-shaped model of diffusion requires a revision. Figure 2 does not, for example, capture the intricacies of each stage of the diffusion process – the setbacks, the successes, the barriers which were overcome or forced an alternative route to be sought – as previously discussed. The diffusion process should therefore not be seen as an absolute measure, whereby drone technology came to be fully 'diffused' or saturated in terms of absolute usage and spread throughout the organisation. The S-shape essentially does not capture how the programme transitioned between the integral three 'moments' and

the accompanying challenges along the way. It is therefore possible to reject the S-shape as an appreciable means to understand innovation diffusion in this context.

In response to this rejection, the diffusion process was instead analysed in relation to the 'craft' of policing; evangelists draw upon the resources of their craft in order to promote the innovation, recognising in it some benefit or at least a connection to their craft. The following interview extracts are taken from the initial 'conversations with a purpose' conducted with leading members of the drone programme. As discussed in Chapter 4, these initial interviews were significant for the generation of emic orienting concepts (Layder 1998) which enabled the generation of practically adequate knowledge for purposes of evaluation research (Sayer 2010).

> This was three years ago. I realised I was watching something on the TV […] in relation to the drone. And I thought, 'that would be good for policing'. Where I was a Bronze Commander for public order and for other operational roles including CBRN [chemical, biological, radiological, nuclear], search and other activities within [force]. And I thought this would be great for us to use in that role. I then started making contact with several people to see if anybody was using them, I found another force […] had been using them since 2007 […] so we were already eight years behind the force that had been using them. So I realised then, I thought, 'I wouldn't mind looking to see what benefits this would have for [force]'. So I went to a couple of presentations, conferences, to see where it's working that was working with other forces abroad and the UK and then I put a business plan together with the idea that, from my own perspective on an operational side, is that we would use it for any crime within our own locality.
>
> [Interview, programme manager]

> I didn't know the Boss had gone for it. […] [Boss] was telling me about what he was doing and I hadn't been greatly aware of it but it was through him he started talking about it and my imagination just went on from there is that there's no limits to the drone. You could use it in everything and I think he liked what I was saying, we've always worked closely together anyway and we respect each other greatly. […] I think he thought he'd like me on board and I thought I want to be part of his, and that was it. And then once I got into it the more I liked it the more I wanted to be involved but … I dunno what the wording is for it where you start off doing a little bit and it automatically generates more and more work and the more work you do it generates more and more […]
>
> [Interview, programme manager/pilot]

The most prominent orienting concepts to emerge from these extracts were the drivers of institutional isomorphism, the linking of technological innovation to specific

operational needs, and the relationship between drones and localities. A cross-sectional or multi-case study may illuminate the presence (or perhaps lack) of institutional isomorphism,[29] but given the parameters of the present study, and the justifications given in Chapters 3 and 4 concerning the value of single-case qualitative evaluation research, it was possible to nonetheless view this concept as a significant one to the development of the drone programme. The analysis is therefore practically adequate in the sense that it holds relevance both for organisational learning (Weiss 2000) about the origins of the force's drone programme, and as a conceptual starting point for further research (see Pawson and Tilley (1997, ch. 5) on cumulative knowledge in realistic evaluation). As Grübler (1996: 38) suggests, innovations do not diffuse instantaneously; that is, there was a cognitive decision made in the first interview that drones *"would be good for policing"* based on their observations of other forces and, incidentally, the input from a media source. There is also a temporal and 'spatial' element to this, as demonstrated by the second interview, insofar as there was a delay between the idea being communicated between the eventual leaders of the drone programme (Grübler 1996: 38). *"I didn't know the Boss had gone for it"* suggests that the diffusion process was initiated from an 'innovation centre' and then taken up further by an interested actor at a later time.

In adapting Grübler's (1996) model there was a distinct non-linearity to the diffusion process – terms such as 'innovation centre', for example, indicate that innovations diffuse outwards from a central point, expanding their reach over time as they gradually incorporate new supporters, acquire resources, and thus gain momentum. In the case of the Unit's drone programme, however, it is important to consider the external hierarchical organisation of policing, which necessarily entails a sense of 'linearity' in the sense that the resources available to innovators are oftentimes interdependent with their rank, which confers a series of resources to draw from. Seniority and authority over the lower ranks, for example, could enable innovators to recruit more members to the cause through a lawful order or instruction. A higher standing within the organisation could plausibly result in an innovator's ideas being considered more thoroughly by senior staff, enabling access to economic backing and political support. Seniority could also be related to past successes with other

[29] Sociological isomorphism explains similarities between organisations (see DiMaggio and Powell 1983).

innovative projects, which could in turn attract others to the cause who are more likely to gather around an innovator with a proven track-record.

6.4 Discussion

This chapter has presented empirical findings based on interview and observational data regarding the transitionary process of drone diffusion. It demonstrated that the process of diffusion was piecemeal and beset by technical malfunctions. In this respect, it could not be considered that the drone capability achieved its intended role as a force-wide resource ('going live'). Similarly, the chapter addressed an interesting and initially unanticipated facet of drone diffusion: the role of so-called evangelists in championing the innovation and propelling the programme forward, maintaining momentum in the face of technical setbacks as well as the disquiet expressed by those within the Unit and their apparent resistance which was alluded to. It is important to note, ahead of Chapter 7 which explores this in more detail, that those resistant to the changes wrought by drone innovation were not luddites (due to the Unit's original designation as a Roads Policing Unit and the suite of technical and specialised skills which required a considerable degree of technological proficiency and engendered a specific interest in the technological aspects of what was termed 'real' policing).

What this chapter has therefore demonstrated is that the process of innovation uptake and deployment is replete with technical challenges. It is from this finding that further substance is added to this thesis' claims to the distinction between the social and the technical within socio-technical systems. The drone programme began life as a concept, something which was recognised to be appropriate and helpful in certain operational contexts. That the drone was able to positively identify a body during its first deployment seemed to cement this view and chimes with Goodhue and Thompson's (1995) task-technology fit theory. The relation of the social to the technical was therefore conditioned by the operational requirements of policing. However, as time wore on and the programme expanded its personnel and gathered more organisational resources in the form of a (generally well received) management team, the programme continued more erratically. In this way, we can see how the place of drones within policing can be affected by its limitations and liability to fail.

The initial proposition was therefore generally consistent with these findings. However, an important caveat to it was that organisational enrolment is only a partial,

admittedly socially deterministic way to interpret change within a police setting. In order to explain the emergence and maintenance of drone policing as an operational asset, the refined proposition suggests that: Drone technology must enrol within an organisational structure which enables and sustains innovation. *Evangelists were key players in promoting and nurturing the continued existence of the programme. Furthermore, the technical limitations and liabilities of innovative technology disrupt the 'fitness' of drones to required operational task requirements. Only through perseverance by programme members was the programme's continued existence secured.*

Chapter 7: Sub-cultural 'enclaves'

7.1 Introduction

Conceptualising drone policing as an emergent socio-technical system illustrates the mutual shaping effects between the material object and the social contexts into which it enters. The previous two chapters have demonstrated how drone policing addressed shortfalls in nationally provided air support through a local innovation programme and how it diffused within the organisational setting by overcoming technical barriers, respectively. This chapter now explores the shaping effects between drone technology and the prevailing occupational sub-culture of the case study operational support Unit. In so doing, it provides evidence of a burgeoning 'transformation' which was taking place within the Unit which was simultaneously sustaining and disrupting the norms, values, and symbols which defined it. The chapter begins from the following proposition:

P_3	Occupational members must attribute drone technology with socially significant meaning for it to be valued as an operational tool. This meaning is informed by prevailing occupational-cultural frameworks.

Drone policing is therefore viewed as a cultural phenomenon as much as it is an operational one. In order to 'work', drone policing must be compatible with the norms and values of Unit policing. Tensions however rose during the observational fieldwork period concerning this proposition. Drone policing was more controversial than initially anticipated. It had to compete with a strong sense of mission – one oriented toward kinetic action (Reiner 2010) – which was at risk of significant disruption with the introduction of a drone capability. The cultural relationship to emergent drone technology and how, within the case study context, this mediated perceptions of and attitudes towards innovation are therefore the foci of this chapter.

This chapter is different to the other findings chapters because it demonstrates a significant adaptation to the initial proposition (Layder 1998). P_3 was not rejected but rather required additional conceptualisation and the consultation of new literature in order to empirically specify. The tension pivoted on the competing (though not incompatible) notions of 'real policing' versus 'drone policing'. As such, Star's (1989;

Star and Griesemer 1989) conceptualisation of 'boundary objects' was incorporated into the data analysis. Developing Star's concept, the novel idea of 'enclaves' is offered as a means to understand how objects can cause friction *within a clearly defined communit-y* as opposed to *between communit-ies* of practice.

7.2 A measure of success

As the transitionary process from 'proof of concept' to the 'going live' phases demonstrated in Chapter 6, the diffusion of drone innovation within the case study Unit was recursive, iterative, and piecemeal. The analysis initially focussed on the proximal organisational setting into which drone technology emerged and the types of technical challenges which were experienced and rectified throughout the process. This culminated in the conclusion that the technology had been 'police-proofed' through the co-operation between the end users (police drone pilots) and the drone designer/manufacturer which provides a useful means for understanding how drone technology was shaped by the needs of its users. Analysis now turns to a separate but related element of this proximal perspective on innovation diffusion by exploring the ways in which drone innovation behaved as a so-called 'boundary object' (Star 1989, 2010; Star and Griesemer 1989) within the community of practice of the Unit. It argues that the boundary objects concept is a critical framework for understanding the sub-cultural controversies which surround innovation and provides an empirical corrective to Bayley's (2008) proposition that police innovation is not 'self-generated' nor do innovative ideas emerge from the 'bottom-up', amongst the rank-and-file. As the data will show, drone innovation was largely generated from within the Unit by proponents of the drone programme who were generally of lower rank. Inputs and strategic oversight by more senior ranking staff, especially by an Inspector and a Sergeant who acted as programme managers and key evangelists (see Chapter 6) and more distal strategic direction and institutional support provided by a force Operational Lead and successive force Chief Constables, co-existed with the actual operational 'doing' of drone policing by the more numerous lower-ranking constables. However, 'lower ranking' is not synonymous with 'less experienced'; the drone pilots of constable rank enjoyed considerable freedom during the working day to practise their drone flying skills which served the dual purposes of maintaining the two hours every three months

flying requirement for their qualification and for building confidence with the equipment and sharpening their proficiency in a non-operational training environment.

What was occurring instead within the Unit was a significant programme of innovation which was primarily self-generated amongst those involved with the programme. Rather than drone innovation coming from 'outside-inside' and 'top-down' (cf. Bayley 2008), the process was primarily undertaken by those with a proximal occupational attachment to drone technology during their workaday routines. This attachment was initially proposed to be explainable using Goodhue and Thompson's (1995) 'task-technology fit' theory; a cognitive approach to understanding how and why innovation uptake may or may not fail under specific occupational conditions. The theory articulates the linkages between innovations and their 'fitness for purpose' for achieving portfolio tasks; the better an innovation 'fits', the more likely it is to enjoy continued use and, potentially, diffuse more fully within the organisation. Despite its important cognitive contribution to the study of innovation, task-technology fit offers only a rudimentary framework for analysis which is largely concerned with a measurement of the extent to which organisational outcomes are met through innovative technologies (see Ioimo and Aronson 2003). This outcome focus was superseded by another question tied to the third proposition: how was success measured?

Re-orienting around the fundamental issue of programme 'success' introduces a normative dimension to the analysis. How is success measured? What does success mean? What is implied when discussing success in relation to its opposite, failure? What are some of the barriers to programme success? Following the discussion in Chapter 3 and 4 regarding the mechanics of police research, I was cognisant that pilots might think of me as monitoring/evaluating their performance and acting as a 'spy' on behalf of the programme managers who had acted as gatekeepers (see Reiner 1978).[30] Overcoming this potential perception of me as spy, not researcher, formed a considerable part of the early access negotiations with informants and informants were reminded that I was not 'reporting back' to others within the force. Although I cannot be certain that informants did not retain a feeling that this might be the case (on several

[30] Relatedly, I discovered that one officer not involved with the drone programme had thought I was working on behalf of "[professional] standards". This illustrated the importance of identity management in fieldwork settings (Hammersley and Atkinson 2007) and the difficulties of communicating research purpose to the many staff which are tangentially related to a study within a large organisation.

occasions I was asked not to record certain data if the data involved mistakes an officer had made using the drone), their continued involvement in the study and the scope of observations I was able to make provided a measure of reassurance. Crucially, I was able to retain critical autonomy over the reporting of findings.

It also introduces a substantive dimension which expands upon the causal relationship between 'fitness' and 'outcome'. There is some missing 'connective tissue' between this linear relationship which was revealed during the course of the fieldwork: success was a complicated measurement which was not directly related to the 'outcomes' of drone policing, which might usually be recorded in terms of crime prevention, detection, and so forth. The substantive dimension led the analysis away from a strict outcome measurement and instead towards understandings of the meaning-making which goes into the drone programme itself; how different groups within the Unit and force at large coalesced around the drone, the types of controversies drone innovation gave rise to in relation to the Unit's prevalent sub-culture and ways of working, and the negotiated dimensions to making the programme succeed.

Translation across boundaries

Boundary objects come in a variety of forms – artefacts, ideas, repositories, ideal types, standardised forms – and occupy a shared space between heterogenous communities of practice (Star 1989; Star and Griesemer 1989; Fox 2011). They are interpretively flexible, meaning that they may mean different things to different communities, and are an 'arrangement that allow different groups to work together *without consensus*' (Star 2010: 602, emphasis added). In the absence of consensus (controversy), a boundary object can facilitate cross-community working by providing a shared vocabulary, providing opportunities for the resolution of controversies, and develop knowledges across working groups. The crux of the boundary objects concept lies in its role in 'translating' ideas, knowledges, and working practices which can in turn facilitate productive working relations in the light of an innovation (Fox 2011: 72). Boundary objects are therefore

> plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use, and become strongly structured in individual-site use. These objects may be abstract or concrete.
>
> (Star and Griesemer 1989: 393)

There are limits to how 'plastic' drone technology can be and instead it is more likely than not to retain its robustness regardless of the individual use-site (operational context) within which it is deployed. Drone policing as a distinct mode of doing police work is closely aligned with its potentials, meaning that it is more useful for augmenting tasks which require, for instance, an aerial vantage point for data capture. Its abstract elements, devised in Chapter 2, capture its potentials which are bound up in the technical design of the drone equipment – (i) extending of police capabilities through remote and aerial means; (ii) colonising and permeating space to enhance police control and provide a vertical vantage point; and (iii) collecting data through sensory functions of image capture for a variety of crime and non-crime related purposes. The realisation of these potentials (its concretisation) are however conditioned by specific contextual factors. Drones are (rather obviously) better suited to tasks which require aerial data collection or the projection of police presence over outside space rather than other tasks which fall within the police omnibus of responsibilities such as dealing with domestic complaints; providing mental health or medical assistance; or facilitating restorative justice 'conferences' between communities, offenders, and victims, to name only a few. Heavy rainfall or wind might force a drone to the ground or make flying impossible. Flying in urban conurbations carries risks of collision with power lines, buildings, or the many other obstacles which comprise built-up areas. Technical limitations to the drone's on-board camera system such as its zoom function can hinder the adequate collection of, for example, a still image of a suspect. There are other, social, contextual conditions which shape the realisation of drone policing beyond the capricious challenges of weather and operating environment or the technical flaws which highlighted the need for 'police-proofing' the equipment (see Chapter 6).

The following section explores the Unit's idiosyncratic norms, values, and symbols (its occupational sub-culture, see Paoline 2003). It demonstrates that the Unit's prevailing sub-culture, which was observed and experienced throughout the fieldwork period (and the analysis of it continued after leaving the field), promoted a series of broadly consistent characteristics which revolved around a deep-rooted sense of mission. The sense of mission is a central normative concept in the police literature (Reiner 2010) because it goes directly to the heart of the police role and how its members make sense of it, engage with it, and reproduce it. Unit members embodied

and portrayed their sense of mission which was ostensibly shaped by the portfolio responsibilities of the Unit in its operational support role, which were:

- Taser
- Roads policing
- Advanced method of entry
- Search
- Public order and Police Support Unit (PSU)
- Drones.

7.3 (Re)presentations of policing

The original boundary objects concept (Star and Griesemer 1989) was devised as a means to understanding how a variety of communities of practice – amateur naturalists, professional scientists, administrative staff, sponsors – worked together to form Berkeley's Museum of Vertebrate Zoology in the early 1900s. It has since been developed to understand the manner in which certain technological innovations behave as boundary objects in the facilitation, propagation, and resolution of controversies which surround them (Fox 2011). Translations about controversies – which are indeterminate – rely on the (however temporary) efficacy with which cooperation can be negotiated with the ultimate goal of establishing an 'obligatory passage point' through and from which flow a fixed meaning about the problem at hand (Star and Griesemer 1989: 390). Star and Griesemer's (1989) model is influenced by the translational work of actor-network theorists, especially Callon (1986), who proposes a model for understanding how controversies between multiple actors become narrowed into a singular passage point (termed *'interessement'*). However, they adapt this narrowing procedure by instead offering a 'many-to-many' map which instead recognises the indeterminate and temporal nature of multiple translations which co-exist.

The indeterminate nature of multiple translations ('n-way' in Star and Griesemer's terminology) and the many-to-many mapping in turn provokes power considerations; namely, how certain translations come to flourish and dominate others, as well as epistemological questions surrounding which translations are to be researched and presented. As a matter of methodological practicality, contact with Unit officers outside of the drone programme was limited meaning that the

perspectives of programme members (as primary informants) were given empirical and epistemological primacy. Any contact with those outside the programme was usually incidental during the course of observations and the considerable 'downtime' which occurred in various station houses. Therefore, there is an epistemological bias inherent to the analysis due to its preponderance towards the standpoints of drone users and how drone users themselves navigated the boundary between the drone programme and the rest of the Unit. Rather than viewing this as a limitation to the analysis, such a 'bias' instead offers a rich source of data for understanding how the drone programme was turned into a boundary object and, subsequently, an obligatory passage point from the perspective of those who were most closely involved with it. No claims are made to the power of the drone programme to 'dominate' over other translations of Unit policing; it is more fruitful to consider the work which goes into the formation of the passage point and the types of negotiations which take place to determine the level of programme success.

In contrast to the original boundary objects model, drone policing represented controversies within a differently heterogenous communit-*y* of practice which was bound together and defined by its occupational portfolio tasks as well as a contradictory Unit sub-culture which was simultaneously enduring/static and malleable. It was enduring because Unit members advocated and embodied a particular worldview; one borne out of the specific portfolio tasks performed by the Unit in its operational support role. It involved a deep-seated sense of mission which gave importance to the 'doing of' policing which in turn promoted a simultaneous recognition of the mundanity of most police work (Phillips 2016) which was interspersed with episodes of high intensity, 'kinetic' work usually involving one or more technical apparatus. As previously discussed, the Unit's existence was the result of a recent force-wide restructuring initiative which saw the Unit localised within defined geographic areas of the force area. The Unit provided operational support to local policing teams which are responsible for neighbourhood operations in a specific geographic portion of the force area and supported by a Criminal Investigation Department. Moreover, the Unit was originally designated as a roads policing unit, meaning that many of its members still held certain views on the efficacy of fast driving and vehicular response. The combining of this original tasking with new responsibilities (under the umbrella of operational support) meant that roads policing held perhaps a nostalgic but nonetheless powerful symbolic position, with some

veteran officers retaining their Roads Policing Unit (RPU) epaulets on their uniforms[31] and the vast majority maintaining advanced driving skillsets. Unit officers could therefore receive calls for support from a variety of police staff to meet, inevitably, a variety of needs but there was an overwhelming 'roads policing' symbology at work and this mindset suffused the majority of Unit activities: fast cars remained an eminent and practical response tool.

The Unit sub-culture was, conversely, malleable to the extent that the adoption of drones had significant disruptive effects on this worldview. Whilst drones ostensibly coincided with the other technologies used by the Unit, due primarily to their unique specialisation which set them apart technologically from other force departments, such a comparison between drones and other technologies of policing risks eliding the substantive differences between technologies. Again, and in critique of Manning's (2008) argument that the police are a relatively low-tech organisation, drone technology is afforded ontological significance in its own right. The abstract dimensions of drone technology which define it – extending capabilities, colonising air space, and collecting data – confronted the Unit with an entirely new way of performing its tasks. Whilst those involved in the drone programme offered some positive perspectives on drone policing and improvements to efficiency and effectiveness, there was resistance to the innovation by those within the Unit who were not involved in the drone programme. This tension goes to the heart of what was described by informants as 'real' policing; a complex and at-times nebulous concept.

'Real' policing

The first controversy within the Unit sub-culture revolved around the capacious, nebulous, entrenched, and malleable presentation of what informants called 'real' policing. 'Policing' has been described in the Anglophone literature as those activities conducted by an organisation which are generally concerned with: order maintenance; prevention, detection, and investigation of crime; and public protection (Jones and Newburn 1998; Innes 2014b), though more recently there has been a decided shift toward the wider provision of welfare services (Charman 2018). During the observational period, this conventional and formal description of policing gave way to a far simpler one. Whilst concerns over order maintenance and crime prevention

[31] As opposed to the 'Operational Support Unit' (OSU) epaulets worn by others.

registered as salient operational priorities, Bittner's (1990: 249) classic explanation of the core police function of tackling 'something-that-ought-not-to-be-happening-and-about-which-someone-had-better-do-something-now', arguably more accurately captured the operational outlook sustained in the day-to-day. The explanation is conveniently broad and allows some creative space for refining (or adapting (Layder 1998)) it in the case study context, because Bittner did not tie this specifically to illegal criminal acts but rather the omnibus police role (see Klockars 1985). Drone policing is therefore decoupled from a narrow view of policing as crime control. This depiction is also consistent with Brodeur's (1996, 2007) account of 'high' policing which involves technologically sophisticated responses to dynamic and high-risk criminal activities (the ideal-typical crime-fighting trope (see Reiner 1978; Klockars 1985; Graef 1989)) in comparison to 'low' policing which captures the more mundane, day-to-day reality of 'softer' police work (which might involve response to criminal as well as non-criminal events, community support work, and so on).[32] In the case study context, the idealisation of crime-fighting and technological extension and accomplishment of police work was more pervasive than the softer aspects of police work which were conducted by departments other than the operational support Unit.

'Real' policing remained a nebulous concept during the fieldwork period and only after leaving the field (to 'go academic' (Hobbs 1988: 15)) could I more thoroughly reflect on its salience and complexity. As the ever-present backdrop against which the research was conducted it was analytically problematic to attempt to tease out the various components of what made policing 'real'. One interaction with a Unit officer (not involved with the drone programme) stands out on reflection as particularly outlandish and really highlights some of the difficulties I was confronted with when attempting to make sense of the informants:

> Officer: "Where are you from?"
> Michael: "I grew up in X and moved back there a few years ago."
> O: "Oh X!" *The officer sucks their teeth and narrows their gaze. They lean in conspiratorially.* "Do you go to chapel?"
> M: "No, I don't."
> O: "See, that's the problem with people from X. They don't go to chapel."
> M: "Do you go to chapel?"

[32] The College of Policing (2015: 9) analysis of demand on police found that 'non-crime related incidents account for 83% of all Command and Control (C&C) calls'. The abundance of non-crime related work indicates that crime-fighting remains an ideal-typical trope which is sustained amongst some police officers in a 'hyper-real' sense (Baudrillard 1995).

O: “I don’t need to! I’m a police officer.”

[Fieldnotes]

Many officers, once the formalities of access had been negotiated and they were satisfied of my motivations for following them around, claimed that they were *“old school”*, sometimes with few qualifiers (Fieldnotes). For some it meant nostalgia about the Unit’s original designation as an RPU (see the above comment on epaulets): one officer commented that roads policing still accounted for *“90% of the job”* although this claim could not be corroborated given the study’s methodological approach (Fieldnotes). Regardless, it showed how entrenched the RPU mindset was – that roads policing seemed to account for a significantly disproportionate amount of their work, whether imagined or real. For others, it meant doing the job to the best of their abilities; they were *“normal people”* doing a thankless task where *“doing things right”* never gets recognition but doing things ‘wrong’ earned the ire of senior staff, colleagues, and/or the public (Fieldnotes). If the transgression was great enough, officers might court censure. For others still, it was the acceptance that a lot of their work was waiting for something to happen, and even when something did, it was mundane or boring (Phillips 2016). During one call to respond in support of a warrant being executed, blue lights blaring as we sped down country lanes, the officer was more concerned that the job might mean they would not be able to finish their shift on time. The later call to ‘stand down’ was received positively and with relief (Fieldnotes). In the style of a ‘confessional’ ethnographic tale (Van Maanen 2011), I had made the following notes during and after one episode which illustrates the perceived mundanity of police work and the gulf which sometimes existed between informants’ and my own view of events:

> We are sat in the car when a call comes in for assistance – the driver puts on the blue lights and sets off towards the call. I ask, “Is this exciting for you?”. “No, not really”.
>
> I find this difficult to reconcile and, frankly, am unsure of how to interpret this. The exchange revealed a gulf between the informant and me. Driving fast cars with the blue lights on *feels* exciting and so is the anticipation of the potential scene I might witness when we arrive. To me at least. But for them, it’s just ‘the job’. I’m left feeling slightly dejected – that there isn’t excitement to share in.
>
> [Fieldnotes]

Confessional tales were critical moments for reflection not only on the methodology of data collection and interpretation but also the fundamental divide between researcher and researched. The collision of worlds, of values, and of expectations, revealed the very different perspectives each party brings to the event in question.

"Driving fast cars and kicking down doors"

The second controversy concerns the occupational 'fitness' (Goodhue and Thompson 1995) of drone technology within Unit policing and the departure of drone policing from more prevalent techniques and approaches of the 'craft' (Skolnick 1966). The most elegant and visceral trope of Unit policing was put to me as: *"driving fast cars and kicking down doors"* (Fieldnotes). The extent to which Unit officers portrayed their work as distinct from more routine local/neighbourhood policing was considerable, serving an important symbolic function in setting the Unit apart from other force departments. Although animosity or elitism toward other departments were not prevalent during the fieldwork, the sense of specialism was nonetheless pervasive. The boundary between Unit policing and other modes of policing serves the purpose of dividing the labour and skills of force staff, but also hardens the distinctions between what constitutes, from their perspective, 'real' policing as done by the Unit from other policing activities. In one conversation between a Unit officer and a neighbourhood officer, the neighbourhood officer was describing some difficulties with an offender who was now out in the community on probation. The Unit officer seemed sympathetic to the problem, but later 're-defined' the neighbourhood officer's role to me privately as checking in on probationers and *"smashing them"* if they were not complying with the terms of their probation. This was a very specific take on the situation – that the power to intervene against non-compliant probationers extended to *"smashing"* (i.e. a heavy-handed intervention no doubt using the fullest extent of police powers of arrest, detention, etc.).

Of course, this 're-definition' by the Unit officer may have represented a sense of bravado or how the Unit officer *wanted to represent* the activity in question. This is a compelling reflection given the more reactive nature of operational support policing. It raises questions surrounding whether or not an operational support officer is capable of seeing the world of policing as anything other than high-octane and kinetic. What this means for drone policing, when conducted by Unit officers, is therefore significant in terms of how the drone is applied to certain incidents and

whether the idiosyncratic norms and values of operational support leech into the overall direction of the drone programme. Machismo, cynicism, and an action-oriented sense of mission are prevalent themes in the sociology of police occupational culture (see Chapter 2; Reiner 2010).

Skolnick's (1966) view of policing as a 'craft' is therefore illustrative here; Unit policing, although working in conjunction with other force departments, nonetheless imbued officers with distinctive knowledge and skills which shaped their approach to policing problems. There was a prevalence of roads policing techniques, with the majority of officers holding advanced driving qualifications alongside other skills in, for example, Taser and advanced method of entry. Skills were not mutually exclusive and overlapped, as one informant who held highly advanced driving qualifications alongside a drone pilot's license, Taser, and so forth claimed that they enjoyed the variety of the job and the ability to pursue interests and passions, be these in driving or other types of operational support. Achieving the highest driving qualification was an aspiration because those skills could be easily transferred into the job market should they leave the force: "*the next day [after retirement] you'll be getting calls – 'can you do this job; can you do that?'*" (Fieldnotes). Some of the skills which officers can hone during their tenure in the Unit may not be so relevant to employment outside the force (Taser, for example, or method of entry[33]), but many can be highly lucrative on civvy street.

Because of the overlaps between different technical skills held by officers under the umbrella designation of 'operational support' the boundaries between these different skills, reflecting proficiency with different objects, are far more permeable than the boundaries between the communities of practice articulated in the original boundary objects concept (Star 1989; Star and Griesemer 1989). Whilst some officers within and without the Unit might not hold skills in piloting drones, for example, they are able to call on colleagues with those skills through force-wide tasking procedures, the control room, and direct radio contact. It is therefore more productive to view the multiple skills of Unit officers as representing *enclaves* within one communit-*y* of practice rather than as entirely unique and distinct communit-*ies* of practice. Enclaves

[33] Some of the techniques of method of entry involve the use of conventional locksmith tools. When shown the box of tools one officer kept in their car, they told me that they were *"basically a locksmith"*. More kinetic methods using the Enforcer battering ram (the *"big red key"*) are designed for forceful entry and the (legitimate) civilian market for these skills would be limited (Fieldnotes).

inverts the original conception of boundaries between heterogenous communities by indicating, in a technological determinist manner, that drone technology is productive of a new enclave within the Unit (as is the case with the other enclaves defined by other technologies and skillsets) which co-exists, overlaps, and interlinks with others. *A priori* assumptions that boundary objects must cut across such distinct communities of practice are done away with because enclaves are permeable, but the outlines of the enclaves can become hardened when considering the disruptive effects of drone technology upon prevalent approaches to Unit policing which prioritise an action-oriented sense of mission (the sense of 'real' policing), as a result of resistance and criticism, and the recognised need from within the drone programme for mechanisms for learning and addressing failures (these latter points will be explored further below).

There is also an essential, technologically determinist element to the analysis which modifies the original boundary objects concept. The functions of boundary objects portray their active, socially productive qualities within and across communities of practice: communities can 'mould' an object to local purposes (its plasticity); communities can simplify or reconfigure the object to meet minimum needs without entirely altering the nature of the object (its robustness); or communities can work in parallel with one another in the absence of consensus (its weak and strong structuring in different local sites) (Star and Griesemer 1989: 393). This leads to the argument that boundary objects should be divested of their 'thing-ness' precisely because of their interpretive flexibility: people 'act toward and with' an object and its materiality derives from the ways in which it is used between groups (Star 2010: 603). Non-essentialism therefore 'returns attention to the communities of practice, rather than attempting to divine some inherent property of a boundary object' (Fox 2011: 74). This non-essentialism conflicts with the critical realist expansion to socio-technical systems; in particular, the standpoint taken in this thesis that objects are sociologically significant in their own right (Winner 1980, 1986). As an ontological phenomenon combining material object and social context, drone policing represents the concretisation of the abstract dimensions which essentially define drone technology and differentiate it from other technologies. With social constructivist approaches to socio-technical systems criticised in Chapter 2 (Winner 1993), a soft technological determinism bolstered by critical realism is more able to appreciate the mutual relationship between an object and the social contexts into which it emerges.

'Thing-ness' is an immutable part of this view and takes on greater salience when considering the unique context of drone policing within the case study Unit.

The disruption to the sense of mission, which was oriented toward the *"driving fast cars and kicking down doors"* trope, was an apparent cause of the cultural resistance to drone technology amongst other Unit members in the first place, along with perceptions of jealousy over the 'newness' of the technology reported by drone programme members (Fieldnotes). Despite the decision taken not to pursue criticisms of the programme with non-programme members, given the need to adopt 'face saving' initiatives in order to maintain positive relationships with the study's primary informants (programme members), programme members did repeatedly refer to the criticisms which were levelled at them by colleagues. I incidentally experienced such criticism on two separate occasions.

> I enter the station and take a seat at the communal desk. Opposite is a sergeant, arms folded and leaning back on the chair, who welcomes me to the station and the shift. Once formal introductions are out the way, we get down to the real business of an informal interrogation of my being there. I explain the project and that I was accompanying one of the drone pilots on this shift. Not unusual – I had pitched my project many times before. The sergeant seems amused and, with a big grin on their face, asks "So are you here to tell us why the drones keep falling out of the sky?". This elicits a round of laughter from the others in the room; I was clearly in the midst of those who had heard of one the recent failings of the programme – a technical malfunction had forced a hard landing. Word clearly gets around. The pilot who I am accompanying is busying themselves with something on the laptop and shoots me a smirk and a wink. Clearly used to this.
> […]
> The pilot is on the phone with a member of the public calling with further details of a car bump they had been in and is apologetic that they are currently in the pub. They are discussing insurance details in a roundabout way, but keep interrupting themselves and leading off on tangents. The pilot is half-listening and picking at something on the underneath of the laptop on the desk in front of them. They tap me on the shoulder (I'm chatting with the sergeant still) and point to a sticker – DRONE WANKER. I give a half-hearted laugh at this (presumably the correct response) – the pilot just shrugs, rolls their eyes, and carries on with the drunken caller.
> […]
> I feel there is some residual tension in the room between the sergeant and the pilot. Conversation has moved on from the drone. There was clearly no right answer to the question previously asked that would satisfy the sergeant. However, the sergeant seems to present a mild level of interest and begins listing off the films they had seen with drones in them and starts talking about some new-fangled micro drone they had read about that the military was using. The sergeant has warmed up to me somewhat, though I can't escape the feeling

> that I've witnessed a long-lasting criticism which the pilot is confronted with on what must be a regular basis.
>
> [Fieldnotes]

> A group of us are stood in a field near to where we're supposed to start the drone site survey in the search for a missing person. The two pilots ceremoniously unpack the drone from its peli-case and start the pre-flight checks. Problem: the drone had been packed away with a depleted battery. A call goes in to the station nearby – there should be a kit bag with additional batteries in the store room. Sometime later an exasperated officer arrives and ditches the kit bag on the ground. "What the fuck is in there? Probably [programme member's] porn mags or something"
> […]
> With the new batteries equipped the drone begins its site survey. The officer who had newly joined us has been stood by the car chatting with another couple of officers. Immediately, they run over to the drone pilot and begin peering over their shoulder to get a look at the control screen. Four of us are now peering over their shoulder and waiting to see what the camera is picking up. This is the first time two of the officers – including the new joiner – has seen the drone in operation. Some inquisitive questions are directed at me about what we're seeing – black and white thermal images, mostly. Nothing interesting or relevant to the missing person search. Nonetheless, the drone is a spectacle.
>
> [Fieldnotes]

These two fieldnote extracts highlight the ongoing criticism which was more prevalently experienced by programme members, based on comments made to me, but which I experienced to some degree. The first extract highlights how programme failings – in this case, a recent technical malfunction – seem to shade others' perceptions of the programme and, interestingly, that my research could (or should) explain the failing. This was an important extract to reflect on because it provided first-hand evidence of the criticisms which programme members had shared with me and revealed a much deeper, ongoing tension particularly between the pilot in question and their sergeant. This ties into the interview extracts discussed at the end of Chapter 6 on the reasons why pilots were attracted to the programme in the first place – the powerful role of evangelists were prominent features of these. Therefore, I would suggest that despite ongoing criticism levelled at pilots, and especially criticisms led by their immediate supervisors (sergeants), pilots were able to maintain a semblance of positivity toward their new role, taking value and meaning from their like-minded programme colleagues.

The second fieldnote extract is less overt in its criticism – the exasperation of the officer, I knew, was because of their previously confessed opposition to the programme – that it was not so-called 'real policing'. Comments about the *"porn mags"* may have been innocuous or some attempt at humour, but I suggest the context in which it was said is telling. Informants were frequently requested for assistance by colleagues across the Force (hence the operational support role). The rather begrudging assistance given in this case was beyond the norm, especially given that this was in support of a missing person search. I therefore speculated on this point and resorted to a further scan of the technology literature in order to explain how the drone could attract such derision. The subsequent analysis therefore demonstrates the adaptive approach taken throughout this study; data and theory engaged in a continuous dialogue (Layder 1998).

The conceptualisation of drone policing in Chapter 2 explored the extending capabilities of drone technology. It suggested that drone policing could be adequately understood in a straightforward fashion: drones offer causal potentials to extend capabilities, police users appropriate these potentials and deploy drones to achieve some end. This expectation, however, requires adaptation in the light of the unanticipated degree of opposition toward the programme within the broader context of norms and values relating to *"driving fast cars and kicking down doors"*. McLuhan's (1964; see also McGuire 2018) notion of technological extension also revealed how increasing technologisation results in so-called 'amputations'. Technological benefits are accompanied by losses (McGuire 2018: 9). In this case, what was at risk of being 'lost' was the meaning-making and meaning-giving elements of police work which defined identity within the operational support Unit. The initial proposition, that in order to 'work' a drone must complement extant cultural values and norms, was therefore refined to capture the idea that the drone could behave as an 'inhibitory' boundary object (Fox 2011). It was precisely its 'thing-ness' that simultaneously allowed the drone to subvert the need to 'drive fast cars and kick down doors' whilst also attracting derision for that very same reason. Thus, a new enclave oriented around the drone was emerging and caused friction with the surrounding community of practice. It therefore behaved in an inhibitory way because, unlike how boundary objects are conventionally understood as bridges for collective activity, it was not capable of facilitating shared meaning or value.

7.4 Learning and safety

Alongside the sociologically enticing aspects of police culture – its sense of mission, action orientation, conservatism, solidarity, etc. – is a pervasive and pernicious blame culture. Waddington's (1999) analysis of cop culture highlighted how these traits can lead to condemnation of the police; that these traits can be used by researchers and other commentators to explain police (mis)conduct. But condemnation can also come from within the ranks which raises important questions: What happens when something goes wrong? How are failures defined, diagnosed, and acted upon? The handling of police misconduct has recently changed in England and Wales with a shift towards more informal recording and resolution of lower-level complaints made against officers with a view to learning and 'Reflective Practice'. The Police Federation[34] has welcomed these changes as it raised the threshold for the definition of misconduct or gross misconduct, meaning that lower-level allegations could be dealt with internally within forces rather than at Police Misconduct Hearings or by the Independent Office for Police Conduct.[35] The Chair of Police Misconduct Committees for West Midlands Police, barrister Douglas Readings, made the following comments on police misconduct hearings: 'From a lawyer's point of view, the police misconduct hearing is unique and interesting. It is both inquisitorial and adversarial. It combines an employer's disciplinary function with professional "fitness to practise" regulation in the public interest'.[36] The move towards Reflective Practice is aimed at rectifying this system which was seen as 'too adversarial for low-level matters' by the Federation.[37]

Despite these recent changes the blame culture still pervades the police organisation and it remains to be seen how the new system will operate in practice. The concept of blame is therefore both a salient occupational, emic trait and also a useful means for exploring how wrongdoing, failure, and poor performance are understood by occupational members. It is worth noting that my role as researcher did

[34] The staff association for police constables, sergeants, inspectors, and chief inspectors in England and Wales.
[35] https://www.polfed.org/news-media/latest-news/2019/blame-culture-a-thing-of-the-past/#:~:text=%22The%20whole%20'blame%20culture',process%20%E2%80%93%20belongs%20in%20the%20past.&text=The%20formal%20misconduct%20process%20should,most%20serious%20of%20cases%20only. [Accessed 12 July 2020].
[36] https://www.judiciary.uk/wp-content/uploads/2019/06/readings-2019-police-misconduct-hearings.pdf [Accessed 12 July 2020].
[37] https://www.polfed.org/news-media/latest-news/2019/blame-culture-change-needs-everyone-s-backing/ [Accessed 12 July 2020].

not extend to a 'monitoring' role of drone use and that it was crucial to convey to informants that I was not observing drone flights with a view to assessment. Assessment of drone flights and pilot competency remained strictly with the programme managers and the pilots would routinely engage in training flights during their shifts to keep their skills up when their workload allowed. Training flights were also recorded in a programme 'logbook' to ensure that pilots were maintaining their flying hours for purposes of their qualification (two hours per three months). Hence much of the observational work was carried out during these training flights which provided insights into how officers, who had self-selected to join the programme, continued to self-motivate and also self-diagnose their competency and identify opportunities for further learning.

The Police Federation and KPMG (2018) examined the police blame culture in comparison to the healthcare and aviation sectors in the report *How do we move from a blame culture to a learning culture in policing?* The report summarised the outcome of a policy dinner held between stakeholders and senior police leaders as well as industry experts from the healthcare and aviation sectors. It touches upon the significant differences in approaches to learning from failures and mistakes between these sectors, and how unique operational contexts, cultural dimensions, and public expectations shape the implementation of responses to these. The aviation sector was presented as an exemplar with regards to learning through failure: investigations into 'near misses' and other incidents through the Air Accidents Investigation Branch could identify the events leading up to the incident, and how such investigations can reveal 'systemic short-falls' rather than identify 'individual culpability' (The Police Federation and KPMG 2018: 3). This should not be interpreted as a move to subvert accountability processes or obfuscate individual liability. Within the European civil aviation sector there has been a move toward principles of a 'just culture', defined as:

> a culture in which front-line operators or other persons are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but in which gross negligence, wilful violations and destructive acts are not tolerated
>
> (Regulation (EU) No 376/2014 Article 2(12))[38]

[38] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0376&from=EN

Open reporting in a just aviation culture shares some similarities with the recent changes to the handling of low-level police misconduct. In promoting an environment of open reporting, where wrongdoers are more likely to perceive the possible consequences as just and fair, it stands to reason that individuals are more likely to be willing to report. Failures can therefore be transformed into opportunities to learn both from an individual and organisational standpoint.

> While warning against the 'narcissism' of police exceptionalism, several attendees drew attention to the intrinsically confrontational nature of policing, that set it apart from other sectors and created the conditions in which conflict and contest are inevitable. It was noted that the extensive powers conferred on the police to take action against individuals without their consent, rightly necessitated a 'fierce' regulatory framework; it was also noted however that regulation in other sectors such as healthcare, was equally strong, and this did not in itself prevent a shift towards a safety-oriented approach.
>
> (The Police Federation and KPMG 2018: 6)

Failure as learning opportunity

As discussed in Chapter 6 regarding the transitionary process from the 'proof of concept' phase through to the 'going live' phase, the latter phase was marred by both of the bespoke drones crashing within a short period of time. The first crash occurred on the day that the programme 'went live' when the pilot lost control of the drone and it crashed into a tree. This incident was dubbed *"Operation Sycamore"* by other programme members (Fieldnotes). The second crash took place soon afterwards with an experienced pilot which had "*obliterated*" the drone, according to one witness (Fieldnotes). The second event required costly repairs which were justified by the programme manager when compared against the cost of a NPAS helicopter flight (see Chapter 5). Both of these crashes provided critical, if not inconvenient and slightly troubling (two consecutive crashes did little for the reputation of the fledgling programme) opportunities for learning from failure. What was to be learned from these episodes, respectively, was consistent with the Police Foundation and KPMG (2018) report on 'systemic failures' versus 'individual culpability' as well as the emergence of a 'just culture' from the aviation sector. It is useful to interpret these data through the lens of the aviation approach to failure in order to identify the convergences between aviation and police cultures.

The first incident – 'Operation Sycamore' – did not reveal in as much depth the potential for learning from failure and the nascent just culture within the programme. Because it was due to the programme manager's fault, I would suggest that this left little room for actual learning, particularly amongst other programme members. To whom did the manager have to justify their failings or be held accountable? How could this be turned into a learning opportunity to demonstrate how at-fault pilots would be dealt with by the management team? (The manager did not refer themselves on to further training or any other penalties as they would have had the crash been caused by another pilot.) In this way, a distinction between management versus non-management members was revealed (Reuss-Ianni 1983). The second incident, however, revealed a series of important questions about handling failure which had not yet been considered in the programme's history.

> The drone was "obliterated" when it crashed into the ground – what was later discovered to be an on-board technical fault had caused the drone to lose control mid-flight and could not be landed safely. The manager was discussing their conversation with the pilot who had offered to "hand in their ticket" and leave the drone programme. The manager did not want this. It was not desirable to have pilots who had failed – even failing as far as obliterating the drone which eventually required extensive and costly repairs – leave the programme.
>
> It led then to other concerns if the pilot had left the programme – what would happen the next time a pilot crashed or damaged the drone or otherwise made a mistake? Would they own up to the failure and use it as a learning opportunity or a chance to re-train their skills? Or would they hide it if there was a risk of censure?
>
> [Fieldnotes]

Whether or not the pervasive blame culture was the reasoning behind the pilot offering to *"hand in their ticket"* is debateable. I left the field soon after this incident and therefore did not have the opportunity to follow up with the pilot. However, it is compelling to consider this as the initial reaction given the preceding discussion on blame and its consequences for programme members. The continuous training beyond the legally required flying time needed to maintain qualifications was dedicated to honing skills and proficiency with the drone equipment. 'Downtime' between calls for assistance was spent practising take-off and landing procedures, teams of pilots would set up slalom 'obstacle courses' by way of cones set out in a pattern on a field to test dexterity and manoeuvrability with the controls, and members of the public were

frequently used as ‘target practice’ for the onboard thermal and optical zoom cameras. Pilots were continuously self-diagnosing their training needs beyond the purview of the programme team. The occasional instances whereby I was requested not to take notes or report on failures were indicative not so much of the concern that the programme managers would censor or penalise pilots. It was a more deeply-ingrained reaction to being seen as underperforming. The questions raised in the above extract concerning the consequences of failure (hiding versus taking ownership, learning from failure or not) returned me to a much earlier observation made at the beginning of the fieldwork period. These incidents are therefore some fourteen months apart, but it is possible to interpret the later findings through the lens of the earlier. The earlier finding (below) describes a story being told to me about a drone deployment which had taken place very recently, but before the fieldwork period commenced. At the time this extract was written, I had not yet begun thinking through the consequences of failure nor had I been exposed to the emergent learning culture for any significant amount of time. As mentioned at the start of Chapter 6, I was more able to critically reflect upon the significance of the culture until I had left the field entirely.

> The pilot has taken me to the site of a previous incident – the drone was deployed from the end of the cul-de-sac to follow a suspect after de-camping from a vehicle. The suspect had jumped the high fence at the end of the cul-de-sac and made off into dense woodland beyond. The pilot had rapidly deployed the drone but soon had to land in order to change out the battery – the drone had been packed away with a depleted battery or the battery was faulty (reason unclear). They go into painstaking detail about exactly how the incident played out. Positioning themselves and pretending to hold the controller, pointing out where the suspect had run off to, and emphasising how overgrown the woodlands had been at the time and the resulting lack of visibility. Amidst the storytelling I don’t quite catch the outcome of the incident. The suspect seemed to have been eventually located by another team on foot; the drone’s role in all of this seemed remarkably unclear. But that doesn’t seem to matter. The pilot is demonstrating how they had operated the drone. The rapid deployment from bag-to-air, the change out of the battery, the fence and the undergrowth. Even how the elderly couple living in a nearby house who had come out to spectate were reassured with a wave. These all seemed worthwhile successes to exhibit.
> […]
> The pilot goes on to reflect on this incident. They point out what they learned in terms of ensuring the batteries are always fully charged and the drone is stored away with charged batteries. They expressed the need for a second officer or observer on hand to keep an eye on where a suspect is running.
>
> [Fieldnotes]

The most noteworthy point from this extract is how what, ostensibly, could be seen as underperformance – the vagueness of the operational utility of the drone, improper pre-flight checks to ensure the battery was functional, incomprehensive site survey to identify lines of visibility – were glossed over. These were submerged beneath the broader representation of the incident as something worth sharing; exhibiting the ability of the pilot to overcome these challenges. Relating this observation to the later one (concerning the *"obliteration"* of the drone), we can see a distinct difference in how pilots reacted to underperformance. The first pilot suggested their voluntary withdrawal from the programme. The second seemed to obscure this through a narrative storytelling device; a distinction between what was said and what was done (Waddington 1999).

A third observation took place during and after a pilot's training examination. The pilot had previously qualified but was required to undergo further training due to failing to uphold the two hours/three-month qualification requirement. The pilot was examined by one of the programme managers and was required to undergo a series of flight tests: a slalom obstacle course, checks on dexterity, take-off and landing procedures, pre-flight and post-flight survey, and a basic regulation knowledge check. The pilot failed the test with a few minor faults and was required to undergo further training at a later date:

> [Pilot 1] sits in the front passenger seat, [Pilot 2] sits in the driver's seat, and I'm in the back. Pilot 1 is dejected and lets out a sigh of frustration. Pilot 2 comes out with "You fucked that". No response. To me – "In the police family, it's normal to take the piss out of each other first". Hand on shoulder, Pilot 2 continues to de-brief Pilot 1. What went well and what went not so well. How some of the faults could have been avoided had Pilot 1 paid attention to the flight information showing up on the controller.
> […]
> Shortly afterwards we're back on the field going through the test again but without the examining manager present. All the points which Pilot 2 had de-briefed Pilot 1 about were re-covered. Pilot 1, confidence slightly shaken, is flying more cautiously and deliberately than before. The constant flow of information and encouragement from Pilot 2 seems to be helping – we stand in the field and go over the faults until both pilots are satisfied with the improvements made.
>
> [Fieldnotes]

This observation adds additional detail to the emerging 'just culture' within the programme. It highlighted how management conducted quality assurance testing

and ensured compliance with the Civil Aviation Authority's regulations on maintaining flight hours. It also highlighted how the programme operated a process of continuous learning and development. Failures were noted and the pilot was given an opportunity to re-take the test once they were confident they could pass. The presence of another qualified pilot to keep up morale and go back over the faults to rectify them demonstrated the collaboration between pilots to succeed.

The stories being told about 'real' policing or 'drone' policing were experiments in subjectivity (Shearing and Ericson 1991: 491). Drone programme members were experimenting with an entirely novel cultural framework with which to interpret and subsequently (re)present their work. In contrast to 'real' policing – tied as it was to action-orientation and a sense of mission intimately connected to the reactive, kinetic elements of operational support responsibilities – drone policing required a new perspective on what constituted their 'craft'. These were all craftspeople in their own ways; as the above discussion on the drone enclave within the community of practice explored, a space was being carved out in which the idea of 'real' policing was undergoing considerable transformation (cf. Star 1989; Star and Griesemer 1989).

On reflection, the three incidents presented above through fieldnotes – the storytelling, the *"obliteration"*, and the failed quality assurance test – each reveal something vital to the continued existence of the drone programme. There are mechanisms presented within this context of a burgeoning 'just culture' within the drone programme cultural enclave. The first mechanism was one of accountability. The crash was not referred on to the Air Accidents Investigation Branch because, as the programme manager put it, *"there's nothing to learn from it"* (Fieldnotes). This revealed the manner in which failings were handled 'in-house' at the local programme level. Referral to the Investigation Branch was deemed inappropriate because referral usually takes place in the event of a significant fault which the wider drone-using community should learn from, or where criminal or civil liability must be determined. The programme manager in this respect acted as a referral gatekeeper, preferring instead to use the crash as an opportunity to consider how censure could risk future incidents going unreported. The second mechanism related to how underperformance or even failures were recognised. Continuous monitoring of training needs and opportunities to re-take quality assurance training highlighted that drone competence was an ongoing process. Keeping skills honed and pilots appropriately logging flying

hours was again handled internally; the notion of ‘justice’ and the importation of these aviation-sector processes speaks to a significant current of change when considered against prevailing cultural norms and values discussed previously.

7.5 Discussion

This chapter has explored nascent cultural transformations within operational support policing. It explored the tensions which arose over the notions of ‘real’ versus ‘drone’ policing. The novel concept of enclaves of cultural practice was offered as a means to understand this tension, implying that drone policing generated its own burgeoning cultural framework. This culture was nurtured through a unique and idiosyncratic learning culture set apart from prevailing norms and values; setbacks and failures were opportunities for development, not censure. This coincides with broader national-level changes to addressing misconduct which bears similarities to the notions of ‘just culture’ within the aviation sector. These were unanticipated findings to some degree. The level of resistance to the drone, and the perceived existential threat to ‘real’ policing which accompanied the drone programme was unexpected. More specifically, the extent to which drone policing seemed incompatible with ‘real’ policing was unexpected. The idea of cultural enclaves therefore goes some way to making sense of this; how in essence a smaller sub-set of the community of practice (the Operational Support Unit) carved out its own niche, replete with idiosyncratic cultural norms and values. In turn, this enclave demonstrated a tentative move toward a more ‘just’ culture; the three incidents of failure demonstrated the types of learning which these encouraged. Moreover, it was precisely the ‘thing-ness’ of the drone itself which caused these cultural shifts. Thus, we see the interactions of cultural context(s) and mechanisms of learning and safety. The implications of this for understanding the relationship of policing to emergent drone technology are profound. It suggests that technological change does not embed neatly nor is it accepted uncritically. The cultural work which needed to be done in order to sustain the drone programme indicates that conventional sociological understandings of policing as being oriented toward action and involving a deep-seated sense of mission (Reiner 2010) can hinder innovation uptake. Seeming cultural pre-occupations with technological solutionism (Byrne and Marx 2011) and the allure of new equipment (Salter 2014) overlook the cultural barriers which were in place.

The initial proposition therefore underwent considerable adaptation. It is refined as: *Drone policing emerges into pre-existing occupational-cultural frames and as such causes tensions between distinct value systems. Its capacity to threaten extant notions of 'real' policing implies that drone policing is a disruptive occupational-cultural phenomenon and therefore requires new, technologically-mediated cultural value systems which recognise best practice and opportunities for learning.*

Chapter 8: Regulation of drone policing

8.1 Introduction

This final data analysis chapter examines the regulatory dimensions of drone policing. It borrows from McGuire's (2012: 28) concept of 'technomia' which illustrates the simultaneous *regulation of* and *regulation by* technology. Drone policing regulates various aspects of social and public life by empowering police to intervene in problems through new, mechanical means. This realises the particular causal powers contained within the drone itself to extend capabilities, colonise and permeate space, and collect data. Drone policing is also regulated through a governance network which draws together a range of governing actors. This is characterised here as representing a particular circuit of power (Edwards 2016). The circuit of power highlights the circulatory, strategic nature of *power to* act which is conditioned by the actions of others. Such a view of power is evidenced in the narratives which surround drone technology within society at large, pointing to a dualism in terms of its capacity to 'unlock' economic and societal benefits whilst at the same time posing existential threats to safety and infrastructure. The emergence of drone-enabled commerce, leisure, and crime will be explored in order to explore the wider drone ecology within which drone policing circulates. More importantly, the data demonstrate that the governance of drone policing occurs most significantly and notably from within the case study Unit itself or, more specifically, within the drone programme. Whilst national level governance frameworks exist to regulate drone operations in civil airspace, such as those frameworks produced by the Civil Aviation Authority (CAA), as well as related governance of police activities concerning surveillance practices, it was at the local case study level which a host of voluntary and innovative regulatory practices were being developed and implemented.

The chapter analyses data gathered via the documentary analysis component to the study (see Appendix A) and is complemented with relevant fieldwork findings. It commences from the below proposition, which will be adapted based on the empirical findings which demonstrate that the regulatory aspects of drone policing switched 'inwards'; regulation was more empirically prevalent in terms of how drone policing itself was regulated by users as opposed to more conventional understandings of how drone policing could regulate the activities of others. In an important

adaptation to this proposition, findings showed that regulation emerged from within local innovation centres, decentring (Black 2001) conventional powers of and over policing, and 're'-centring local programmes as sources of lively regulatory activities.

P_4	Drone policing empowers police to regulate certain aspects of the social world due to the technical potentials of drone technology.

8.2 Constitution of a circuit of power: absent and present power

The conceptualisation in Chapter 2 of drone policing representing an emergent 'multi-centred governance' (MCG) system pointed to some of the conceptual ideas which informed the generation of the initial proposition (P_4) (Edwards 2016). The powers available to drone users are facilitated by the technical potentials of the technology itself – to extend capabilities, colonise and permeate space, and to collect data. The MCG also points out how power circulates strategically amongst so-called rival centres of power; centres acquire drones to empower itself which can subsequently disempower another centre(s).

Whilst Edwards's (2016) conceptualisation of circuits of power directs empirical and theoretical attentions toward the negotiation of power between actors and its socially productive nature within concrete local political economies, the concept requires some adaptation in the light of the voluntary and internal drone policing regulations characteristic of the case study level. In order to adapt this, Deacon's (2012) arguments for *ententional phenomena* are compelling. Ententional phenomena (which speak to the power of absence) are those which 'exist only in relation to something that they are not' (Deacon 2012: 24); therefore, voluntary and internal drone regulations exist in relation to formal and nationally-set regulations. These latter regulations are subsequently appropriated and adapted in the case study context so that the case study drone programme meets and exceeds these in its own way. To borrow a term used in Chapter 6, the regulations themselves become 'police proofed'.

The adaptation to the MCG through ententional phenomena also directs analysis toward the ways in which causal power within the circuit is facilitated through the notable *absence of* the powers of others to act. To illustrate: the disruptive potentials of drone-enabled criminals and other forms of misuse which are likely to

come to pass in the future 'drone economy' are enabled within a context of regulation and police enforcement powers. Whilst in principle such regulatory activities seek to exert power over potentially criminal drone behaviours, such as mandatory registration of *all* drone users as of 30 November 2019, whether or not these are enforced by new police powers is dependent on a variety of complicating factors. Criminals who are likely to flout airspace restrictions and other legal limits to drone flying, such as to cause mass disruption to Gatwick Airport in December 2018 and so forth, are probably unlikely to also register their drone. Registration also opens up opportunities for fraud or wilful omission of necessary information. This affects police power to identify criminal users. And, as will be demonstrated in the discussion below on criminal extensions, evading the law and officers is a remarkably straightforward endeavour given the discreteness of drone equipment. Likewise, as will be demonstrated with regards to the voluntary surveillance management principles developed within the case study programme, these principles developed in the absence of formal rulings. Whilst surveillance principles existed to monitor police practices (to be discussed below), the case study programme decided to exceed these through a 'constant recording' procedure. This was borne out of a perceived absence of effective surveillance regulation; constant recording was a local response designed to enhance oversight within this specific context.

8.3 State narratives of opportunity and risk

Appeals to utopian futures are made in discourses favouring the societal, economic, and securitising impacts of drone and other technological innovations; a governmentality driven by technological rationalisation. Recent commercialised enterprises such as 'smart cities' offer an attractive proposition, and drones are just one of a plethora of innovations swept up in this narrative. The House of Commons report *Civilian drones*, for example, suggests the UK drone industry will add £42 billion to GDP by 2030 and create upwards of 600,000 jobs (Haylen 2019: 38).[39] The range of sectors to be impacted in the near future are vast, including: the public sector, agriculture and utilities, transport, telecommunications, and professional services. A central theme emanating from government bodies is the need to harness the capacity for drone innovation to shape Britain into a modern, competitive, and technologically

[39] Data taken from PwC (2018).

enabled society. Central, top-down, policymaking is therefore gearing towards controlling for risk in a regulatory environment designed to maximise innovation for its economic and resulting societal benefits. In other ways, as was demonstrated in Chapter 5, the capacity for regulating drones is also emerging from below the state within local police innovation hubs. This decentring of regulation (Black 2001) therefore invites argument as to whether drones are exerting a shaping influence on the practices and priorities of policing, as state control agents attempt to keep pace with widespread innovation.

Conversely, other writers seek to capture the liabilities inherent to technologies (see McGuire and Holt's (2017) edited volume). The so-called 'arms races' between crime controllers and crime organisers (Ekblom 2005, 2017) illustrate the potential for those same technologies aimed at producing security to instead *induce insecurity*. As societies become increasingly technologised, the scope and scale of criminal enterprise will only expand. Drones are no exception to this, as demonstrated in the (relatively rare) number of 'signal events' (Innes 2014a), including the disruptions to Gatwick Airport in December 2018 and the importation of contraband into prisons. Therefore, drones impact upon policing not only in the ways in which police operations are conducted, but also the types of incidents to which police respond. One of the arguments proposed by McGuire (2012: 29) is that technology is oftentimes distributed inequitably – it creates 'winners and losers' (Postman 1993) – which can shift power dynamics in favour of the haves over the have nots. In the context of rapidly developing drone infrastructures within the 'smart city', distribution is becoming increasingly more equitable. Drone equipment can present a relatively cheap outlay, according to one informant, meaning access to drones (and their potentially disruptive effects in other, non-economically and -societally beneficial ways) is becoming easier. Moreover, the police service has been identified as the *de facto* lead agency responsible for managing drone misuse, due to a 2016 Memorandum of Understanding[40] signed between the Home Office, National Police Chiefs' Council, Civil Aviation Authority (CAA), and Department for Transport. The recent amendment to the CAA guidance on civil drones (CAP 722) further explains this:

[40] The Memorandum of Understanding can be found at: http://data.parliament.uk/DepositedPapers/Files/DEP2016-0743/160915_MOU_between_DfT_CAA_HO_Police.pdf [Accessed 12 November 2019].

> Our enforcement strategy has recently changed to better reflect the balance of capabilities between the CAA and local Police services. The Police often have greater resources, response times and powers of investigation than the CAA. To support this, the CAA has now agreed with the Police, in a signed Memorandum of Understanding that the Police will take the lead in dealing with UAS[41] misuse incidents, particularly at public events, that may contravene aviation safety legislation or other relevant criminal legislation.
>
> (CAA 2019a: 32)

The vast, multi-sectoral civilian applications of drones convey a narrative of social and economic opportunity within the future of Britain's 'high tech' economy. Accordingly, the number of drones operating in UK airspace is set to reach over 76,000 by 2030, indicating an admixture of types of users employing drones for a range of purposes (PwC 2018). Distinctions must therefore be made between different types of (non-police) drone users. By delineating between the following groups, analytical clarity will be afforded to the understanding of the purposes for which drones are being used, their relative relationship to the police, and the effects that state regulations have on these.

Hobbyists comprise the first group. As of 30 November 2019, all hobbyists were required to register with the CAA.[42] The terms of this mandatory registration involve a £9 annually-renewable registration fee for drones weighing between 250g and 20kg, an online test to obtain a 'flyer ID' which assesses knowledge and safety competency, registration of an 'operator ID', and the labelling of drone equipment with the operator ID.[43] By January 2020, 80,000 operators had registered. Powers of enforcement discussed under the Air Traffic Management and Unmanned Aircraft Bill[44] which were planned to grant police powers to 'land, inspect and seize drones if an offence has been committed and a warrant is secured'.[45] There are also on the spot fines for certain drone offences, including failure to produce correct registration or

[41] The CAA uses the acronym 'UAS' (Unmanned Aircraft System) in reference to drone technology.
[42] There are exemptions to registration. Members of British Model Flying Association, Scottish Aeromodeller's Association, Large Model Association, ARPAS UK, and FPV UK need not register as operators of drones. See https://www.caa.co.uk/Consumers/Unmanned-aircraft/Our-role/Drone-and-model-aircraft-registration/
[43] The legal distinction between 'flyer' and 'operator' is: the flyer is the individual in control of the drone and there is no age limit on this; the operator is the individual responsible for the drone equipment and must be at least 18 years old.
[44] Became the Air Traffic Management and Unmanned Aircraft Act 2021.
[45] https://www.gov.uk/government/news/new-powers-for-the-police-to-enforce-drone-laws [Accessed 24 November 2020].

flouting CAA airspace regulations. These changes will come into effect once the Bill has passed.

The second group is *commercial or industrial* users, which is separated from the *hobbyist* group due to the specific legislation which covers their activities. Commercial and industrial users, including the police, require a license and permission to fly available through the CAA for commercial activities, defined as:

> flight by a small unmanned aircraft except a flight for public transport, or any operation of any other aircraft except an operation for public transport;
> - which is available to the public;
>
> or
> - which, when not made available to the public, in the case of a flight by a small unmanned aircraft, is performed under a contract between the SUA operator and a customer, where the latter has no control over the remote pilot
>   - or
> - in any other case, is performed under a contract between an operator and a customer, where the latter has no control over the operator,
>   - in return for remuneration or other valuable consideration.
>
> (CAA website, n.d.)[46]

The license and permissions regulate activities in line with the Air Navigation Order 2016 and set minimum competency standards in order to maintain it: logging two hours of flight time every three months, flying within the restrictions of the *Drone Code*, are valid for twelve months and subject to annual review. National Qualified Entities (NQE) deliver training and examination to prospective pilots for commercial permissions on behalf of the CAA. (NQEs were later re-labelled as Recognised Assessment Entities in the revised CAP 722B guidance documents (CAA 2019b).) In terms of the rapidly growing drone economy, *commercial and industrial users* will certainly be the vanguards driving such economic and societal change: in 2014 there were approximately 400 commercial operators and by 2019 there were over 5000 registered with the CAA (HM Government 2019: 8).

The third group is *criminal, malicious, or hostile* users which, whilst being a comparative minority compared with the former groups, nonetheless pose significant risk. This group presents risks not only in terms of their illegal uses of drones, exhibited in episodes such as the disruption to Gatwick Airport in December 2018 or

[46] https://www.caa.co.uk/Commercial-industry/Aircraft/Unmanned-aircraft/Small-drones/Regulations-relating-to-the-commercial-use-of-small-drones/ [Accessed 24 November 2020].

the various 'drone gangs' handed down sentences in British courts, but also potential risks to the legitimacy of drone technology within society. Their uses impinge upon the activities of the other groups insofar as drone crimes act as 'signal events' (Innes 2014a), oftentimes gathering considerable attention in news and industry media and generating legal discussions which will inevitably restrict the activities of the majority of non-criminal users. Episodes of drone crime will be explored at the later during this chapter because speculation about this problem prompted a significant and unintended adaption to the thesis' central concern with how drones shape and are shaped by operational support Unit policing.

Societal and economic consequences

In 2015, the House of Lords European Union Committee suggested that the European drone sector was forecasted to produce 150,000 jobs by 2050.[47] More recently, the House of Commons Science and Technology Committee (2019: 21; also Haylen 2019) suggests the UK drone industry will add £42 billion to GDP by 2030 and create upwards of 600,000 jobs (Haylen 2019: 38).[48] The revisions to the forecasted growth potential of the drone industry in only a five year period clearly demonstrates the rapid acceleration of this technology, as well as its potential to significantly disrupt extant industries. Industries already under the influence of drone technology range from the public sector, construction, agriculture and utilities, transport, telecommunications, and professional services (Haylen 2019). Whilst the thesis takes as its central unit of analysis drone technology, the technology is embedded within a broader socio-economic narrative surrounding the future of Britain as a technologically enabled society.

Britain's *Industrial Strategy*[49] White Paper (HM Government 2017), for example, sets out five 'foundations of productivity' aimed at securing Britain's place

[47] See also European Commission. 2014. *Communication from the Commission to the European Parliament and the Council: A new era for aviation: Opening the aviation market for the civil use of remotely piloted aircraft systems in a safe and sustainable manner*. Brussels, COM(2014) 207. Available online at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014DC0207&from=EN [Accessed 7 November 2019].

[48] For the report on which this information is taken, see PwC (2018) *Skies without limits*. Available online at: https://www.pwc.co.uk/intelligent-digital/drones/Drones-impact-on-the-UK-economy-FINAL.pdf [Accessed 7 November 2019].

[49] The *Industrial Strategy* was produced by the Department for Business, Energy and Industrial Strategy, formed in 2016 under then Prime Minister Theresa May.

at the forefront of future industrial development: ideas, people, infrastructure, business environment, and places. Under the 'business environment' strand, a set of partnerships (termed 'Sector Deals') are in place designed to build relationships between central government and sectors defined as strategically important to the future of the UK economy. As of 2018, £125 million of industry matched funding was made available for investment in aerospace innovations – notably 'developing demonstrators of new aircraft (such as drones and other electric aircraft)'.[50] As part of this Aerospace Sector Deal the *Future Flight Challenge* was initiated in 2019 – a UK Research and Innovation (UKRI)-led challenge aiming to 'revolutionise the way people, goods and services fly and position the UK as a world leader in aviation products and markets' (UKRI website, n.d).[51] Alongside the narrative of 'revolution' in terms of service delivery, there is also a semblance of a 'green' agenda:

> Developing these future technologies in the UK can deliver both economic prosperity and major environmental benefits, by further reducing noise and carbon emissions associated with aviation.
>
> Technology can provide an answer to the challenge of reducing the environmental impact of aviation, even as it continues to grow around the world.[52]

Moreover, investments have similarly been made in the wider appeal of technology-enabled city-spaces. The *Flying High* project, sponsored by UKRI and Nesta, and funded by the Industrial Strategy Challenge Fund, establishes a programme of drone applications within so-called 'smart cities'; futuristic cities evoking utopian visions of technological innovations solving urgent societal challenges. Five cities engaged in the project are identified as case studies for exploring societal benefits to drone applications (Nesta 2018: 7):

- Bradford – supporting the fire and rescue service.
- London – delivery of medical supplies.
- Preston – construction and regeneration projects.

[50] The Future Flight Challenge funding competition (2019). Available online at: https://apply-for-innovation-funding.service.gov.uk/competition/471/overview [Accessed 2 November 2019].
[51] https://www.ukri.org/innovation/industrial-strategy-challenge-fund/future-flight1/ [Accessed 6 November 2019].
[52] See Department for Business, Energy and Industrial Strategy blog. Available online at: https://industrialstrategy.blog.gov.uk/2018/12/19/how-aerospace-sector-deal-will-help-develop-flight-technology-of-the-future/ [Accessed 2 November 2019].

- Southampton – delivery of medical supplies on the Isle of Wight.
- the West Midlands – responses to traffic incidents.

These relatively recent developments, in which government-funded initiatives attempt to produce a technological future, belie contemporary historical debate surrounding drone technology. Top-down regulation efforts, emanating from a 'core executive' (Edwards 2016), can oftentimes struggle to effectively manage rapidly accelerating technological innovation (McGuire 2012). The current regulatory landscape is important, conceptually and empirically, insofar as it arguably demonstrates a 'precautionary' tendency (see Wallach 2015). In contrast to the notion of 'permissionless innovation', whereby innovations are destined to proliferate unbridled by the slow pace of bureaucracy, the exercise of precaution indicates a balancing of opportunity against risk.

State level narratives illustrate the powers which circulate between various drone users within civil society and the disruptive effects drones have upon these. The *standing conditions* between, for example, crime controllers and crime organisers (usually defined in terms of their dispositions toward preventing and committing crime) are being altered in new, drone-enabled ways, speaking to the *facilitative* role of drones in producing new *causal* potentials to act for either side.

8.4 Regulatory activities and challenges

In their study of community control over policing in the American Midwest, Ostrom and Whitaker discuss James Q. Wilson:

> James Q. Wilson, for example, believes that the issue of order maintenance and law enforcement in the central city are "of such emotional and political significance" that police are always under political pressure from a variety of sources: "Allowing them to be governed by neighborhoods could only intensify that pressure, putting the police at the mercy of the rawest emotions, the most demogogic spokesmen, and the most provincial concerns."
>
> (Ostrom and Whitaker 1973: 49-50)

Wilson's contributions to the study and practice of crime control have been far-ranging, notably the 'broken windows theory' (with Kelling 1982) which influenced the crime control regime devised by New York City police commissioner William Bratton and Mayor Rudy Giuliani in the 1990s. The above quotation supports the

claim that drone programmes ought to be regulated locally *by police* to the extent that it identifies the disruptive influences of parochial values within communities and the politicking which accompanies community-led regulation. Therefore, re-centring the police as agents of regulatory power disinvests regulation of the so-called 'emotional' aspects of it, as well as limiting the 'demagogic' effects of vocal opponents (and/or proponents) from outside the police. The thesis' case study approach generated rich qualitative data related to the mechanisms through which drone policing was regulated in a single drone programme context. The findings speak to the ongoing national-level discussion on drone risks and rewards by providing a different, practitioner, perspective on how some of the most salient regulatory issues surrounding drone technology are managed at the individual programme level and undertaken by drone pilots in their immediate workaday routines. It also indicates that many of the regulatory activities concerning drone policing are actually *voluntary* and that formal regulatory frameworks appear to fade into the background.

The voluntary nature of drone policing regulation generates a substantial question. Ought police regulate its own drone programmes? McGuire (2012: 93) offers one criticism of UK police 'aerial spy drones' being used to detect and prevent crime and 'how unconcerned control agents have been with providing plausible legitimisations of their enhanced visual power'. This question, and the response to McGuire, is nested within the particular disposition of British policing, rooted in its so-called 'consent' model which seeks to explain how police legitimacy is derived from the public. Legitimacy can explain law-abiding and law-breaking behaviours, adding nuance to otherwise normative understandings such as rational choice theory (Cohen and Felson 1979; Cornish and Clarke 1987).

> Legitimacy is the public belief that institutions have the right to exist, the right to undertake the functions assigned to them, and the right to dictate appropriate behaviour. A legitimate authority has the right to exercise power: it commands consent (a sense of obligation to obey) that is grounded in legality and moral alignment.
>
> (Jackson et al. 2012: 4)

In contrast to rational choice, which is framed in economic rationality where law-abiding and law-breaking behaviours are based on decisions over risk versus reward, this definition derives legitimacy from the relations of power between police and

public. The police 'power to' act, demonstrated in techniques of social control and enforcement of the criminal law, is bound up in the public's consent to be subjected to that power. This is a significant departure from conventional state-centric analyses of power, which present the leviathan state as wielding unlimited power to act and intervene in the affairs of its citizens (Latour 1984; Edwards 2016).

This thesis has so far demonstrated evidence that the internal, local, organisation of drone policing is arguably favourable, as opposed to pre-existing national level arrangements for police air support via the National Police Air Service (see Chapter 5). Yet the differences between nationally and locally provided air support has not yet accounted for the significant role regulation plays in burgeoning localisation: a theme which will now be explored in terms of the voluntary and internal regulation of drone policing.

Extending capabilities

The first abstract dimension of drone policing presented perhaps the most complex area of study as the fieldwork progressed. The regulatory effects of policing which are extended through drones are straightforward: officers on the ground can maximise and project their presence, and gain an aerial and vertical vantage point. However, a single isolated 'signal' event highlighted the nascent landscape of drone enabled crime and how these can provide insight into how drone crime and related legislative/regulatory responses extend policing in other ways. This represented a significant adaptation to the initial proposition which shaped this chapter: that drones allow police users to regulate aspects of the social world. The proposition was initially conceived of as a means to understand the types of practices which are augmented and assisted by drone innovation and was intended to invite analysis about the types of incidents which may (or may not) benefit from a drone presence. This would have served a valuable evaluative function inasmuch as it would have identified exemplary deployments and the outcomes which drones can produce, as well as identify perhaps types of police activities which are hindered by drone deployments. However, the proposition was adapted in the light of an isolated signal event which then led to consideration of other, more high-profile signal events in other areas of the UK and abroad which took place prior to and during the fieldwork period and which are mentioned previously. The revised adaptation therefore captures how the availability of drones can disrupt effective regulation by police; drones enable users to outflank regulation attempts.

The signal event which triggered this shift in focus was elicited during a conversation with one of the Unit's drone pilots:

> We are discussing the forthcoming changes to legislation which would extend police powers over drone related crime and make registration of all drone users mandatory *[as of 30 November 2019]*. They reply that they had recently seen a drone flying over a stadium in breach of the current flying restrictions: "We were at a football match and I noticed a drone flying near us. I first thought it was one of ours, but then I saw ours off in another direction."
>
> When asked what the enforcement options were, the officer shrugs. It was suggested that identifying the flying drone might be straightforward but actually identifying the pilot on the ground is significantly more difficult. I ask: "How would the regulations be enforced?" The officer shrugs their shoulders again, indicating that they did not know. "You could just put it in your pocket and walk away. 'What drone, officer?'"
>
> [Fieldnotes]

This single incident appeared isolated in the context of the experiences of Unit informants; no other episodes of drone misuse were related to me during the sixteen-month fieldwork period. This firstly indicates that episodes are sporadic and not entirely representative of a new paradigm in terms of the changing nature of crime toward more drone-enabled modes (a type of 'master shift' toward new technological means to do crime (Cohen 1985)). It may also indicate that perhaps Unit officers were unaware of the scale and extent of drone misuse in their locality which, based on evidence retrieved from Freedom of Information Act releases[53] between 2016-2019 available from the force disclosure log, *was* more prevalent than perhaps they recognised. Whilst there are gaps in the data available via the disclosure log, due to the nature of these data not being routinely published but rather published upon request, Table 3 below does briefly illustrate the scale of recorded drone incidents.[54] It is also important to note that, at this writing, no charges or convictions have been publicised as having been brought forward; if any action was taken it was usually

[53] In the interests of maintaining force anonymity the disclosure log will not be referenced. Some details have also been omitted, such as specific dates of requests/responses.

[54] The force claims, at the time of writing, a 90% compliance rate with Freedom of Information requests. A series of keyword searches were conducted on the disclosure log: "drone"; "UAV"; and "unmanned aerial vehicle" which resulted in an initial sample n=15. These initial categories were further filtered by request type – i.e. reported/recorded incidents, nature of incident, and any action taken – resulting in a final n=12.

referred on to neighbourhood policing teams or the matter was resolved with so-called "suitable words of advice" but the vast majority of incidents were either "not traced" or "no further action" was taken.

Table 3. *Recorded incidents of drone misuse in case study force, 2013-2019*

Date	***Number of recorded incidents***
2019	Sporadic data available. For April-June there were 20 reports
2018	No data available
2017	28
2016	43
2015	18
2014	2
2013	0

These data indicate that drone reports were relatively low-level and there was not a consistent trend year-on-year. However, they do indicate that reports to police, usually from residents observing a drone flying over their property, were coming into the force and were being recorded in some manner. The point being made is that drone crime and drone problems were present within the force locality, which was consistent with other reports across England and Wales. Regardless of their volume or scale these 'signal events' provide a starting point for theorising beyond the empirical phenomena and considering the nascent role police must play in an evolving threat landscape.

The above fieldnote extract also highlights the so-called power of absence (Deacon 2012) in terms of enforcement options available to the officer recalling the drone over the stadium. In principle, the extension of police powers to enforce drone regulations exists: asking for identification, issuing an on the spot fine, etc. In practice, the reality is far more complex and difficult to police. The discrepancies between the policy and practice of on the spot fines, presented in the Air Traffic Management and Unmanned Aircraft Bill, was at this time debated in the House of Lords, with Labour Lord Savours-Campbell stating the following:

> Offenders will run rings round the law, particularly the kind of offenders that we are talking about.
>
> For a start, we need to ask ourselves: will they actually pay the fines? Let us examine the stats on the payment of fines. I take my source from the quarterly returns of criminal court statistics from England and Wales. In the first quarter of 2018—the last stats period available—47% of fines were not paid within 18

> months. In other words, nearly half of those fines were not paid in 18 months. For many, fines are completely irrelevant.
>
> Are we to further clog up our courts with defaulters? In my experience, after 40 years in this institution, Parliament only too often legislates without any reference to what is going on in the real world. This is a particular example. If we really want to put a block on illegal drone flying, confiscate the equipment—just as we do with other potentially dangerous items, such as knives, guns, illegal drugs and stolen goods. That will concentrate the minds of potential offenders.
>
> Then we have the cost of the items—that will be an important consideration in the mind of offenders—which have the potential to be used for recreational and even commercial purposes. The cost can be anything between £100 and £15,000. I went on the internet today to look at the prices of these drones. They are pretty expensive. Many of the more effective ones cost at least £500.
>
> As I said, confiscation will concentrate the mind. Just ask police officers who know the impact of confiscation. We need to be firm and uncompromising with those who wish to play fast and loose with the law and who are prepared to endanger life by acting in such a way as threatens to bring down an aircraft, intentionally or not.
>
> (Lord Campbell-Savours, Hansard, 12 February 2020: vol. 801 col. 2273)

Lord Campbell-Savours is here relating to the reality of operational policing and the implied flaws in implementing such an enforcement mechanism. Instead, a more hard-line approach is offered: confiscate drones. In principle such a discussion is useful to have. It illustrates the significant rates of non-compliance with fines and the subsequent resources expended on defaulters. Lord Campbell-Savours implies that similar rates would accompany drone fines. Confiscation may be one approach to enforcement, and one which Lord Campbell-Savours seems to favour if it 'concentrates the mind' and introduces a degree of rational choice weighing up the risks and rewards for an offender faced with the prospect of losing their costly drone. Confiscation was implied also in the above discussion with the pilot regarding the drone flying over the football stadium. However, the officer has articulated a hypothetical scenario which is plausible on their experience of dealing with suspects. Hiding the drone, denying involvement, feigning ignorance are relatively easy strategies to evade enforcement. It also points to a rationality inherent to drone crime, specifically, which is ostensibly separate from the type of misuse which Lord Campbell-Savours is discussing: confiscation may promote a deterrent effect for hobbyists or commercial users who could be economically affected by confiscation

but this does not relate to other criminals who may see the drone as a 'single use' delivery device for crime commission. The economic loss of a drone (confiscation by the prison or police services) would be offset by the profits to be made from distributing drugs inside prisons. Current and future policing of drone misuse will have to contend with such evasion tactics and rationalities, which certainly highlights the limits to implementing policy into practice and illustrates the power absence of effective and practical solutions has for enabling drone crime.

Colonising and permeating

The colonising and permeating potentials of drone policing point to its capabilities in intervening in, and controlling, social life within particular spatial-temporal contexts ('technogeographies' (Shaw 2016)). The discussion of this in Chapter 2 related colonisation and permeation to spatial geographies of control; the technologies of so-called 'high policing' (Brodeur 1996, 2007) subsume space and those who move within it into the instruments of state power. Discussion in the literature on the spatial-temporal dimensions of techno control offer a series of deterministic theoretical concepts: 'enclosure' and 'atmosphere' (Shaw 2016); 'dronosphere' (Andrejevic 2016); a 'cosmic view of air mastery through technological speed, verticality, and vision' (Wall and Monahan, 2011: 241; see also Neocleous 2013); and 'techno-biopolitical assemblage' (Schwarz 2016) to name a select few. Such concepts provide deterministic accounts on the types of regimes which drone technology engenders, regulates, and sustains. These can all be summarised as regimes of drone power which percolate within forms of life, occupying the 'liminal spaces' (Wall and Monahan 2011) and gaps of modern life. Such depictions are perhaps more relevant to drone technology's military applications: the Cavallaro et al.'s (2012) *Living Under Drones* project was conducted in Pakistan, interviewing some 130 victims of so-called 'surgical' strikes which have caused mass civilian casualties (see Bureau of Investigative Journalism 2017). At this time, the zenith of the clandestine US drone wars in the global borderlands, the visceral, totalising regime of the drone wars was brought into stark relief. Subsequent research has argued that military and civil drones exist on a continuum (Neocleous 2013) and that civil drones are liable to induce similar disruptions to domestic spheres in the west as the regimes installed in the borderlands 'boomerang' back (Jensen 2016), however.

This section seeks to offer an empirical critique to such determinations that drone policing is capable of achieving such colonising and permeating potentials: a domestic police drone regime. In principle, such concepts are important for providing a vocabulary with which to articulate the problems drone technology raise and the regimes of power which accompany them. Yet it is a crude over determination, an empirically baseless error, which severely over-estimates the reality of this regime which is instead a negotiated one. A course, admittedly simplistic critique of Shaw's (2016) drone enclosures (allegedly an impending global phenomenon) might propose that such a project of global enclosure is dependent upon an enormous number of flying drones colonising the skies. The case study drone programme operated four devices covering a total force area of approximately 1,500 km^2 containing a population of over half a million inhabitants. This is hardly compelling evidence of a local enclosure within the force boundaries, let alone a budding global one. Even the forecasted rapid growth of drone industries in the UK (accompanied by an estimated 76,000 drones in UK skies by 2030 (PwC 2018)) does not account for the actual limits which will be placed on these in terms of where drones will legally be permitted to fly. Nor does it consider how the aerospace landscape will continue to change (and reduce) over time; the Government response to the 2018 Gatwick Airport disruptions was to impose greater restrictions on flights around airports the following month (Department for Transport 2019). As the above discussion on criminal drone extensions highlights, along with the precautionary tendencies of UK state narratives, the inevitability of future drone crimes will doubtless have an impact on legislation and the regulation of drone flying spaces.

It is prescient to therefore approach drone policing as a negotiated regime; one which is negotiated between the object of the drone, its police users, and the regulations concerning legal/permitted flying spaces. How these elements interact with one another demonstrate the actual power to perform drone policing and how it is conditioned in particular empirical contexts. Thus conceived, the empirical reality of drone policing can be demonstrated, and nuance can be added to the preceding determinations of drone regimes.

Negotiated space

Operational support policing takes place in two very different worlds. The first world reflects the station or the vehicle (so-called 'police-controlled spaces' (Holdaway

1983)) and this is where the downtime between jobs is usually spent. The quiet of the station or the vehicle is almost amniotic, compared against the high-octane nature of kinetic Unit activities (see Chapter 7), and is equal parts productive and dull. During this time officers can catch up on paperwork, prepare statements and suspect interview schedules, eat and take tea and coffee breaks, and generally engage in the sort of banter and storytelling which cops are known for (Shearing and Ericson 1991). Officers can seek to remain in the first world by selecting which calls they attend – a careful assessment of the ongoing jobs available through the force IT tasking system can determine whether a Unit response is required, or if local neighbourhood policing teams can handle them. *"Man with stick in [nearby city]? No."*, one officer uttered to themselves when seeing whether any jobs were available which the drone could be used for. (Fieldnotes)[55] This ranking of the job in question reflects Bowling's (1999) hierarchy of police relevance: the 'man with stick' was an example of 'rubbish' crime and not worth venturing outside the station for.

Holdaway (1983) offers a cogent exploration of the police use of space in his classic covert ethnography of the 'Hilton' police subdivision. In it, Holdaway likens police-controlled spaces to Goffman's 'backstage'; it is a private world which is separate from the world 'out there' and officers exercise considerable degrees of autonomy and discretion to expand and maintain their control within it. Intrusions into the backstage by, for example, duty solicitors, doctors, or senior chiefs, were managed through careful 'staging' behaviours to hide indiscretions and present a 'front': 'The temporary impression is one of tidy efficiency and managerial control' (Holdaway 1983: 25). It is important to also reflect upon my own 'intrusion' into the private spaces of Unit policing because, unlike Holdaway's, my presence was overt, and officers were more likely than not to know my reasons for being there. This sometimes led to officers correcting their language around me:

> An officer storms into the station after unsuccessfully executing an arrest warrant and starts complaining about the "scrote" in question. They see me (knowing I was a researcher) and quickly correct themselves – "I mean, 'end service user'".
>
> [Fieldnotes]

[55] Unit drone intervention had not been expressly requested for this incident. If it had, the outcome may have been different.

But then a spontaneous call comes in over the radio or an officer must attend a pre-planned job and the officer is brought out of this quiet world and thrust into the second – the world 'out there'. The world out there is, simply, filled with *"scrotes"*, an interesting and uniquely police-centric membership categorisation device which effectively defines the public as suspect, as criminals-in-waiting, as people *to be policed*. Unlike the officer above who corrected their use of *"scrotes"* in my presence, most other officers were less likely to correct themselves. During a drive I am shown the dashboard-mounted automatic number plate recognition (ANPR) device which assesses vehicles against databases such as the Driving and Vehicle Licensing Agency and the Police National Computer. The screen provides a photograph of each license plate captured by the camera and any relevant information about the police interest in the vehicle – most commonly no tax or registered keepers.

> The officer is pointing at cars and guessing what the ANPR might show. "Doubt they've taxed it". "Pulled that one over not long ago". "That's a piece of shit".
>
> [Fieldnotes]

This is broadly similar to Waddington's (1999) 'us versus them' sentiment explained in the classic 'canteen culture' discussed in Chapter 2 as a means for police to delineate themselves from the public by 'othering' the latter. That the officer was making these statements within the vehicle – a microcosm of the private police world – shows the symbolic strategies used by police to replicate the sanctity of the inner world within the public one; private spaces are continuously produced and re-formed wherever an officer may go.

These two worlds co-exist in some degree of harmony; without one the other would not exist, nor would it need to. The private world is a reaction to the other world out there – a 'home territory' (Holdaway 1983) which grants privacy, safety, quiet. The public world is volatile, unpredictable, and Unit intervention within it is usually temporary and for kinetic operational purposes. How drone policing seeks to maximise police control over public spaces became a central orienting concept following the aforementioned interactions with officers in their territory. However, this was conditioned by the observations of the strategies of police spatial control which highlighted its negotiated nature; a distinction made between the symbolism associated with control and the instrumental nature of actually controlling space. This

modifies Holdaway's (1983: 91) argument to the effect that symbolism and instrumentalism cannot be separated in the police world: 'any separation of symbolism from instrumentalism is tenuous and analytical'. Instead, the symbolism of police presence within space and the possibility for instrumental action were entirely separated. One understanding of this is Chamayou's (2015) discussion on safe versus hostile spaces. However, Chamayou was writing in the context of the drone wars, whereby these spaces exist oftentimes many thousands of miles apart – the divide is physical as much as it is symbolic. Drone policing takes place in very different contexts whereby the safe/hostile divide is more symbolic than actual, and captures the continuous re-forming of police-controlled spaces. In turn, the instrumentalism of drone policing is separated, not tenuously but substantively, by the strategies of enforcing the safe/hostile divide and the production of symbolism therein.

The following two fieldnote extracts present data on observations which were not directly related to drone policing; however, they add some additional contextual information to how police presence within space is conditioned by the reactions (or lack) of members of the public.

> We come to a complete standstill in the traffic congesting the A road. From the elevated position in the panel van, myself (seated in the back) and the two officers in the front can see down into the cars around us. A driver next to us is looking at their phone and has clearly not seen the police van beside them. The officer driving becomes infuriated, shouting through the window "Get off your phone!" When the offending driver fails to notice, the officer leans on the horn and flashes the blue lights: "How can you not see me?!" "It just shows how distracted they are on their phone". Eventually the offending driver notices the officer hanging out of the window and shouting at them and drops the phone into their lap, offering a meek apologetic wave. The driver goes on to say that if they were not stuck in traffic they would have 'written the driver up' and they were annoyed with themselves that they had not managed to see the offender's license plate.
>
> [Fieldnotes]

The projecting power of police vehicles was illustrated in a different way immediately after the above episode.

> A call comes in over the radio from the control room requesting assistance. The officers quickly look at one another and with a nod accept the call and turn on the blue lights and siren. The traffic quickly parts as best it can in the

> congestion and the van is able to pick its way through, slowly at first but quickly gaining speed.
>
> The control room soon after calls again and instructs the officers to 'stand down' – I could not hear the reason given over the sound of the sirens. The officers note the call back but look at each other – they were pleased with the progress they had made through the traffic and make comments to the effect that they had not heard the instruction. We carry on at speed through the traffic with the sirens and lights blaring. Only once we have made it past the main congestion were these turned off and we returned to driving normally to head back to the station for tea.
>
> [Fieldnotes]

These two contiguous episodes demonstrate the duality of presence. In the first, the officer is seeking to extend control over the car beside us, using the vehicle in an attempt to enforce driving rules concerning phone use over an unaware driver. We see how control is extended beyond the vehicle itself as the officer attempts to draw the offending driver within their sphere of control (Holdaway 1983: 91). In the second, the vehicle performs a similar but distinct extending function. The same blue lights flash, the same siren blares, but the power to alter the congested traffic is realised more effectively to achieve the end of getting through it to respond to the call. The vehicle colonises space in both instances, but its capacity to do is conditioned by others surrounding it.

Drone policing therefore colonises and permeates spaces which are liable to enable it; it is not total but conditioned by the realities of restricted airspaces, the internalisation/appropriation of external regulations, as well as the need to exceed regulations from within through voluntary mechanisms. Claims to the 'saturation' of modern life with the technologies of control (Marx 2007) ultimately fail to appreciate the more mundane, banal limits which are imposed upon these technologies.

Data collection

Drone technology, capable of conducting multi-spectrum surveillance over relatively vast tracts of space, raises concerns surrounding privacy. In transforming target areas into data-rich sites, the *colonising and permeating* potentials of drone technology (as it intervenes into spaces beyond the reach of ground- and foot-based officers) become realised. This abstract dimension of drones feeds into the third defining dimension relating to their deployment in a *data gathering* capacity, which necessarily intersects

issues of surveillance practices. Much of the literature on drones evokes concern with 'surveillance' and the 'panopticon' (see Chapter 2; Wall and Monahan 2011; Neocleous 2013; Shaw 2016; Wall 2016). The below fieldnote extract demonstrates the potential for the technology to gather a range of visual data types (albeit during a training flight) which may support claims to a panoptic effect. In another instance, during a demonstration of the drone to force members a pilot switched to thermal optics and discovered a suspected cannabis factory in the roof of a nearby house. This intelligence was used to obtain a warrant and a successful property search was carried out.

> Above an empty field the drone flies to the maximum altitude and distance permitted and the pilot turns the drone to face us and the car park behind. On the viewscreen on the controller we appear in thermal optics as white figures against the grey and black field. Behind us the tyres of a parked car glow white – the residual heat from driving. The pilot mentions that this would be ideal in a search for a vehicle which may have come to a stop or the suspect had 'de-camped' – if it had recently stopped then the thermal would show the residual heat. Switching to the optical zoom function the pilot then focusses the camera on the car's number plate. At this distance the image is shaky as the drone drifts in the wind, but the plate can just about be made out. Although not a perfect image, the pilot suggests that we can at least make out the car make and model at this distance, which would be of some use in a search.
>
> [Fieldnotes]

There is a clear relationship presented in the above extract between the drone as data gatherer *for a purpose*. This is a critical moment for reflection on the enterprise of police surveillance for the key reason that it challenges conventional views that police surveillance is conducted indiscriminately, and that purpose is found (or surveillant activities justified) after the fact. In Gary Marx's (2007) article discussing the 'engineering of social control' through police surveillance technologies, for instance, the concept of 'soft' social control is articulated: 'Soft control includes low visibility or invisible techniques and is often built into the environment, not being perceived as a form of control' (Marx 2007: 47). From these low visibility techniques flow the influence of control agents, projecting in this case surveillant power to regulate social life in a way which is ever-present; a surveillant spectre which looms in the background of quotidian life (see also Andrejevic 2016). The above fieldnote extract subverts this view by instead illustrating the active particulars of this drone deployment. It was not a form of surveillance conducted passively and

indiscriminately due to its embedding into the environment. It was directed, purposeful, and had clear operational outcomes.

This thesis challenges the conceptualisation of drones as a panoptic and low visibility, pervasive tool which is embedded into its environments, however. The term 'panoptic' – i.e. the one watching the many – implies a totality of visual control flowing from the drone in the direction of subject populations. This is an illustration of *in potentia* power (Latour 1984); something which is theoretically held. Foucault's conceptualisation of biopolitics/biopower might fruitfully explain this totalising effect of state surveillance acting within the quotidian fabric of social life. Developing this point further, Shaw (2016: 108) argues for a notion of drone 'enclosures'; an 'atmospheric' power which captures life within the apparatus of drone technology and, as a biopolitical project, 'regulates […] the spaces of life'. However, the Latourian paradoxical nature of power instead shifts focus toward the limits to panoptic power *in potentia* and the realities of panoptic power *in actu* which is conditioned by, in this case, the regulatory frameworks which surround police surveillance technologies.

The regulation of drone technology by police falls under established frameworks concerning police surveillance camera systems more generally. Police surveillance technologies are regulated by the Surveillance Camera Commissioner, a role appointed by the Home Secretary and established under the Protection of Freedoms Act 2012.[56] 'Surveillance camera systems' are defined by Section 29(6) of the Protection of Freedoms Act as:

> (a) closed circuit television or automatic number plate recognition systems,
> (b) any other systems for recording or viewing visual images for surveillance purposes,
> (c) any systems for storing, receiving, transmitting, processing or checking images or information obtained by systems falling within paragraph (a) or (b), or
> (d) any other systems associated with, or otherwise connected with, systems falling within paragraph (a), (b) or (c).

Given the thesis' claims to a specific ontology of drones, as separated out from other technologies of surveillance such as CCTV, the Protection of Freedoms Act presents a rather broad definition designed, ostensibly, to capture the myriad types of

[56] Official text of the Act available online at: http://www.legislation.gov.uk/ukpga/2012/9/contents/enacted [Accessed 5 November 2019].

technologies police currently use or may come to use in future. 'Future-proofing' regulation in this manner, however, does not resolve the ontological foundation of the thesis: that drones represent something entirely unique in their composition, capabilities, and uses.

The Surveillance Camera Commissioner's statutory responsibility is to encourage compliance by Relevant Authorities with the Surveillance Camera Code of Practice (SC Code). The twelve principles of the SC Code (Home Office 2013: 10-11) are summarised as follows:[57]

1. Use must be for a specified purpose, have a legitimate aim, and a pressing need.
2. Account for individual's privacy and conduct regular reviews to ensure use remains justified.
3. Transparency in use, published contact point for access to information and complaints
4. Responsibility and accountability for all surveillance system activities, including information collection, storage, and usage.
5. Rules, policies, and procedures must be in place and communicated to users.
6. No more information should be stored than necessary, and information should be deleted once purposes have been met.
7. Access to information should be restricted, clearly defined rules must be in place for who can access information and for what purposes, and disclosure should only occur when necessary or for law enforcement purposes.
8. System operators should consider approved standards relevant to the system (such as operational and technical) and maintain those standards.
9. Information should be appropriately secured and safeguarded against unauthorised access and use.
10. Effective review and audit mechanisms should be in place, ensuring practical compliance with legal requirements, standards, and policies, and publication of regular reporting.
11. When use meets Principle 1, the system should be used to support public safety and law enforcement and process information of evidential value.
12. Any information compared against a reference database should be accurate and up to date.

The police are specified as a Relevant Authority under Section 33(5) of the Protection of Freedoms Act. Following the SC Code, the *National Surveillance Camera Strategy*

[57] See also Surveillance Camera Commissioner 'Steps to complying with the 12 principles'. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/409290/12_principles_diagram_v3.pdf [Accessed 4 November 2019].

for England and Wales[58] (the Strategy) was published in 2017 which sets out the responsibilities of Relevant Authorities in relation to the SC Code and related legislation[59] concerning surveillance. Figure 3 below illustrates the governance structure of the National Surveillance Camera Strategy relevant to the 'Police' strand.

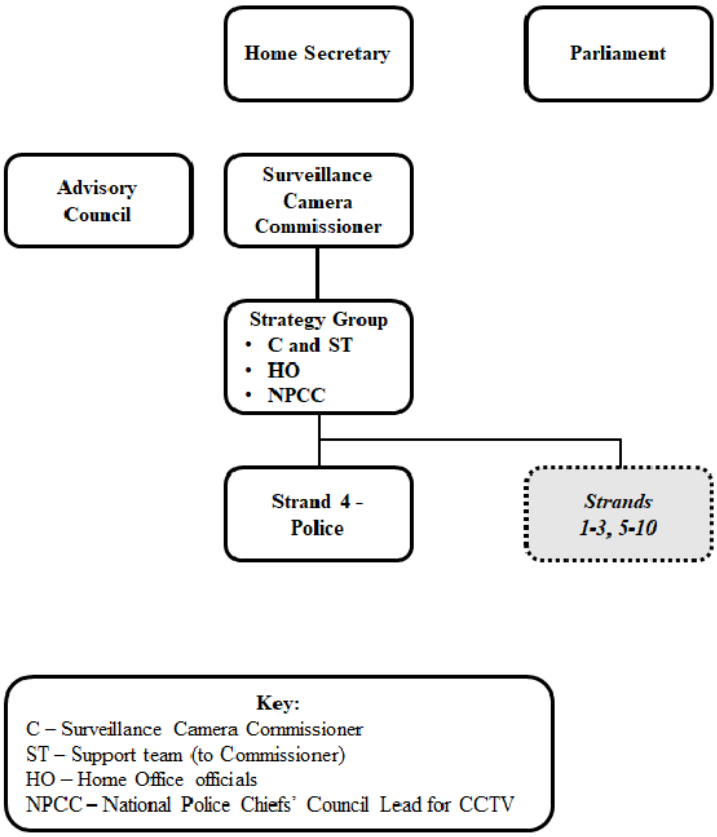

Figure 3. *The National Surveillance Camera Strategy governance structure (adapted from National Surveillance Camera Strategy for England and Wales 2017: 23)*

Regarding the police, the Strategy is recognised by the National Police Chief's Council (NPCC) Lead for CCTV who works closely with the Commissioner to ensure ethical, legal use of surveillance technologies. In a 2017 blogpost, the then Lead for CCTV Tim Jacques (Assistant Chief Constable, Lancashire Constabulary) states that he 'represent[s] the interests of all the NPCC leads for surveillance cameras namely –

[58] Strategy available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/608818/NSCS_Strategy_post_consultation.pdf [Accessed 5 November 2019].
[59] Human Rights Act 1998, Data Protection Act 1998, Crime and Disorder Act 1998, Freedom of Information Act 2000, Regulation of Investigatory Powers Act 2000, Private Security Act 2001, Investigatory Powers Act 2016, General Data Protection Regulation 2016.

automatic number plate recognition (ANPR), body worn video (BWV) and unmanned aerial vehicles (drones)'.[60] Notwithstanding the fact that each of these technologies are represented by respective NPCC leads, the subsuming of *multiple* surveillance technologies under the umbrella of CCTV risks flattening out the substantive differences between these technologies or, more importantly, altogether overlooking them. A 2019 blogpost by the new NPCC Lead for CCTV, Jenny Gilmer (Assistant Chief Constable, South Wales Police) focusses explicitly on CCTV.[61]

The former NPCC Lead for drones Steve Barry established during his tenure as Lead that drones are an operational matter for individual chief constables: 'Deploying drones is a decision for individual chief constables who ensure that they are used appropriately in the interest of public safety and efficient allocation of police resources' (NPCC website, 2017). As Chapter 5 demonstrated, this has led to significant processes such as the uneven distribution of drone technology across England and Wales and established the thesis' claim to a particular localism to drone policing. With regards to the centralised regulation of surveillance technologies, this premise also extends into the internal, local practices of ensuring (and exceeding) compliance with this landscape. The discussion now turns to the empirical data gathered during the fieldwork period which brings the self-regulation of drone surveillance into focus. Moreover, an important finding related to the challenges of surveillance as defined by police is presented, indicating a tension within informants' perspectives on what constitutes surveillance risk and the institution of best practices.

Internal recognition of surveillance risk and opportunity

External regulations, such as the SC Code and data protection, influenced the development of the case study drone programme in numerous ways. Compliance with the SC Code was a focal point for programme managers especially during the transitionary period between the 'proof of concept' and 'going live' phases (see Chapter 6). In an informal interview with a programme manager conducted at the start of the fieldwork period (and before the drone 'going live' phase), the SC Code principles were alluded to:

[60] Blog available online at: https://videosurveillance.blog.gov.uk/2017/09/28/the-national-surveillance-camera-strategy-and-policing/ [Accessed 7 November 2019].
[61] Blogpost available online at: https://videosurveillance.blog.gov.uk/2019/10/09/leading-the-policing-strand-of-the-national-surveillance-camera-strategy/ [Accessed 7 November 2019].

> A central ethos of the drone programme, in their view, is ensuring that drone flights are transparent. Pilots are instructed to record the entirety of the flight – from take-off to landing. This appears to have two benefits. The first is that the actions of the pilot can be recorded and reviewed post-flight. In the event of a crash this would be useful data to examine what went wrong. Any criticism levelled at the pilot can also be scrutinised – was the flight carried out safely? The second is that the evidential value of recorded information can be ensured. Instituting this 'best practice' (constant recording) limits the risk of pilots failing to begin the recording once they have arrived on the scene.
>
> [Fieldnotes]

This extract presents the (voluntary) ethos of the drone programme's approach to data collection. It also highlights the ways in which the SC Code principles (see above) were recognised and compliance was internally adopted and, from the programme's perspective, voluntarily exceeded. In some regards, the ethos exceeds the principles yet in other regards it shows how these same principles can be appropriated and re-defined in the context of drone policing from the practitioner perspective:

- Drone data collection activities are accountable (principle 4) to internal review processes within the drone programme, enabling scrutiny of pilot activities and to ensure that legal standards and drone policies are maintained (principle 10).
- It is deemed necessary to collect and store (for a clearly defined period) the entirety of drone deployment data for the purposes of review and scrutiny (principle 6). It being an automatic design feature of the drone effectively 'proofs' the drone against the mundane liabilities of drone pilots to forget to record. Also, and perhaps more conspiratorially as no indication was given during the fieldwork period of this occurring, this may also negate the possibility of pilots consciously choosing not to record flights or to select portions of the flight which they want recorded. The possibility of deviant behaviour, bolstered by the wide discretionary powers afforded by pilots who oftentimes operate beyond the purview of programme managers and others who may hold them to account, is delimited in this regard.
- Access to drone data is restricted (principle 7) to those within the force who may require access to it for purposes of review.
- Drone data are stored on the widely used force data management system, ensuring compliance with common data handling processes (principle 9).

Constant recording therefore also extends surveillance potential 'backwards', with the pilots themselves becoming surveilled subjects. The intended purpose of this was to enable quality assurance, review failures, and to provide evidence in the event a pilot is challenged on the legitimacy of their flight by others within the drone programme or the force. Importantly, data were not necessarily available to members of the public through, for example, Freedom of Information Act 2000 requests; it was primarily for internal use or to assist in criminal evidence/court proceedings. The surveillance of police technology users is not a drone-specific phenomenon – a small amount of evaluation evidence relating to body-worn cameras, for instance, highlights a similar theme (see Lum et al. 2020 for a review) – which indicates a growing emphasis amongst criminal justice practitioners of the utility of recording their own. This suggests a multi-functional dimension of surveillance and provides an empirical corrective to more one-sided claims regarding the totalising panoptic effects of police surveillance (see *inter alia* Wall and Monahan 2011; Neocleous 2013; Shaw 2016; Wall 2016). It demonstrates limits to the conventional demarcations between state (the surveiller) and state subjects (the surveilled) in state-centric analyses of surveillance power; it is decentralised and diffused amongst a variety of actors and what is 're-centred' is the causal potential of the drone itself as a surveillance tool which acts indiscriminately.

Approximately twelve months later another programme manager discussed the following:

> [Programme manager] has been in contact with the force IT staff because too much data are being generated by the constant recording of drone footage. The force data infrastructure cannot handle the data being produced and stored. They do not see this as a reversal to the ethos of 'constant recording' as this is just a matter of practicality and the limits of the force data infrastructure systems.
>
> [Fieldnotes]

The second extract indicates that the decision to stop constant recording was more a matter of practicality and therefore did not constitute a 'reversal' of the initial ethos, at least on the view of the other programme manager. This is a significant finding, and one which is not so straightforwardly analysed through the theoretical lens of policing and surveillance. As previously criticised, the overwhelming preponderance toward surveillance theories of drone policing in the literature fails to account for the limits

to surveillance power which is imposed externally via regulatory frameworks and internally via voluntary mechanisms as well as the actual technical limitations of drones to be 'always on'. The ethos of constant recording might be criticised as a means for drone policing to capture data indiscriminately under the guise of 'review' procedures which are transparent only to those relevant occupational members (those under the 'sacred canopy', to re-use a phrase (Manning 1997)). The inability of the public to engage in and negotiate what constitutes fair or just or transparent surveillance as it happens in the workaday routines of drone policing is a significant point of contention. The eventual rolling back of constant recording might therefore arguably be a boon for critics; indiscriminate data collection has come to an end and surveillance power is curtailed. But no negotiation of power has taken place. The public have no input into this decision and it was not made to pacify criticism. It was simply a matter of resource limits and the need to be more parsimonious with the force data infrastructure capabilities.

8.5 Discussion

This final data chapter has examined the regulatory dimensions of drone policing. The analysis commenced with an appreciation of McGuire's (2012) technomia concept as a means to understand how drone policing acts in a regulatory capacity as well as a phenomenon which is regulated. By exploring the narratives surrounding drone technology and its potentials within contemporary UK society, the case was firstly made that drone policing represents just one partial element to the wider process of drone enablement now and in the future. Presenting and critically analysing the recent policy discourses surrounding drone diffusion provided vital empirical and conceptual context to explain the emergence of drone policing. Discussing this retroductively (Danermark et al. 2002), it is possible to conclude that drone adoption amongst police forces has been made possible due to the wider acceptance drone technology has garnered and widespread recognition of its benefits. The analysis then turned to the abstract dimensions of drone policing proposed in Chapter 2 which separate drone technology out from other, similar, technologies of crime control and surveillance.

The first dimension, extension, was adapted in the light of recent signal events concerning drone-enabled crime. This is an adaptation to the initial proposition (P_4) because it encompasses the ways in which drone crime extends *what is to be policed*.

The data on drone crime are admittedly sporadic and exceeded the confines of the single case study methodology adopted throughout the thesis. Analysis beyond these confines intended to demonstrate the emergence of such a dynamic phenomenon, locating policing within a shifting environment of crime control. However, caution is needed not to overstate or oversimplify the potentials of drone crime. No evidence or argument was presented to the effect that drones represent a 'master shift' (Cohen 1985) in the nature of crime which is performed using new drone means. The evidence of drone-related calls reported by the force (Table 3) does not demonstrate any significant patterns, nor a specific protocol for dealing with such reports. Rather, the analysis intended to demonstrate that drone crime *is happening* and, as such, important questions were raised concerning the role of police in managing such events.

The second dimension, colonisation and permeation, was considered in the light of the temporal-spatial control strategies employed by police. The empirical evidence highlighted that theoretical determinations that new, totalising regimes accompany drone policing fundamentally overstate the realities of policing. Instead, the idea of 'negotiated space' was introduced as a significant finding, supported by empirical data which show how police presence is not automatically invested in authority or power. What is more likely, given the above discussion, is that drone policing is liable to control spaces which are eligible to be controlled. How officers seek to maximise their control, in terms of re-producing and hardening the distinctions between private and public worlds was a central theme. This makes a significant contribution to understandings of the role of drones in controlling space and their impacts upon so-called 'technogeographies' (Shaw 2016), refuting scholarly claims that drone policing must be recognised as some totalising, 'enclosing' regime.

Finally, the discussion on drone data collection as a regulatory practice was explored. Arguably, drone surveillance is the most controversial dimension, embedded as it is in the surveillance concepts led by Foucault and contemporary descendants.

The initial proposition stated that drone policing would enable the regulation of certain aspects of the social world, tied as it was to the extending, colonising, and data collecting aspects of drones. However, as the findings have demonstrated, it was not anticipated that regulatory activities would focus 'inwardly' upon the programme itself. This is not to diminish the threat landscape of a drone-enabled society; the preceding discussion on signal events and the regulatory work which surrounded these as a consequence highlight prominent, and concerning, vulnerabilities. Framed as a

context-mechanism interaction, the findings indicate that the internal and voluntary regulatory context of drone policing bears upon the mechanisms which are liable to shape the use of drones by police. The mechanism of extension was projected toward the emergence of drone-related offending, demonstrating how as new user groups also have their capabilities extended, police must contend with a dynamic risk environment. This unanticipated development demonstrated how drones are extending *what is to be policed* and the challenges associated with applying regulatory and enforcement controls. The colonising and permeating mechanism illustrated the types of spaces which drones are more realistically capable of intervening in. Within the context of internal regulation, this finding indicates that the symbolic and instrumental aspects of drone policing co-exist in a constant state of negotiation. The third mechanism, data collection, provided an empirical critique to the presumed omnipotence of surveillance drones. Voluntary regulation such as 'always-on' recording was designed to monitor the activities of police users themselves, demonstrating how the programme sought to exceed national surveillance principles in its own manner. The case is made therefore that explaining how drone policing was firstly regulated from within, legitimated by its own users, and the regulatory controls which programme members were (voluntarily) subjected to supersedes any exploration of how drone policing is liable to perform external regulatory functions (in the social world). To understand the internal permits subsequent study of how these mechanisms are enabled and constrained. The initial proposition is refined and quite significantly modified in the light of the findings from documentary and fieldwork analyses: *Drones enable considerable augmentations to police practices. Internal and voluntary regulatory practices are the first stage in understanding the 'nomos' surrounding drone policing. From these internal regulatory practices flow the subsequent potential for drone policing to regulate other aspects of the social world.*

Chapter 9: Conclusions

9.1 Introduction

This has been a study of drone policing. The combination of observational, interview, and documentary data techniques provided a methodological platform from which to explore a burgeoning drone programme in close detail whilst also enabling considerations of its broader national and historical dimensions. The study grew out of frustrations with extant theoretical literature which displayed a preoccupation with teleological narratives about drone technology; its capabilities were overstated and the contexts which condition and shape its use oversimplified (or ignored). Drone policing has also been an under-evaluated phenomenon which pointed up the need to fill this evaluation gap (in order to promote the wider relevance of this study to practitioners) and to reveal the deeper consequences of technologisation for policing. This study therefore represents a combined 'evaluation research' piece existing at the forefront of one of the most dynamic technological changes to affect policing in England and Wales in recent years. The 'emergent-ness' of the problem was an intractable part of this study, raising challenges in terms of the study's generalisability as well as how timely findings were. Technological change marches on inexorably and data unfortunately suffer from a relatively short half-life. Layder's (1998) adaptive theory approach was deemed an appropriate way to recognise and mitigate these challenges by encouraging a constant dialogue between data and extant theory. Theory served as a touchstone for navigating the complex, sometimes chaotic empirical findings.

The study sought to address a critical realist question: *how and why has drone policing been made possible?* Drone policing is a regular occurrence across England and Wales, as well as internationally. The technology is attaching itself to many routine aspects of police business, opening up novel opportunities for police to perform its role. From the outset of this thesis, the case has been made against teleological accounts of drone technology and the technologies of crime control more generally. The panoptic effects of 'always-on', sensory 'dronospheres' portray creative (dystopian) visions of life under drones in domestic spaces (Andrejevic 2016; see also Wall and Monahan 2011; Neocleous 2013; Shaw 2016; Wall 2016). Expressions of power become increasingly embedded within political accounts of control and regulation. Yet this study has problematised this by switching the focus

away from purely theoretical claims which are derived *in thought* toward empirical analysis of drone policing *in action*. The task was not, as Winner (1986: 10) puts it, to 'measure the treadmarks' after the behemoth of change has bulldozed over us. Such an endeavour would have left little space for discussion beyond drones as inert causal agents (and nothing more), how technological change was actually endured, promoted, and negotiated, nor the social conditions which have made this change possible in the first place. This thesis has advanced an alternative critical philosophy of drone policing, tempered by the real and substantive differences between the social and the technical. Social relations to drones have been shown to be mediated by processes of evangelism and resistance, to form emergent enclaves of community and value systems, and to evolve as a response to broader national and local operational needs. Technical relations to policing have been shown to be marred by malfunction and altered by obstacles of the natural world, all whilst occurring in the midst of drone proliferation in UK society. Together, it is possible to assert that both the social and the technical have exerted shaping influences upon one another.

9.2 Re-cap of main findings

The initial propositions which emerged from the literature review (Chapter 2) structured the subsequent data analysis chapters (Chapters 5-8). These each isolated specific dimensions of drone policing and each proposed a particular explanation as to *how and why drone policing has been made possible*. The initial propositions were subsequently developed in the light of prior theory, empirical findings from fieldwork observations and interviews, as well as documentary analysis and ongoing scanning of the theoretical literature (see especially Chapter 7). Based on critical discussion throughout this thesis, it was therefore possible to reformulate the initial propositions into more specific, empirically-informed concluding statements addressing the research question. The following is a re-cap of the main findings to emerge from this study.

Chapter 5 explored the localised governing arrangements of drone policing, revealing that the current state of drone policing programmes across England and Wales is fragmented with high degrees of local variation. Because of the single case study restrictions of this study, claims to the significance of 'the local' as an explanatory mechanism are necessarily limited to just this empirical setting. However,

by reviewing relevant documentary sources on reform proposals and the emergence of specialist capabilities onto the policing agenda, it is possible to explain the local nature of drone policing with a degree of wider relevance. In particular, this chapter revealed many of the challenges which are confronting the comparable air support delivery model – the National Police Air Service. Based on judgements made by HM Inspectorate of Constabulary and Fire & Rescue Services (2017) the case was made that partnership delivery of air support revealed a series of tensions. These tensions included perceived lack of value for money, actual funding inequalities in comparison to services received, and unequal service quality and response times experienced by the partnered police forces. These partnership tensions were further contextualised in terms of deeper historical reform proposals which were intended to bolster shortcomings in service delivery at the supra-local levels, as well as more recent developments of police specialist capabilities. Many of the reasons given for 'networking' police responses – including cost savings, resource-sharing, and so on – were deemed relevant to drone policing. However, based on empirical findings, the argument was made that current localised arrangements were most suitable for the delivery of drone policing, given the aforementioned challenges. Drone policing has therefore been made possible because of the current localised arrangement. It emerged out of a national context which was fragmented, with forces receiving unfavourable and disagreeable terms from pre-existing national, centralised air support. Drones present an opportunity for forces to make up for shortfalls by providing a specialist aerial capability which is relatively cost effective, can respond and be tasked quickly, and can perform many of the same functions as a helicopter. This is the most effective and efficient means to deliver specialised air support because local drone programmes subvert many of the evidenced challenges associated with other, comparable partnership approaches to delivering specialist capabilities.

Chapter 6 considered the enrolment of drone technology within the organisational structure of Unit policing. More specifically, it charted the progress of the drone programme as it manoeuvred from a 'proof of concept' toward an eventual objective as a 'live' force-wide asset. This objective was not achieved during the fieldwork period; technical setbacks undermined progress. The initial proposition was admittedly overly socially deterministic because it anticipated that organisational structure alone would be a necessary condition for the perceived success of the programme. Findings instead demonstrated that whilst organisational structures were

necessary, particularly those revolving around evangelists, the unanticipated technical problems which afflicted the programme were similarly critical for explaining how the programme was managed and made possible. The initial proposition was therefore adapted in order to reflect also the significance of technical liabilities. In this way, the social and the technical relations of drone policing were taken separately but relatedly as mutually shaping causal factors.

Chapter 7 considered the influences of occupational culture upon the drone programme. The occupational culture is a rich source of empirical data for police sociologists; there is an ethnographic tradition in the field and as such a series of robust 'core' cultural characteristics have taken root. For the purposes of this chapter, the core characteristics of the sense of mission and orientation toward action were adopted as the main conceptual framework for understanding operational support policing (Reiner 2010). These were best suited to understanding the Unit's unofficial motto: *"driving fast cars and kicking down doors"*. This was a particularly singular view of Unit policing and tied to a (somewhat nebulous) notion of 'real' policing. The implication was that drones did not count as 'real' policing, based on criticisms levelled at the programme and its members. The initial proposition was that, due to the overwhelming significance of occupational-culture in studies of policing, drone policing would likely be explainable in occupational-cultural terms. There would be an interaction between cultural norms and values and the emergence of this innovative piece of equipment. What was unexpected, however, was that the interaction would spawn a nascent cultural turn toward learning and safety. Whilst Unit members and programme critics were not luddites being involuntarily dragged into the technological era, the drone did attract a considerable amount of negative criticism. (This was phrased as 'jealousy' by programme members, but I would suggest it went much deeper to pose an existential threat to 'real' policing and identities which were bound up in this.) In line with the adaptive theory approach (Layder 1998), additional scanning of the technology studies literature was required in order to make sense of this turn, and Star's (1989; Star and Griesemer 1989) conceptualisation of 'boundary objects' was adapted in the light of this finding. The novel concept of cultural enclaves was therefore offered as a means to understand how divisions *within* a community of practice occur due to a new technical device and associated technical activity. Drone policing is therefore made possible, in this case, by a re-presentation of what constitutes 'real' policing and the associated cultural meanings bound up in this.

Drones are liable to disrupt and threaten some representations of this ideal. Therefore, drone policing is made possible by programme members whose cultural values and norms are capable of being shaped to recognise drones as an identity-affirming object. This is efficacious given that the drone programme suffered considerable setbacks and failures. To have cultural norms and values shaped meant that these setbacks were learned from and the programme's continued existence was secured.

Chapter 8 examined the regulatory dimensions of drone policing. It began with McGuire's (2012) conceptualisation of technological 'nomos' – that technology regulates and is regulated. This was initially intended as a means to understand how drone policing intervenes in various aspects of the social world by, for instance, extending police presence or enabling the net of surveillance to be cast even wider. In turn, drone policing is regulated by various activities which constrain its ability to perform these tasks. The documentary analysis of the emerging drone-enabled disruptions to many aspects of social and economic life in the UK, however, forced a re-imagining of the regulatory powers of drones. Widespread availability of drones on legitimate commercial markets, the handful of 'signal' drone crimes which have received global media coverage, and considerable gaps in enforcement mechanisms have created a space for 'centres of power' to emerge to rival the police. The initial proposition was therefore adapted in the light of these considerations to explain the emergence of drone policing in terms of the voluntary and internal regulatory mechanisms which programme members subscribed to/were subjected to. As a consequence of this understanding, subsequent research would be more alert to the regulatory mechanisms which condition drone policing.

Of course, these concluding statements are not the *only* explanations for the emergence of drone policing. As Bhaskar (2008) suggests, claims to absolute or definitive causal relations are unobtainable (even undesirable) in the social sciences given its relativist epistemology and the fallibility of knowledge (see also Chapter 4; Danermark et al 2002). Instead, it is important to reflect on these as explanations which are situated within a specific local context and related to a particular moment in time. It is entirely possible that alternative, even rival explanations could co-exist. This simultaneity of explanation is an appealing conclusion to be drawn because it encourages further programme specification (see Figure 1; Pawson and Tilley 1997: 85). There is a risk here of the type of constructivist spiralling that Pawson and Tilley

(1997: 21) criticise in their realistic evaluation model; that rivalling explanations co-exist and ‘we cannot, therefore, get beyond constructions’.

9.3 Speculations about drone policing

Theoretical understandings of drone technology

The fieldwork component to this study enabled rich insights into a burgeoning drone programme. It sought to advance theoretical understandings of how and why drone policing has been made possible within a single case study context. Due to the realist sensibility of this study which encouraged drawing upon a diverse range of literatures in order to firstly conceptualise the relationships between policing and drone technology and secondly to identify and explain these relationships within a specific empirical site, an ‘adaptive approach’ was adopted throughout (Layder 1998). Initial conceptualisations were modified, specified, and developed through close empirical study in order to generate empirically- and theoretically-informed knowledge.

The thesis intends to hold appeal at the intersection of police sociology, criminology, and the sociology of technology. This intersection reflects the disciplinary agnosticism which encouraged this thesis to conduct a broad, multi-disciplinary conceptualisation in Chapter 2 and continue to scan for relevant literatures in order to analyse subsequent data. It does not therefore fit ‘neatly’ within a single discipline or field. I suggest that such an endeavour would have been detrimental to generating theoretical knowledge because the adaptive approach taken throughout is a pragmatic rather than orthodox one (Layder 1998).

The methodological commitment to qualitative single case study makes a significant contribution to the field of police sociology. There is a well-worn ethnographic tradition of police sociology which has enlivened the study of this particular institution. The insights which were gained regarding the burgeoning drone programme and the substantial processes of change (even upheaval) which accompanied this seeks to invigorate the study of policing as it grapples with a dynamically unfolding techno-landscape. The police organisation is (perhaps unfairly) criticised as being resistant to change (see Innes 2013). Changes are oftentimes seen as being ‘done to’ police, whether because of political pressure, public outcry, or legislative developments which all exist externally to individual constabularies. What was revealed throughout this study, however, was an organisation willing and able to

innovate from the 'bottom up'. Empirical findings were therefore presented in a realist fashion (Van Maanen 2011) which permitted emic accounts of the programme to emerge. One of the most compelling contributions to the police sociology field emerges from the novel concept of enclaves of practice. This will hold relevance for other police sociologists dissuaded by the 'classical' cultural categories which define this area in Anglo-American studies (see e.g. Reiner 2010; also Loftus 2009). However powerfully enduring these categories may be, alternative means to conceptualise culture(s) can be beneficial for unpicking its heterogeneity, especially given the contemporaneous transformations to police in terms of enhanced specialisms and technologisation. These features, it can be argued, will shape their surrounding cultures much in the way that drones did in this case study.

The criminological appeal of this study resides in its critical engagement with the nature of power as it coincides with technological change. Current literature surrounding drone technology has concerned itself with an overly deterministic account of the capabilities of drones to invest (state) users with considerable degrees of power to intervene in subject populations. Arguments to the effect of a totalising drone 'enclosure' (Shaw 2016) and the panoptic effects of always-on surveillance (Wall and Monahan 2011; Neocleous 2013; Shaw 2016; Wall 2016) have legitimised concerns over privacy and the relentless creep of state control into everyday life. The 'boomeranging' of militarised drones from the global borderlands of the so-called war on terror into western liberal democratic spaces (Jensen 2016) has likewise raised fears over domestic drone regimes; unilateral, technologised regimes of control in which measures designed to incapacitate and subjugate are replicated *en masse*. As was demonstrated throughout this thesis, the power of drone policing is constrained in a number of significant ways. Not only are operating environments liable to shape drone deployments (such as heavy winds or rain forcing a drone to land, or metal deposits buried within the earth interfering with a drone's onboard navigation systems), but simple human error similarly impacts upon drone policing's efficacy. As was observed, failures, setbacks, operator errors, and technical faults afflicted the programme's transitionary process (see Chapter 6). Moreover, the distinct absence of conventional regulatory actors within the police organisation to govern and regulate police drones nationally resulted in internal and voluntary regulation from within. Whether or not police users ought to regulate themselves was a point of contention; however, it is important to reiterate that regulatory mechanisms were nonetheless put

in place in order to legitimise drone policing by its users. The circulatory, multi-centred nature of power was also discussed in relation to policing in a drone-enabled society (Edwards 2016). It is suggested here that drone-enabled crime and other harms are liable to continue to present themselves. The coming of the so-called 'smart city', commercial and government investments into technologising swathes of the UK, and the myriad ways in which the drone industry will disrupt social and economic life will only reveal further vulnerabilities (see Chapter 8). Understanding that power circulates in this way de-centres police as sole control agents and adds a realistic, if not pessimistic, perspective on how the near future is likely to materialise.

Furthermore, this study has taken place at a juncture in the study of emergent and disruptive technologies. We might think of this as the development from theorising and studying singular technologies in specific contexts toward recognising how and in what ways technologies combine, break apart, and re-combine across many contexts. Criticism of the expansion of facial recognition software simmers in the background and police are already trialling algorithmic, predictive crime mapping softwares. Personal data are endlessly captured via borderless online monitoring on commercial platforms, 3-D printing is outflanking usual mechanisms of firearms control, and tentative inroads are being made in the mass application of automation and machine learning. These are just some illustrative examples of technology-led crime and control. The challenge confronting research at the forefront of drone innovation resides in how these developments in allied technologies might impact upon future trajectories of drones. 3-D printed drones could subvert regulatory efforts in place in the UK since only recently. Drones capable of learning and acting increasingly without human input could automate routine police surveillance, particularly in a 'perch and stare' capacity. Facial recognition software could be married onto a drone platform, collecting and sorting subjects more efficiently but raising threats to privacy and proportionality. Whether or not these developments will come to pass, the core argument of this thesis remains. The powers which could be enabled by new forms of technology will be conditioned by the social contexts into which they enter. Considered, empirical study of these technologies *in action* will enable more fruitful insights into the relations which develop between the social and the technical. The strength of this study comes from its adaptive theory approach (Layder 1998) bolstered by a critical realist sensibility which moves from the realm of theoretical abstraction to the concrete-real, and back to abstraction in the form of

refined propositions about what makes drone policing possible. The refined propositions could, in their own way, serve as initial propositions for subsequent research in new contexts, seeking out further and alternative mechanisms to explain the relations which inhere within similar socio-technical systems.

Critical realist contributions to the evidence base: proposed context-mechanism-outcome pattern configurations

The discussion in Chapter 3 highlighted four potential barriers to incorporating evidence into practice. The first three – the nature and the availability of evidence, and organisational constraints – were identified by Bullock and Tilley (2009) and the fourth – lag – was developed in the light of the so-called 'emergent-ness' of the problem. These barriers are perhaps intractable dimensions to doing evidence-based research (and subsequently informing evidence-based practice) but the findings from the realist evaluation are intended to go some way toward addressing these concerns.

Appendix E provides a more detailed presentation of the findings from the realist evaluation dimension of the study. It is intended as a reference resource for practitioners using the context-mechanism-outcome pattern configuration (CMOC) model. The Appendix seeks to translate the research findings into knowledge which is intended to be adequate for practitioner purposes. The contexts and mechanisms are explained in a way which demonstrates how these might impact upon policing and decision making when considering a drone capability. The context of programme localism, for instance, raises questions around what types of drone equipment would be more suited to particular local operational needs. The requirements for an organisational structure which is likely to sustain innovation draws attention to how structures could be designed to nurture it through advocacy and the types of organisational resources which might be required. Findings related to a 'just' culture point to suggestions for recognising and challenging prevalent 'blaming' due to the opportunities for learning and increased safety. And findings on internal voluntary regulation suggest that use of drones might be more helpfully understood as a means to recognise the limits to drone deployment in everyday policing. No claims can be made to law-like regularities or certainties; different contexts may shape mechanisms in different, perhaps unpredictable ways. It includes a concise summary of the contexts underpinning drone policing, the mechanisms which enable or constrain its emergence, and the outcomes of these context-mechanism interactions. Each

mechanism is liable to produce positive and detrimental outcomes; these will be decisions which potential users of this research will need to address.

9.4 An agenda for future research

This study has offered empirical insights into a burgeoning drone programme but there are limits to the claims and contributions which this study can make. These revolve around the following challenges: the dynamically changing policing landscape; empirical research on technological innovation; research *with* police; and extending the remit of EBP. In terms of the realistic evaluation cycle, further research on the following areas would encourage further specification of how and why drone policing is made possible elsewhere and in different times (Pawson and Tilley 1997). The implications of these limitations for future research and enhancing the specificity of future claims about drone policing are as follows.

The landscape of contemporary policing is undergoing rapid and unpredictable shifts. New threats, risks, and harms are continuously evolving, as are the demands placed upon the police service. Calls to ensure the service can navigate this unpredictability through technological solutionism and further extracting as much value as possible from limited resources resonate. At risk here is that core policing functions are reduced down to technology-led interventions. What is gained from technology-led policing? What is lost? McGuire's (2018) criticisms of the so-called 'smart city' – life within hyperconnected, technology-infused urban space – revolve around nascent 'stultification' of smart city inhabitants. Is there a risk in terms of stultifying police forces, making them over-reliant on technological solutions to complex problems? Is there a risk of replacing the 'human in the loop', impacting upon much deeper public perceptions of legitimacy and subsequent consequences for consenting to be policed by technology? Is it possible to imagine instances whereby a technological solution is applied erroneously, breaching codes of professional ethics/standards and causing public protection issues? A flying drone might assist a commander directing on-the-ground resources during public disorder. But a flying drone cannot be *omnipotent* or, more accurately, human interpreters of the data being livestreamed to a remote controller cannot be; things will be missed in the commotion and people may be put at risk.

This study is a product and artefact of a specific moment in time. Findings and subsequent theory-building based on these are situated within the specific context of the study (Bhaskar 1998). As Chapter 6 illustrated, the drone programme had already undergone a process of trial and initial evaluation during its 'proof of concept' phase. The research was conducted after this – the concept had been 'proven' – and the programme was grappling with the transition into an eventual 'live' phase. Of course, this was not a straightforward process. Setbacks, criticism, technological failures, operator errors, and other workplace commitments harried the programme throughout my time in the field. At times, the eventual 'live' phase seemed ambitious or even imaginary. An effective 'measure' of drone policing could examine its degree of so-called 'saturation' (Rogers 2003). This would involve a quantification of, for example, how many drones are used by a programme, the level of funding and other resourcing attached to it, how many staff members are trained and qualified to fly, and so on. This could then be measured against other programmes elsewhere in England and Wales to determine a more accurate, national-level or multi-case study picture of drone policing.

The prevailing EBP paradigm, for all the criticism levelled at it, offers much to contemporary policing. Cleaves as it does to methodological strategies of randomised control trials and systematic reviews there is potential space for alternative methodologies (as presented in this thesis). A broader recognition by key EBP actors, such as the College of Policing, could champion the variety of methodologies and findings which can inform police practice at the local level. The issue of scalability of evidence could instead be considered in terms of understanding context-specific problems. Looking to the current transformations in police professionalisation, such as the three 'entry' routes into policing which are tied to undergraduate-level degree programmes hosted by universities across the UK, there is scope for smaller, undergraduate-level, single case studies about problems which matter to individual constabularies.

These indicative avenues for further research tie into the claims made by Pawson and Tilley (1997: ch. 5) concerning evaluative cumulation. Due to the specificity of the CMOCs which developed from this case study, empirical and theory-driven (adaptive) claims were made within this context. But the relations between policing and drones exist within an open system (Bhaskar 1978) and the conditions which shape drone innovation programmes elsewhere might be unknowable on the

terms of reference used throughout this study. The CMOC interactions, however, contribute toward further research and can set an indicative agenda for prospective researchers moving forward. By problematising the relationship between drones and policing and by taking the social and the technical as separate but related areas of inquiry, this thesis has arrived at a set of explanations which simplify the processes which have led to the emergence of drone policing. Further evaluation research committed to ethnographic-based case study can specify other programmes, exploring the ways in which practitioners and users of drones invest in innovation, perceive and understand it, and what types of facilitators and barriers are present. It is intended that the theoretical knowledge which has emerged from this study can serve as an instructive middle-range theory; a set of principles with some generalisable utility that could undergo similar adaptation in other empirical contexts.

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Appendix A: Documentary analysis sources

Author[62]	Year	Title
Association of Chief Police Officers	2009	Police Air Operations: A review of the national strategy
Association of Chief Police Officers	2005	Mind the (Level 2) Gap
Association of Police and Crime Commissioners & National Police Chiefs' Council	2016	Policing Vision 2025
Case study force	2019	Operational Delivery Plan 2019/20
Case study force	2018	Representative workforce strategy
Case study force Police and Crime Commissioner	2017	Police and Crime Plan
Cavallaro, J. et al.	2012	Living Under Drones: Death, Injury, and Trauma to Civilians From US Drone Practices in Pakistan
Civil Aviation Authority	2019	The Drone and Model Aircraft Code
Civil Aviation Authority	2019	Unmanned Aircraft System Operations in UK Airspace – Guidance (CAP 722)
Civil Aviation Authority	2019	Unmanned Aircraft System Operations in UK Airspace – The UK Recognised Assessment Entity (Cap 722B)
Clarke, C.	2006	Police Force Restructuring
College of Policing	2020	Policing in England and Wales: Future Operating Environment 2040
Comparing Police and Crime Commissioners	2017	Drones in policing
European Commission	2014	Communication from the Commission to the European Parliament and the Council: A new era for aviation: Opening the aviation market for the civil use of remotely piloted aircraft systems in a safe and sustainable manner
Haylen, A.	2019	Civilian drones (House of Commons Briefing Paper CBP 7734)
Home Office	2013	Surveillance Camera Code of Practice
HM Government	2017	Industrial Strategy: Building a Britain fit for the future. White Paper
HM Government	2019	UK Counter-Unmanned Aircraft Strategy
HM Inspectorate of Constabulary	2005	Closing the Gap: A review of the 'fitness for purpose' of the current structure of policing in England & Wales
HM Inspectorate of Constabulary	2015	Reshaping policing for the public

[62] Sources which identify the case study force have been anonymised.

HM Inspectorate of Constabulary and Fire & Rescue Services	2017	Planes, drones and helicopters: An independent study of police air support
HM Inspectorate of Constabulary and Fire & Rescue Services	2020	State of Policing – The Annual Assessment of Policing in England and Wales 2019
Home Office	2013	Surveillance Camera Code of Practice
Home Office	No date	National Intelligence Model code of practice
House of Commons Home Affairs Committee	2005	Police Reform, Fourth Report of Session 2004-05 (volume 1)
National Police Chiefs' Council, Civil Aviation Authority, Home Office, and Department for Transport	2016	Memorandum of Understanding
Police Foundation	2016	The governance of supra-force specialist policing capabilities: A review by the Police Foundation
PwC	2018	Skies without limits
Specialist Capabilities Programme Team	2016	Phase One Report
Surveillance Camera Commissioner	2017	A National Surveillance Camera Strategy for England and Wales

Appendix B: Project information sheet

Project Information Sheet

Contact details
Michael Coliandris
Cardiff University
School of Social Sciences
1 – 3 Museum Place
CF10 3BD
Email: coliandrism@cardiff.ac.uk

Key information
This project is being conducted by a doctoral research student at the Cardiff University School of Social Sciences. The project is part of a PhD thesis, and will be submitted in September 2020. The project is funded by the Economic and Social Research Council (ESRC), and supervised by Professor Trevor Jones and Dr Adam Edwards at the Cardiff University School of Social Sciences. An ethics approval form will be submitted to the University Research Ethics Committee once access to respondents has been agreed.

What is the project about?
Technological innovation is a key focus of expenditure for police forces given the potential it has to augment policing, particularly in the context of cuts in police staffing numbers. Practitioners will be familiar with 'evidence-based policing' and the associated 'What works?' movement, but the current evidence base about the use of drones in policing is limited given the recent and rapid development of this technology. The 2017 review conducted by HM Inspectorate of Constabulary and Fire & Rescue Services *Planes, drones and helicopters*[63] concluded that no individual force had 'rigorously evaluated their use'.

This is an important conclusion, and this project comes at an important time in British policing. Finding out 'What works' and developing a strong evidence base which is locally relevant to constabularies such as _____ Police will, in turn, provoke interest in evaluating drones more generally across England and Wales. The conclusions I draw, with input from _____ Police, can support further research so that drones can be used more safely, efficiently, and effectively in support of police tasks.

Why is the project important?
The opportunities drones present for policing are considerable, and the current view of the police service and policy makers is that police forces should look to drones to help deliver police tasks more effectively. Assistant Chief Constable Steve Barry, national lead on drones, has argued that drones will 'transform' policing, and suggested that a new type of policing is emerging: one that is mobile, aerial, technologically advanced, and remotely controlled. Understanding whether and how this transformation is occurring amongst practitioners and what impact it is having upon operational and strategic decision-making in the police is a key area of interest

[63] https://www.justiceinspectorates.gov.uk/hmicfrs/wp-content/uploads/planes-drones-and-helicopters-an-independent-study-of-police-air-support.pdf

to me, and the proposed study will allow for evidence-based reflections on how best to improve policy and practice.

The What Works Centre for Crime Reduction offers a useful set of resources for practitioners, academic researchers, and policy makers. Its Research Map highlights current research being conducted related to policing and crime reduction. The Crime Reduction Toolkit similarly provides evidence for the effectiveness, costs, benefits, and implementation strategies of crime reduction initiatives. Conclusions of these evaluations are generally informed through national-level, large-scale research studies which present significant opportunities but also some disadvantages for local-level evaluations. Most significantly, a Home Office study conducted in 2002[64] on the effects of CCTV on crime reduction rates found that CCTV's effectiveness depends upon particular contextual conditions which enable them to reduce crime. In this example, CCTV had statistically significant effects on vehicle crime reductions, but the same could not be said for reductions on public transport or some city centres. This study, because it aggregated a large number of large-scale evaluation studies, could not account for these local contextual differences of CCTV deployment which might otherwise explain why CCTV might work in some circumstances, and not others. The relationship between technology and crime prevention is strong, but not always clear. The conclusion we can draw is that some technologies work to reduce crime in some contexts, but not others. Relating this to drones, I suggest their effectiveness for crime reduction, as well as the other functions they perform such as search and rescue, are also closely connected to the context in which they operate.

A recent review[65] of the Centre found strong support for forging partnerships between academic researchers and practitioners. However, it noted that police chiefs were sometimes reluctant to implement some 'evidence-based' initiatives because they lacked 'local relevance'. The lack of locally relevant evaluations of drones in policing presents an opportunity for this research project to make an important contribution to the knowledge base for police forces more generally. It also has the potential to make a significant contribution to the academic study of policing.

The current state of the project

I am currently carrying out a literature review of technological innovations within the police and their impact upon operational policing. Regarding innovation, there has been strong evidence which suggests that technologies only offer benefits such as improving efficiency and enabling better police-community relations if the technology in some way 'speaks to' the occupational culture. In other words, police officers will only make the best use of a technology if they can see that it relates to their work and their identity as police officers. Many academics have conducted research with police forces across England and Wales, providing a strong evidence-base for me to work with in developing a series of propositions about the relationship between technology and policing. These studies have used interviews and observations with police members which highlight important cultural aspects of the police occupation. I propose that it is these cultural aspects which provide the context in which drones 'work'.

[64] http://www.popcenter.org/Responses/video_surveillance/PDFs/Welsh%26Farrington_2002.pdf
[65] http://www.icpr.org.uk/media/43599/icpr_final_evaluation_wwccr.pdf

At this stage I am also interested in receiving feedback on these ideas from specialists currently using drones, to both engage constabularies with the proposed research and to enhance its relevance for decisions about future drone use.

I would be very interested to receive feedback from officers in _____ Police about current priorities and challenges for the constabulary's use of drones, including any lessons which have been learned from the deployment of these to date. For example,

- What, if any, unforeseen challenges have arisen?
- What areas of police work have benefited from the use of drone technology?
- Whether drones have proven useful in policing some areas, such as rural spaces, but not in others, such as urban air space?

Methods

In order to carry out the proposed project, I would hope to gain access to ____ Police staff directly involved in operating drones to conduct interviews and observations of drones being used. I would also be interested in interviewing stakeholders in the higher ranks to study _____'s strategic plans for drones. A proposed timeline is included below, but in order to gather good data I would be interested in studying over the period July 2018 – December 2019, dependent upon if/when I receive approval to start the study. The method is informed by previous academic research on the police.

Over the proposed 18 month research period, I would seek to gain access to specialist drone users to observe their activities. Observing drone use operationally would be the ideal circumstances in which I can gather good data which may hold relevance to informing police practice. I would also be interested in observation of drone users in other circumstances, such as during training or when they are based at the station to produce a more thorough set of data about the general practice of drone policing in this context.

I would also like to carry out interviews of around 1 hour with these drone users at certain stages of the research project, as well as with other related members of _____ Police who would be in a position to discuss drones at the operational and strategic level. At the operational level, interviewing the drone users who I have previously observed will provide an opportunity to follow up on any interesting or significant events which were previously observed. Interviews will also enable participants to engage with the research by drawing my attention to opportunities and challenges which they might have experienced so that I can focus my research efforts on these areas. At the strategic level, interviewing ____ staff who are responsible for the planning, funding, training, and so on of police drones would provide me with a wider perspective of the opportunities and challenges presented by drones as they relate to strategic thinking and planning.

In the effort to make this project locally relevant, carrying out observations and interviews for 18 months will allow me to get a good understanding of how drones are used by _____ Police specialist staff, gather their thoughts on the opportunities (and potential challenges) they experience at work, as well as gather data at the strategic level. Understanding how strategic thinking and operational deployments connect in practice is significant.

Considerations

The research will be carried out in agreement with _____ Police and in accordance with Cardiff University School of Social Sciences' Research Ethics Committee guidelines. Following feedback from _____ Police, I will be in a position to clarify the ethics of the project for this Committee ahead of a preferred start date of summer 2018. The following ethical issues will be addressed:

- Informed consent – all participants will be provided with a Participant Information Sheet which will outline the purpose of the project and the conditions of their participation, which they will be asked to sign as proof of their understanding. Participants will be able to withdraw their consent at any time during the course of the project. No part of this project will be conducted covertly or without the consent of participants.
- Harm to participants – harm comes in many forms. Anxiety and stress, physical harm, invasions of privacy, and breaches of confidentiality are key ethical considerations. To minimise the potential for harm, all data will be stored and treated confidentially and participants will understand that their participation is voluntary and that they can withdraw at any time.
- Privacy – all participants will be anonymised as thoroughly as possible. I will refer to them in the write up of the project using pseudonyms. All data will also be stored on Cardiff University's servers and will be transcribed by myself. In the interests of ensuring the project receives ethics approval, I also propose to anonymise '_____ Police', instead referring to 'a force using drones in England and Wales'. This will not reduce the project's impact, as the main analytical points (such as the circumstances drones work in, the opportunities and challenges they might present for certain police activities) will still generate locally relevant data.

Appendix C: Ethical approval letter[66]

[Redacted]

[66] Note that the final thesis title was amended since receiving this Approval letter to reflect the evolving argument of the thesis. The ethical considerations for which approval was granted remain accurate and representative.

Appendix D: Information for participants

Information for Participants (Observations)
[Police Members]

A study of the police use of drones

About the project
This project aims to explore how unmanned aerial systems (drones) are being used by specialist operators at _____ Police. Investments in technology are a key source of expenditure for police forces given its potential to augment policing, particularly in the context of cuts in police staffing numbers. Practitioners will be familiar with 'evidence-based policing' and the associated 'What works?' movement, but the current evidence base about the use of drones in policing is limited given the recent and rapid development of this technology. The 2017 review conducted by HM Inspectorate of Constabulary and Fire & Rescue Services *Planes, drones and helicopters* concluded that no individual force had 'rigorously evaluated their use'.

This is an important conclusion, and this project comes at an important time in British policing. Finding out 'What works' and developing a strong evidence base which is locally relevant to constabularies such as _____ Police will, in turn, provoke interest in evaluating drones more generally across England and Wales. The conclusions I draw, with input from _____ Police, can support further research so that drones can be used more safely, efficiently, and effectively in support of police tasks.

About the researcher
My name is Mike Coliandris and I am a doctoral research student at Cardiff University. This project is part of my PhD thesis, and is supervised by Trevor Jones and Adam Edwards at the Cardiff School of Social Sciences. The UK Economic and Social Research Council (ESRC) funds this project.

Why have you been asked to participate?
Due to your role as a drone operator, I am interested in observing you using drones on policing operations and in training. I am also interested in your views on technology and how they impact upon your work, so also wish to spend time with you during your working hours. As you have experience of using drones, your views on their effectiveness are important for me to be able to evaluate whether drones are achieving their stated aims. Spending time with you, and how you interact with your colleagues, will also give me some insight into how the culture at _____ Police shapes the ways you use drones. It will also show me how drones impact upon your work routines.

What would your participation involve?
I would like to observe you during your work routine. In particular, I would like to observe you when you are using drones, either operationally (such as in response to a police incident) or during training. I would also like to spend time with you when you are not using drones, such as when you are in the police station or on patrol. My research should not interfere with you or your work, but I may ask questions during the observations to help clarify something.

Your rights as a participant
Your participation is voluntary and, if you choose to participate, you can withdraw at any time and do not need to provide a reason. You will also be given the opportunity to have the information you provided to me removed from the study before it is published. Before the observations begin you will be asked to sign a consent form confirming your participation.

What will happen to the information you provide?
The information will be stored on University servers and/or in a locked filing cabinet, and will be retained for no less than 5 years after the end of the project. Extracts from the notes I make during observations may be included in the PhD thesis, but any personal identifying information about you will be anonymised. I would also like to communicate my research to other academics and to policy makers, so may use this information in conference presentations and journal articles. It is also University policy to publish a copy of completed PhD theses online. The information you provide will be anonymised to the greatest extent possible, but close associates may be able to identify you. Your name and personal identifying details will not be included in publications.

Contact details
If you would like more information, please do not hesitate to contact me. My details are:
Mike Coliandris
Cardiff School of Social Sciences
Cardiff University
1-3 Museum Place
Cardiff
CF10 3BD
Email: ColiandrisM@cardiff.ac.uk

Information for Participants (Interviews)
[Police Members]

A study of the police use of drones

About the project

This project aims to explore how unmanned aerial systems (drones) are being used by specialist operators at _____ Police. Investments in technology are a key source of expenditure for police forces given its potential to augment policing, particularly in the context of cuts in police staffing numbers. Practitioners will be familiar with 'evidence-based policing' and the associated 'What works?' movement, but the current evidence base about the use of drones in policing is limited given the recent and rapid development of this technology. The 2017 review conducted by HM Inspectorate of Constabulary and Fire & Rescue Services *Planes, drones and helicopters* concluded that no individual force had 'rigorously evaluated their use'.

This is an important conclusion, and this project comes at an important time in British policing. Finding out 'What works' and developing a strong evidence base which is locally relevant to constabularies such as _____ Police will, in turn, provoke interest in evaluating drones more generally across England and Wales. The conclusions I draw, with input from _____ Police, can support further research so that drones can be used more safely, efficiently, and effectively in support of police tasks.

About the researcher

My name is Mike Coliandris and I am a doctoral research student at Cardiff University. This project is part of my PhD thesis, and is supervised by Trevor Jones and Adam Edwards at the Cardiff School of Social Sciences. The UK Economic and Social Research Council (ESRC) funds this project.

Why have you been asked to participate?

Due to your role as a drone operator, I am interested in hearing your thoughts on how drones are impacting upon your work. As you have experience of using drones, your views on their effectiveness are important for me to be able to evaluate whether drones are achieving their stated aims.

What would your participation involve?

I expect these interviews to last between 30 and 45 minutes and will be digitally recorded and transcribed by myself. I will carry out these interviews at a time and place which suits you. You will not need to prepare in advance.

Your rights as a participant

Your participation is voluntary and, if you choose to participate, you can withdraw at any time and do not need to provide a reason. You will also be given the opportunity to have the information you provided to me removed from the study before it is published. Before the interview begins you will be asked to sign a consent form confirming your participation.

What will happen to the information you provide?
The information will be stored on University servers and/or in a locked filing cabinet, and will be retained for no less than 5 years after the end of the project. Extracts from the interview may be included in the PhD thesis, but any personal identifying information about you will be anonymised. I would also like to communicate my research to other academics and to policy makers, so may use this information in conference presentations and journal articles. It is also University policy to publish a copy of completed PhD theses online. The information you provide will be anonymised to the greatest extent possible, but close associates may be able to identify you. Your name and personal identifying details will not be included in publications.

Contact details
If you would like more information, please do not hesitate to contact me. My details are:
Mike Coliandris
Cardiff School of Social Sciences
Cardiff University
1-3 Museum Place
Cardiff
CF10 3BD
Email: ColiandrisM@cardiff.ac.uk

Participant Consent Form

Contact details
Michael Coliandris
Cardiff School of Social Sciences
Cardiff University
1-3 Museum Place
Cardiff
CF10 3BD
Email: ColiandrisM@cardiff.ac.uk

	Please initial
I confirm that I have read and understood the Information Sheet for the study. I have had the opportunity to consider the information, ask questions, and have had any questions answered to my satisfaction.	
I understand that my participation is voluntary and that I am free to withdraw from the study at any time and do not need to provide a reason. I also understand that I can withdraw the information I provided at any time and do not need to provide a reason.	
I understand that colleagues may be able to recognise me from the information I provide, but that the information will be treated confidentially to the greatest extent possible.	
I agree to take part in the study.	

……	……..	…….
Name of Participant	Signature	Date
……	……..	…….
Name of Researcher	Signature	Date

Appendix E: Realist evaluation findings about drone policing

Context	*Mechanisms*	*Outcomes*
1. Local drone delivery		
Majority of forces have access to a drone capability, whether as principle owners or through sharing arrangements with neighbouring forces and/or local Fire and Rescue Services. Programme differentiation defines the current state of drone policing nationally. In the wake of HMICFRS (2017) criticism of NPAS national air support arrangements, drones offer a cheaper, more efficient, and consistent route to access air support in many operational circumstances.	▪ Acquire drones suited to local operational environments. ▪ Responsibilities to Civil Aviation Authority.	▪ Develop programmes to meet particular local needs and consider local pressures (e.g. budgets, resources, operating environments). ▪ Responsible to agency outside of police organisation. ▪ Enable effective partnership working (i.e. inter-force resource- and knowledge-sharing). ▪ Consequences for service provision and public perceptions of legitimacy and appropriateness.
2. Organisational surroundings		
Drones do not behave unilaterally; organisational resources are required in order to support and sustain a burgeoning programme of innovation. Innovation programmes are also liable to setbacks which can affect confidence and be justification for reducing funding or blocking future development.	▪ Advocacy. ▪ Professional involvement with innovation programmes.	▪ Drone advocacy can generate support from within the organisation. ▪ Can have unintended effects (i.e. perceptions amongst critics/sceptics of 'evangelism' or proselytising). ▪ Setbacks and failures are amplified. ▪ Risk to reputation if involved with a failing programme. ▪ Programme management requires organisational resources to sustain the programme.
3. A culture of learning and safety		
Prevailing cultural norms and values can disrupt the extent to which drone technology will 'fit' with occupational members.	▪ 'Real' policing.	▪ Drones replace need to engage in (some) kinetic, risky policing tasks. Consider benefits to officer safety. ▪ Existential threat to identity – can result in criticism, lack of stakeholder buy-in.

	▪ Learning and safety.	▪ Drone programmes will experience setbacks and failures. A 'just culture' can limit the detrimental consequences of this by encouraging openness and learning from failure. Individual and systemic problems can be more efficiently diagnosed and addressed in a just culture.
4. Internal and voluntary regulations		
The absence of conventional regulations over drone policing has invested local programmes with a significant degree of power to self-regulate.	▪ Extend capabilities.	▪ Just as drones augment many areas of police work, drones also enable and empower other user groups. The nature of policing is changing and so is the nature of drone-enabled crime.
	▪ Colonise and permeate space.	▪ Drones are more likely to be effective operational tools in some spaces compared to others. ▪ Operating spaces are negotiated; drone efficacy is not automatic.
	▪ Data collection.	▪ Internal and voluntary surveillance regulations can monitor police users, providing additional layers of accountability to the programme.