



**Operating at the Speed of Challenge:  
Adaptive C2 as a New Paradigm for Police  
Command and Control at Critical  
Incidents**

**Simon O'Rourke  
Herman B. "Dutch" Leonard**

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## About the Authors

**Simon O'Rourke, Ph.D.**, is a Police Inspector currently assigned to the Counter Terrorism and Emergency Response Command at the Western Australia Police Force. He was awarded a Fulbright Postdoctoral Scholarship in 2017 and he spent the 2017/18 academic year as a fellow with the Program on Crisis Leadership (PCL) at Harvard Kennedy School. His research has focused on the way in which police prepare for and respond to major incidents, with a particular focus on command of such events.

**Herman B. "Dutch" Leonard, Ph.D.**, is the George F. Baker Professor of Public Management at Harvard's Kennedy School of Government and faculty Co-Director of the Kennedy School's Program on Crisis Leadership, and the Eliot I. Snider and Family Professor of Business Administration and Co-Chair of the Social Enterprise Initiative at Harvard Business School. He served at the Kennedy School as an Academic Dean from 1992 to 2000. He teaches about leadership, crisis management, and risk management at both the Kennedy School and Harvard Business School. He is the faculty co-chair of the Kennedy School's Leadership in Crises executive program, of the General and Flag Officers executive program, of the Leadership in Homeland Security executive program, and of the joint Kennedy School and Harvard Graduate School of Education executive program on crisis management for higher education institutions. He was a member of the World Economic Forum Global Agenda Council on Catastrophic Risk from 2008 to 2012. He has provided advice to numerous international, national, state, provincial, local, nonprofit, and private organizations and executives about risk management and crisis leadership and preparation and recovery. He is a member of the board of trustees of the American Repertory Theater and was a member of the board of directors of Harvard Pilgrim Health Care, a 1.2 million member Massachusetts nonprofit health insurance company, and of the boards of directors of the American Civil Liberties Union of Massachusetts, of the Hitachi Foundation, of the Massachusetts Health and Education Facilities Authority, and of Civic Investments. He is the co-editor and co-author of *Managing Crises: Responses to Large-Scale Emergencies* and of *Public Health Preparedness: Case Studies in Policy and Management*, and co-author of *Capitalism at Risk: Rethinking the Role of Business*, among other books and articles. He received his PhD in economics in 1979 from Harvard. He enjoys skiing, playing the guitar, hiking, and observing wildlife.

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# **Operating at the Speed of Challenge: Adaptive C2 as a New Paradigm for Police Command and Control at Critical Incidents**

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"Failure is not an option" is the title chosen by Gene Kranz for his 2000 book detailing his time as the Flight Director in NASA's Mission Control Centre. It could just as easily describe community and government expectations of the police during a significant law enforcement event. Policing agencies use a variety of terminology to describe such incidents. To simplify, this paper will use the term 'critical incident' to cover the range of incidents for which some form police command and control (C2) framework is likely to be required. A critical incident is defined as, "Any incident where the effectiveness of the police response is likely to have a significant impact on the confidence of the victim, their family and/or the community" (Metropolitan Police, 2016, p. 2). This definition clearly encapsulates the importance of the police relationship with the community and how pivotal trust is to that relationship. How police are perceived to have performed during high profile incidents, where there are clear community expectations will have significant long term impacts. It is therefore incumbent upon police organisations to ensure that the commanders they deploy to a critical incident are the right people, capable of performing at highest levels.

The wide array of circumstances encompassed within the broad category of critical incidents, ranges from relatively simple and familiar to highly complex and unusual. Using such a broad term thus conflates circumstances – and their consequent law enforcement challenges – that are wildly different from one another and which therefore may require substantively and procedurally different police responses. The critical incident terminology focuses on one dimension of the outcomes – that public trust and confidence in police may be affected – rather than on the underlying nature of the problem itself, thus implicitly treating all events where public trust is at risk as if they were similar.

In this paper, we take a different stance. We argue that it is vitally important to distinguish among different critical incidents by the nature of the challenges they present, because different complexes of challenges will require significantly different approaches in command structures and procedures. Or, to look at it from the other direction, when we make the right distinction among different types of events within the broad category of critical incidents, we are then *enabled* to devise appropriately different forms of response in both structure and process.

Following Howitt and Leonard (2009), we maintain that the key distinction within the broad category of critical incidents is the degree of novelty and/or unfamiliarity of the challenges presented. Incidents in which there are significantly novel elements present responding police officers and organizations with a materially different type of problem to address and importantly call for different approaches, organizational structures, processes, and capabilities for their successful resolution. They also should be viewed – by the public, media, politicians, and review boards – through a different lens of expectations and understandings about what the characteristics of the response and the substantive outcomes may be ... both during and (perhaps especially) after the fact.

Policing agencies by their very nature have significant experience in dealing with what can be termed routine emergencies. These types of incidents usually require some form of urgent response and subsequent action by attending police, and the outcome is generally dependent upon the actions taken by the officers responding, but they occur frequently enough to present a degree of familiarity. This in no way detracts from the danger they may present, or the challenge police may face in dealing with them. However, they are by their very nature expected and therefore most police agencies acknowledge their likelihood and prepare and train accordingly (Howitt & Leonard, 2009).

A crisis is something quite different. The very term itself conjures up images of calamity and a lack of control; this may be the reason why the word is not in common usage in policing. It sits at odds with the confidence presented to the public by senior police and elected officials during such incidents. A crisis differs from a routine emergency as a result of the significant aspects of novelty it contains (Howitt & Leonard, 2009). This presents a challenge to police commanders: unless they identify that the incident is indeed a crisis and adapt their approach and mindset accordingly, the outcome will likely be poor, relative to what should have been possible. To overcome this the police commander must resist the temptation to view the event as routine and thus to focus immediately on taking some form of action (though of course the immediacy of the threat may necessitate some immediate actions, while a wider view of the situation is formulated and a broader approach to it is developed). Instead, the police commander and their team should first seek to define and frame the problem they are faced with. Any attempt to resolve the incident without first considering the problem more broadly is unlikely to be successful. This will require a new approach to existing systems, training and culture within police organisations if it is to be successfully adopted. Australian police agencies currently use an incident management system (IMS) framework to provide C2 during a critical incident. The IMS framework as used by police has only evolved incrementally since its conceptualisation in the early 1970s, when it was created in response to the threat posed by wildfires in California. This hierarchical and bureaucratic structure developed nearly 50 years ago is not fully suited to the future problem sets police will be confronted with. We therefore have an opportunity to review the current police C2 framework, consider what form future challenges may take and develop a new C2 paradigm to prepare for them – before the next novel incident arises.

An obvious driver of this need is that the threat environment is continually evolving, and by its nature differentially presents novel challenges. Ideologically motivated offenders and transnational crime groups pose increasingly significant challenges due to the geographic range, speed and agility at which they now can operate by taking advantage of modern communications, public networks, and information technologies. Organized crime and terrorism present challenges with a high level of novelty because it is in their obvious interest to do so – as intelligent adversaries, it is clearly evident to them (and should be to us as well) that introducing novelties is one of the few advantages they can use to gain an even temporarily upper hand.<sup>1</sup> Traditional C2 structures and organisational charts are highly constrained and unsuited to the dynamic nature of this space, due to rigid reporting lines that (among many other weaknesses) inhibit the speed at which time sensitive information can be passed. Policing organisations will need to adopt new approaches to C2 that support and enable those commanders who are required to make critical decisions in temporally constrained environments. The utilisation of a bureaucratic C2 structure remains the standard for police incident response, particularly in Australia. This paper will challenge this approach as sub-optimal for the contemporary policing environment, where the threat is human, highly agile and capable of initiating events, not merely responding to them. Optimisation against an adversary of this nature requires a highly adaptive C2 paradigm that is capable of morphing during the incident to ensure the maximum delivery of capability.

## **Evolution of C2 Systems**

Command and control is defined as, “The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission” (Department of Defense, 2018, p. 43). This definition is highly relevant to policing, as the police commander exercises lawful authority by virtue of legislation and is responsible for the development and implementation of the plans to achieve the mission. An effective C2 system must be capable of providing situational awareness to the commander; thereby enabling them to make the best possible decisions within evolving timelines (Joint Chiefs of Staff, 2017). As one of us (Leonard) has regularly observed to emergency management classes, effective leadership in a crisis situation can be viewed as, “a good enough decision - soon enough to matter - communicated well enough to be understood - carried out well enough to work.” C2 is not a new phenomenon, but understanding its historical origins may be helpful when considering how it may be best adapted for future challenges.

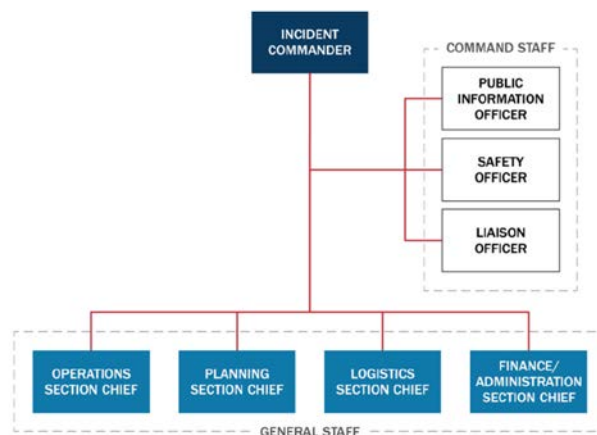
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<sup>1</sup> We like to make this point by observing that the less skilled offenders are in jail, or subject to ongoing investigations, surveillance by intelligence agencies or court approved monitoring ... It is the smart ones (and the new initiates) who are our remaining adversaries ... and they are smart enough to realize that if they continue to show us the same things they have shown us before they will get caught as well. They learn from law enforcement and intelligence methodologies exposed during criminal trials. Adversarial situations are, thus, likely to present a high degree of novelty (compared, for example, to natural disasters ... though these can also occasionally present unfamiliar new challenges).

C2 systems can trace their origins to the earliest records of warfare, and systems are predicated upon the communications technology available at the time (Creveld, 1985). The evolution of C2 systems and future developments in this space remains an area of study by both scholar and practitioner. Reviewing these studies, a clear and consistent theme emerges: the functions and purpose have remained constant, whilst the systems themselves have continued to evolve and develop. Advances in communications technology in terms of bandwidth and reach have mitigated the need for the commander to be physically present at the battlefield, whilst exponentially increasing the size of the force they could command (Creveld, 1985). Napoleon is credited with significantly advancing the inherent capabilities of traditional, hierarchical C2 during his time. Despite facing the same technological constraints as his adversaries, he chose to embrace uncertainty and devolved authority to a point in the hierarchy where decisions could be made to seize initiative without continual referral to a higher authority for approval, relying significantly more than his predecessors on what management theorists now term “decentralized intelligent adaptation” by lower level commanders. These tactics allowed his forces to exploit opportunities in real time, something that worked against his opponents who tended to adhere to a strict hierarchical structure and sought to retain complete control at all times (Creveld, 1985).

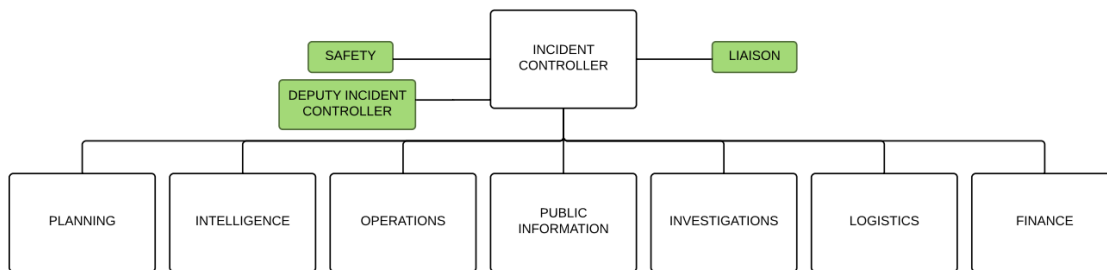
### The Current (Static, Traditional) C2 Framework

The current C2 framework used by Australian police can trace its history back to the early 1970’s. Its origins lie in pioneering work by U.S. firefighters seeking to enhance agency interoperability when fighting wildland fires in California. Their work resulted in the development of the Firefighting Resources of California Organized for Potential Emergencies (FIRESCOPE). The subsequent integration of the National Wildfire Coordinating Group and FIRESCOPE resulted in the creation of an interagency incident management system. This system has evolved post 9/11 into the current National Incident Management System (NIMS) used across the United States today. An example of the NIMS structure with a single agency in charge of an incident is shown as Figure 1.0 (Federal Emergency Management Agency, 2017, p. 25).



**Figure 1.0:** Example of an ICS structure with a Single Incident Commander (FEMA, 2017)

Adaptations of this system are now used across the globe, including in Australia, where fire and emergency management agencies and police have adopted a similar structured approach.<sup>2</sup> The Australasian Inter-Service Incident Management System (AIIMS) is the system used by fire and emergency services in Australia. It has undergone a series of revisions and the latest AIIMS – 2017 (Adapted from Ferguson, 2017) is structured as follows:

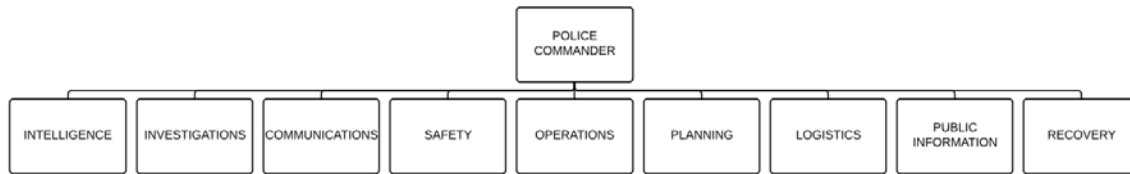


**Figure 2.0** AIIMS – 2017 (Adapted from Ferguson, 2017)

AIIMS - 2017 is well suited for fire and emergency management environments and it is supported by training and doctrine outlining key roles and functions. Doctrine can be described as the fundamental principles that provide a pathway that enables a unified and synchronised approach to achieving a defined objective (Joint Chiefs of Staff, 2018). Whilst Australian police do not routinely utilise this doctrine as such, they are supported by the Australia New Zealand Policing Advisory Agency (ANZPAA), which provides broad guidelines for incident management. These guidelines are designed to assist police agencies to meet their responsibilities when leading or working as key partners with other emergency services and government organisations during a major incident or crisis. To ensure interoperability and align with the existing AIIMS – 2017 framework, Australian police adopted a framework from ANZPAA called the Incident Command and Control System Plus (ICCS Plus).

<sup>2</sup> It is perhaps most insightful to view the US NIMS and Australian AIIMS structures as the product of co-evolution. The wildland fires that take place in California on a recurring basis are very similar to those in the Australian bush (especially those in New South Wales). (This results in part from climate similarities, and in part from the fact that Australian eucalyptus trees were deliberately introduced in California in the 1800s as a source of fast-growing resinous rot-resistant wood for railroad ties, and rapidly spread throughout wildland areas in the state, so that both the climate and vegetation – and, therefore, the characteristics of the resulting fires – are very similar. Since the fires are seasonal, and Australia and California have opposite seasons, there has long been a high degree of cooperation and exchange of best practices among Australian and California wildland fire-fighting organizations, with fire crews visiting their opposite numbers on the other side of the equator during their “off” season and sharing and discussing and developing structures, practices, and procedures for more effective wildland and fire management.

An outline of the ICCS Plus framework is shown below as an organisational chart to help illustrate the similarities with the AIIMS-2017.



**Figure 3.0** ICCS Plus

All the preceding systems can be traced back to the pioneering work of FIRESCOPE in the 1970's. They share commonalities, including a hierarchical structure with clearly defined responsibilities and lines of command and control. The Australian systems have continued to expand by adding additional functions/nodes in response to operational demands, when managing complex incidents. These frameworks have proven their suitability for fires and natural disasters, where there is a degree of predictability or previous experience with the problem set they are faced with.

The seeming hierarchical emphasis of these systems (as viewed through their wiring diagrams) belies to some extent how they actually function, however – they tend to operate in a less hierarchical way than their diagrams suggest. Even though (natural [as opposed to arson-generated]) fires are non-adversarial and therefore seemingly more routine and familiar, large and complex fires managed through a highly-centralized traditional C2 system still create the problem of overwhelming the center with the details of a highly complex and heterogeneous problem surface. As they have evolved to cope with this reality, these hierarchical-looking systems actually are better viewed as collaborative, with the center acting in support of decentralized adaptive units (similar to the military approach devised by Napoleon. Another way to view this would be to say that all large, complex, heterogeneous problems are different from all others ... that is, with complexity and heterogeneity come intrinsic novelty. Thus, only small, really familiar problems can be seen as truly routine ... and therefore are the only situations in which a strict execution-oriented traditional C2 structure is likely to apply.

### **C2 Challenges and Constraints**

These same structures are even less suitable when faced with the level of complexity posed by a human adversary, where there is little or no predictability and limited precedent against which to benchmark critical decisions. In seeking to restore the appearance of control in the midst of such a crisis there is a degree of comfort that can be gained in these familiar structures, even when their effectiveness is debatable (McChrystal, Collins, Silverman, & Fussell, 2015). This is due to the speed at which a human adversary can independently operate, potentially placing them inside the police commander's decision-making "OODA Loop," reducing the effectiveness of police actions and denying them the



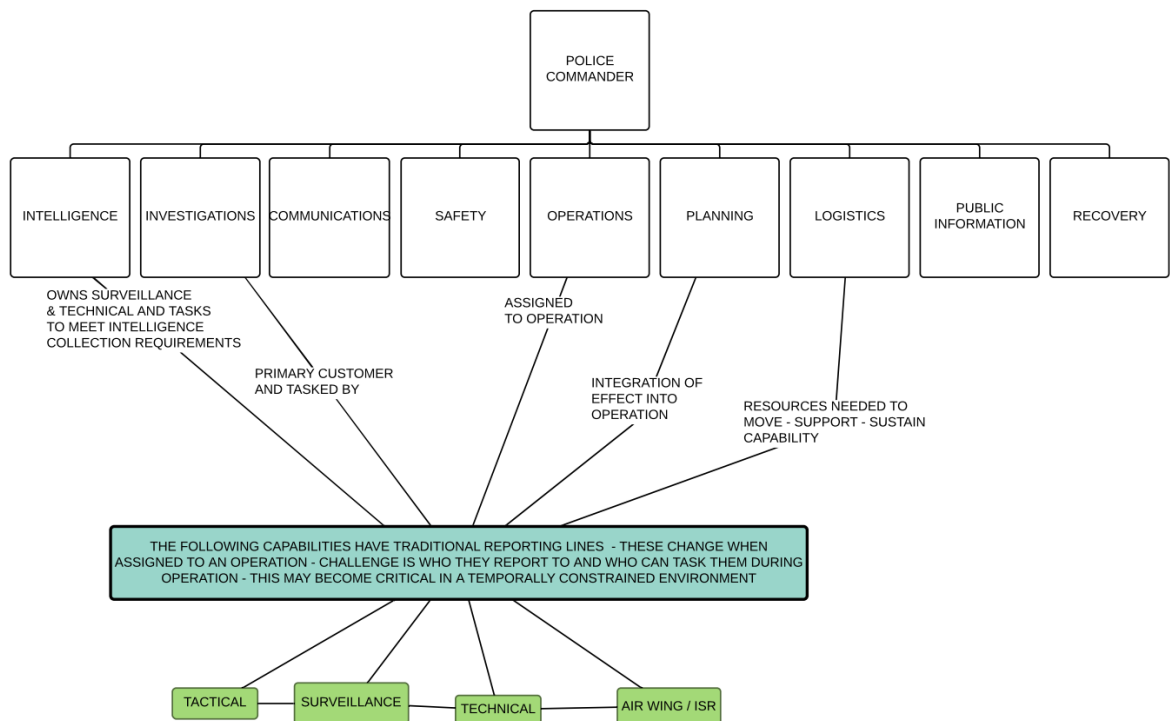
opportunity to gain the initiative. The originator of the OODA decision-making loop was Colonel John Boyd, a former fighter pilot with the U.S. Air Force. Boyd's approach (Observe, Orient, Decide and Act) was successfully applied in aerial combat; its core insight was that by driving rapid action it could inhibit the decision-making process of the adversary, simply by making decisions faster than the adversary could respond to. Similarly, the rigid nature of existing C2 systems renders a police commander vulnerable to an adversary who can operate faster than the formal C2 decision-making framework allows. The continued reliance upon bureaucratic structures that impose multi-layered information flows will see policing organisations relinquish their advantage to less well-equipped adversaries.

Decentralized, autonomous action (within limits, as practiced by Napoleon) is especially important in complex, rapidly-evolving circumstances, where a centralized authority would become overwhelmed by the myriad of detail necessary to understand the situation at each important point within the operational space – and military engagements are thus a classic example. Despite the lessons of history, similar problems with hierarchical C2 structures exist to this day. McChrystal, Collins, Silverman and Fussell (2015) identified such limitations during their analysis of contemporary military C2 systems, recognising that the only value of a rigid decision making process was to transfer responsibility to a more senior officer. This would render these decisions less effective, as the conditions changed by the time they could be implemented, something Napoleon clearly recognised.

Analysing the evolution of C2 systems used by the military shows that, in environments that are both complex and rapidly evolving, those organizations that were quick to adapt to the new environment were more likely to be successful than those who rigorously adhered to the methodology employed during a previous conflict. This provides an important insight to the persistence of hierarchical, rigid C2 systems that exist today: these systems are not wrong, they are simply optimized for simpler, familiar, routine applications. Compliance-oriented hierarchies are well-designed to execute efficiently known solutions to familiar problems. While every law enforcement situation is in some sense different from every event that has happened before, in most circumstances the differences are small and inconsequential, so the efficient application of an effective, known and practiced solution to a well-defined and familiar problem is an excellent response – and one that can be delivered by a traditional C2 structure. Most police work is routine, and profits from compliance-oriented application of known routine solutions.

By contrast, military engagements regularly present complex collections of novel challenges (again, because it is in the interest of the adversaries to confound and confuse) – so military C2 systems (the successful ones, anyway) have continued to evolve in the direction in which Napoleon pointed. This adaptation occurred throughout the duration of the conflict, resulting in C2 systems that were suited for that theatre of operations and era (Creveld, 1985). As technology continues to advance at an exponential rate *and* the threat evolves toward ever-greater levels of novelty, there is a clear need for C2 systems to also evolve in preparation for the next major challenge.

In contrast with their military counterparts, police agencies face a unique challenge because the community clearly expects that the C2 framework they use will get it right the first time it is activated in response to a crisis. This is largely because community (as well as media and political) expectations have been formed almost exclusively through repeated observation of *routine* events – for which this form of response is well-optimized and these expectations are reasonable and appropriate. Expecting first-time, every-time success in a *novel* engagement, by contrast, is akin to anticipating that a C2 framework can evolve during a single major battle or engagement whilst it is occurring. Clearly this is not feasible; even the ground breaking work undertaken by General Stanley McChrystal (ret) and subject of his best selling book *Team of Teams* was undertaken over an extended duration (McChrystal et al., 2015). To address this challenge within the relevant time frame, police organisations should adopt a proactive approach – they should invest in the personnel and resources necessary to develop an agile C2 framework and mandate training and participation in exercises for key commanders and their teams. If, instead, police organisations continue to rely upon a bureaucratic framework, their effectiveness in responding to future challenges will be degraded. These limitations are further exacerbated by the rigidly defined reporting lines of the ICCS Plus framework. This presents two distinct, but interconnected challenges. The first is that time sensitive information will not reach the police commander fast enough for she or he to make a decision. The second challenge is the potential conflict between various nodes endeavouring to assert ownership and tasking of key capabilities. These ownership and tasking lines change when a C2 structure is enacted. As an example, consider the following structure:



**Figure 4.0** ICCS Plus Reporting Lines – Specialist Resources

As illustrated in this diagram, multiple reporting lines have the potential to adversely impact the effectiveness of the police operation. This is because existing practices clearly define the tasking authorities and reporting lines for finite specialist capabilities, including covert surveillance and tactical assets during normal operations. These lines are not as well defined when a C2 structure is established and specialist capabilities may find themselves subject to competing tasking requests. The speed at which time sensitive information flows during a critical incident will significantly influence the outcome. In a temporally constrained environment the police commander may choose to exercise direct tasking authority over specialist resources and establish direct lines of communication to ensure situational awareness is retained during rapidly evolving incidents, where a lethal force solution is likely to be required to reduce an imminent risk to the community. While one possible solution is to have these reporting lines pre-determined prior to an incident, challenges will arise when the pace of the operation exceeds the ability of the structure to pass this information in the time required to enable decisions to be made and carried out. In addition, the situation may evolve, unexpectedly rendering such reporting lines ineffective. If dogmatic adherence to the mantra of the structure takes priority over the actual mission, then degraded performance is the likely result.

Another inherent challenge posed by the existing framework is that leaders of each node are often placed there due to rank or seniority in the organisation. Current practice sees the police commander regularly meeting with the leaders of these nodes separately from the rest of the C2 team. The net effect is that when the police commander is seeking advice or feedback prior to making a critical decision, some of the personnel who may be best able to provide input are not afforded the opportunity. It was this limitation that McChrystal addressed through what he termed ‘shared consciousness’, whereby regardless of rank or stature, every member of the team had access to information that was previously only the domain of those in the most senior positions (McChrystal et al., 2015, p. 216). McChrystal also created an environment where expertise was valued and regardless of rank or position members felt safe to voice opinions and views based on their subject matter expertise (SME) in particular areas. Edmondson and Harvey (2017) support this approach discussing the innovation and learning benefits resulting from the creation of an environment where psychological safety is valued.

The ICCS Plus framework could also be viewed as an attempt to pre-define the structure appropriate to the as-yet-to-be-determined future problem set. The selected police commander may then commence with the belief that this is the most suitable structure to address it. As technology continues to evolve and new threat vectors develop, this approach is likely to be rendered ineffective because the speed and complexity of the operating environment will overwhelm its static capabilities.<sup>3</sup>

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<sup>3</sup> Indeed, the adversaries are trying to design their actions precisely to exploit the weaknesses of the pre-specified, static command structure.

To transcend the limitations of the existing paradigm – and its increasingly frequent poor performance in the face of the evolving adaptive adversary – future police commanders should instead start with a clean slate and build a dynamic structure and team that is appropriate to the challenge. This will require a new approach to both training methodologies and policies. The Australian Army (2009) observed that the prevailing belief that operational success was commensurate with the level of prior planning undertaken is not in fact reflective of the environment. Future commanders should recognise they are in a “competitive learning environment” (Head Modernisation and Strategic Planning, 2009, p. 32) and they need to adjust their approach correspondingly. This approach means that they can no longer rely upon pre-existing plans but will need to create an environment that enables learning about the problem during a critical incident, whilst adapting at a rate exceeding that of their adversary.

### **Strategic Command – The Role of the Commissioner**

Police agencies have integrated terminology and concepts from business and the military. These terms are now in common usage in corporate documents and operational plans. This presents a significant risk as terminology is crucial in policing, particularly when the understanding of specific words used is likely to be subject to an external review. Perhaps the same rigour that is used to determine the meaning and intent of legislation could be applied to this imported terminology. Terms like “strategic” can have a variety of connotations dependent upon the environment in which they are utilised, creating a significant risk of misunderstanding. Such terms are also at risk of losing their impact due to over usage.

The levels of police command adopted by agencies in Australia find their precedent in military writings, particularly those relating to the levels of war. While there is significant divergence in thought on some aspects of these ideas, it is broadly agreed within business, military and policing that there are three distinct yet interconnected levels of command authority, commonly referred to as strategic, operational and tactical. The current interpretation relied upon by Australian police agencies can be found in the ANZPAA ICCS Plus framework. This view is perhaps reflective of some of the recent debate regarding levels of command, particularly those pertaining to the Commissioner and Deputy Commissioners, that occurred during the Coronial Inquest into the Lindt Café Siege in 2014 (State Coroner of New South Wales, 2017).

Current ANZPAA guidelines relegate the Commissioner and Deputy Commissioner(s) to the realm of policy. While this may be an interesting theoretical position, it is not reflective of the reality of command within policing, nor the established paradigm upon which these levels of command are based (Australia New Zealand Policing Advisory Agency, 2017, p. 9). It does, however, provide an opportunity to review this framework and clarify roles and responsibilities for future operations. This will also provide a clear benchmark against which oversight bodies can measure police response.

As previously defined, command inherently implies authority – and at no stage is this removed by legislation or relinquished by the Commissioner or Deputy Commissioners during an incident. At all times they retain the lawful authority to intercede and exercise command should they deem it appropriate or necessary. To the contrary, the first decision made at the strategic level resides with the Commissioner, for it is only she or he who may determine if an incident is an act of terrorism. The requirement for this determination to be made by the Commissioner, or in exigent circumstances by the Deputy Commissioner, is prescribed by legislation (New South Wales Government, 2017).

This determination resides at the strategic level and provides the nexus between National/State/Territory Government intent and the operational capability to achieve objectives. It is the Police Commissioner or the Deputy Commissioner who at the strategic level selects and empowers the police commander at the operational level. This is what occurred in Sydney on the 15<sup>th</sup> of December 2014, when the Commissioner of the New South Wales (NSW) Police selected the Police Commanders and Police Forward Commanders to deal with the Lindt Café Siege in Sydney. This decision by the NSW Police Commissioner was made pursuant to standing arrangements in place at the time. These were detailed in Task Force Pioneer, the NSW Police C2 framework to be activated in response to an act of terrorism (State Coroner of New South Wales, 2017).

The strategic decision to determine that the incident is terrorism also provides broad ranging powers to the police commander and their team. To safeguard the usage of these powers the decision-making authority resides at the most senior level. Such powers clearly reflect government intent and provide police with significant investigative and use of force authorities, beyond those already existing in legislation. Another significant authority that remains with the Commissioner of Police is the decision to recommend to the relevant Minister and Premier of a State (or Chief Minister of a Territory) Government that call out of the Australian Defence Force (ADF) is needed to resolve the incident. In broad terms this can only occur when the incident is of such a nature that it is beyond the capability and capacity of the police to resolve. This request for the ADF's Tactical Assault Group pursuant to Part IIIAAA of the Defence Act (Australian Government, 2016) is clearly a strategic command decision, as it involves the use of a national mission force to achieve government intent through the use of force.

During incidents of this nature the Police Commissioner or Deputy Commissioner is frequently collocated with the relevant minister(s) and head of government. This provides a strategic nexus between the political intent of the government and the apparatus to enable that intent to be translated into action. It also provides reassurance to the community when personalities they are familiar with from government and police address them via the media.

## **Towards a Dynamic, Adaptive C2 Framework**

What all of this suggests is that the current, traditional, static, hierarchical C2 model cannot effectively cope with the increasingly common novel, complex, and rapidly evolving true crisis situations that will confront future police commanders. What is needed is a more flexible structure – a framework to guide real-time design choices about the needed C2 elements to match the specific circumstances faced, and within which the team can construct its current working arrangements, revisiting and altering the design (swapping elements in and out and rearranging lines of authority) as needed as the situation – or the team’s understanding of it, or both – morph.

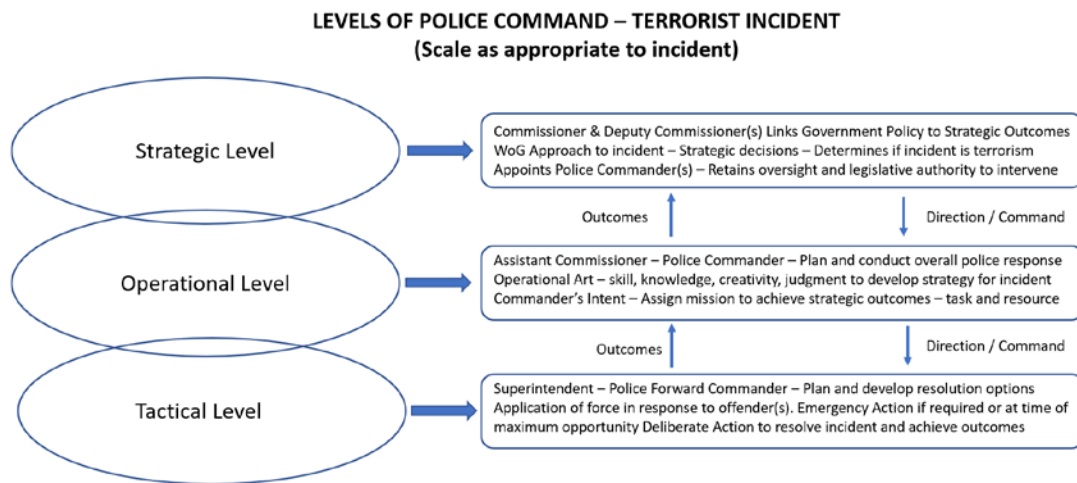
Before we outline the adaptive C2 framework we are suggesting, we first need to define the terminology we will be using. The following key terms are integral to C2 and to avoid any confusion they are clarified below:

Strategic Level of Command: Connects a political purpose or policy with the means to achieve it. This may include the lawful use of force to achieve a political objective (Gray, 2015). The allocation of State or National resources to realise political goals or objectives (Joint Chiefs of Staff, 2017; UK Ministry of Defence, 2014). The strategic commander is also looking ahead to consider the changes to the environment post resolution.

Operational Level of Command: This links the strategic and tactical levels and is responsible for the resourcing of the tactical level. The operational commander and their team utilise their skill, experience and judgment to devise an overarching plan to resolve the incident. They will then assign missions to tactical elements to execute (Joint Chiefs of Staff, 2017; UK Ministry of Defence, 2014). Officers at this level are required to possess a high level of strategic awareness.

Tactical Level of Command: This is where the planning for the actual engagement or use of force against an adversary to achieve an objective takes place and is carried out (Joint Chiefs of Staff, 2017; UK Ministry of Defence, 2014).

The relationships between these levels can be represented as follows:



**Figure 5.0** Levels of Command

Strategy: Strategy is referred to as the ‘Art of the General’ but in recent times the terms strategic and strategy have become diluted from over usage. Gray (2015) discusses the usage of the term to elicit a favourable response from the intended recipient or audience as a result of the level of confidence the term can instil. Strategy is a set of ideas about how best to coordinate State/National capabilities to achieve strategic objectives, including the lawful use of force (Joint Chiefs of Staff, 2017; UK Ministry of Defence, 2014). Strategy is the intentional application of selected means to achieve chosen ends.

Commander’s Intent: This provides the commander with the mechanism to explain her or his vision and enables the team to plan and deliver accordingly (Leakey, 2015). Commander’s intent is comprised of three sections:

- Purpose – why the operation is being undertaken. (This can also form part of the mission statement.)
- Approach – the broad approach to be used to address the problem set presented and accomplish the mission.
- End-state – the desired outcome (Department of the Army, 2014).

The commander’s intent provides for unity of effort towards achieving the mission and provides motivation by explaining why the task is to be undertaken. Commander’s intent is highly relevant to military applications because it empowers subordinate elements to continue with the mission when communications fail or are deliberately targeted by an adversary. In policing it provides an opportunity for the police commander to conceptualise the problem set they are faced with and concisely describe how they intend to approach it and what success may look like.

Critical Incident: “Any incident where the effectiveness of the police response is likely to have a significant impact on the confidence of the victim, their family and/or the community” (Metropolitan Police, 2016, p. 2).

Mission Statement: This is the who, what, when, where and why of an operation describing section tasks in a short sentence or paragraph (Department of Defense, 2018). While it may be derived in part from Commander’s Intent, it remains a standalone element.

Node: An element or capability within the C2 network. Examples may include; planning, operations, logistics, tactical, and so on. ICCS Plus (Australia New Zealand Policing Advisory Agency, 2017) refers to these as functions, but under the adaptive C2 model these are expanded to include specialist and additional capabilities as required.

Plan: Plans are developed and implemented at the operational and tactical levels to achieve strategic intent. They are aligned with and derived from an overarching strategy. This approach provides a single level of strategy from which missions and plans are derived.

Orders: Orders are derived from plans and provide for how they will actually be implemented.

Policy: Policy is formulated by government and details State/National intentions. Its effectiveness is dependent upon there being a credible strategy to realise it, a plan for making it happen, orders specifying the actions to be taken, and successful execution of the specified tasks. (UK Ministry of Defence, 2014).

## **Adaptive C2 – Understanding the Nature of the Challenge**

Albert Einstein famously stated that, “We cannot solve our problems with the same level of thinking that created them”. This quotation could perhaps describe the current police approach to C2. The very framework being utilised to respond to the most serious incidents or crisis is based on a methodology that is nearly 50 years old. Compounding the challenge are the embedded policies, culture and thinking that still view the world through last century’s filter. Arrayed against this are adversaries who readily and rapidly adapt, using emergent technologies for their benefit. Despite this threat, many policing organisations remain embedded in the prevailing bureaucratic culture. When faced with such complexity these organisations revert to the familiar and immediately seek to restore order by imposing structure and management principles, in the hope of a solution. This constrains the effectiveness of such organisations when operating in the contemporary environment (Uhl-Bien & Arena, 2017). Adopting an adaptive framework and agile mindset would enable these organisations to operate more successfully in uncertain environments that are rich in complexity (Setili, 2014).

As we approach the 50<sup>th</sup> anniversary of our current thinking in relation to static C2, it is an opportune time to consider what form future challenges may take and how we could design



the ideal police C2 system to address them. It is acknowledged that future crises will only increase exponentially in speed, complexity, impact and level of public scrutiny, therefore the key principle for a new C2 paradigm must be adaptability (NATO Science & Technology Organization, 2017). Police organisations need to adopt the traits of a complex adaptive system and be able to learn, adapt and morph within an fluid environment (Uhl-Bien & Arena, 2017). Such an approach will better enable police to optimise capabilities to address future threats to the community.

One of the first steps a police commander should consider at a critical incident is to frame the problem she or he is confronted with. Frames are mental models used to simplify complexity (Russo & Schoemaker, 2002). Developing the correct set of frames will assist commanders in understanding the inherent challenges contained within each problem type and how they can be approached. The following table outlines four generally agreed problem classifications, expanding and contextualising work done by the U.S. Army Training and Doctrine Command (2008, p. 9).

<b>Classification</b>	<b>Identification</b>	<b>C2 Required</b>	<b>Resolution</b>	<b>Review</b>
<b>Simple</b>	Problem can be recognised. Experience guides solution development. Problem can be addressed using existing operational structures.	Current traditional, static C2: Existing operational structures capable. Linear problem, clear start and finish points.	Can be resolved within existing agency capacity and capability.	Problem can be identified post incident and optimal solution also discernible.
<b>Complicated</b>	Requires an experienced team that can determine and agree on nature of the problem. It is comprised of components that when brought together create an environment, but do not alter each other (Uhl-Bien & Arena, 2017).	Enhanced C2: Existing nodes can be augmented by expert nodes as required. Linear problem, start state and end state can be determined.	Can be broken down into components, with solutions identified and implemented in a coordinated manner. Commander may need to select from multiple options.	Problem can be identified, but likely to result in a range of opinions on what was the most suitable resolution option. Subject to influence by hindsight bias.

<b>Complex</b>	An experienced team will be challenged to frame and define the problem. It will evolve over time and adapt in response to stimulus. Components mesh and alter each other in ways that are not anticipated and cannot be reversed (Uhl-Bien & Arena, 2017). This may result in a series of interconnected problems.	Adaptive C2: Required to address problem by enabling non-linear approach. Team diversity (gender-thought-experience) are critical enablers to foster creative / design thinking. Structure can morph as required.	Solution to problem not readily identifiable. Experienced multi agency team may not agree on problem classification or likely end state.	There will likely be conjecture over the classification of the problem and the most appropriate option for resolution. Subject to influence by hindsight bias.
<b>Wicked</b>	Chaotic problem that cannot be readily identified. Problem results from interconnected causal factors that cannot be readily separated and broken down.	Adaptive C2: Will not resolve a wicked problem may only reduce the impact of the problem i.e. tame it. Team diversity (gender-thought-experience) are critical enablers to foster creative / design thinking.	Solutions are contradictory and understanding of the problem is dependent upon viewpoint. There are no optimal solutions available.	Will be unable determine optimal resolution as it will be ongoing. Subject to miss classification and hindsight bias.

**Table 1.0** Problem Classification

Simple and complicated problems are more linear in nature and a science- and experience-based, or engineering approach will be applicable, whereby existing templates developed, tried out, and grounded in previous experience can be used. Complex and wicked problems by their nature are non-linear, without precedent and require a “design thinking” approach (United States Army Training and Doctrine Command, 2008). This requires an innovative team operating within a bounded ecosystem (Edmondson & Harvey, 2017) that is capable

of learning during the critical incident and developing options to resolve or tame the problem. Each problem will also contain a level of risk that will need to be considered by the police commander. This may not automatically correspond to the problem classification, as a simple problem could contain significant risk and will need to be considered on a case-by-case basis.

Problem classification can also provide some insight as what level of command is appropriate for the incident. Command decisions relating to simple and complicated problems can be made in accordance with existing authorities. At the operational level of command these are generally vested in the senior officer on duty at the police operations centre. They can formulate responses that align to pre-specified strategic goals when addressing critical incidents. Complex and wicked problems however, will require strategic decisions to be made in real time, thus necessitating the involvement of a strategic level of police command. The elevated level of risk involved will see the strategic level of police command interfacing with and providing advice to government, thus enabling the police commander at the operational level to focus more narrowly on the incident itself. The designated police commander must possess a high level of strategic awareness to successfully undertake this role. She or he will need the ability to evaluate the potential strategic impact of decisions in real time and how they align to the intentions of the respective governments.

Contemporary research into how the military and business approach future challenges has identified the importance of developing adaptive structures and networks. Setili (2014) posits that agility enables an organisation to identify and exploit opportunities fast enough to be effective. Coyle (2018) discusses how the formation of these new agile networks can create innovative solutions, due to new interactions or collisions between individuals or groups, not replicated in more rigid networks. This echoes work done by Johnson (2010) who identifies the benefits of liquid networks as fostering an environment where change can occur, as new networks form resulting in new approaches to the problem set. This is further supported by emerging recognition of the importance of social capital, described as the manner in which employees connect and interact with each other (M. Arena, Cross, Sims, & Uhl-Bien, 2017; M. J. Arena & Uhl-Bien, 2016). The U.S. Secretary for Defence, James Mattis (2018) recognises the importance of modernising existing practices and developing an agile workforce to prepare for the future operating environment. Mattis (2018) also recognises that legacy systems will be irrelevant in this environment and should not be relied upon.

This view is supported by Australian Federal Police (AFP) Commissioner Andrew Colvin who uses the term, 'dynamic' to capture the nature of the future operating environment and the organisational mindset the AFP will need to adopt to ensure it is correctly postured to meet it. The AFP recently published a strategy paper, seeking to consider what factors are likely to influence future threats and identify those capabilities that may be needed to address them. One of the key concepts recognised by the AFP is that multidisciplinary and multiagency teams will become standard, due to the complex nature of the environment

and the skills required to address future problem sets (Australian Federal Police, 2017). These teams will form organically, bringing together the skills needed to resolve complex investigations, before dissipating and reforming anew to meet future challenges.

A useful image in this context is a “sudden team” – a collection of individuals and/or agencies bringing different capabilities to the fight, where the membership is customized to fit (the current understanding of) the problem set. Because the problem may be different from what has been encountered before, the team cannot be prespecified, and this specific team may never have come together before (or even been contemplated before). Moreover, because the problem and the team’s understanding of it may be evolving, the team membership may need to be dynamic. Rashid, Edmondson, and Leonard (2013) refer to this challenge of dynamic team design as “Envision, Enrol, Engage.”

An example of this style of fluid approach to a problem was the community-based response to flooding in Houston, Texas in the aftermath of Hurricane Harvey in 2017. A community group of volunteers called The Cajun Navy came together, built a networked C2 capability using a readily available mobile application called Zello to turn mobile phones into portable radios. This amorphous network was enabled by real time mapping and a software enabled call and dispatch capability, all built by volunteers during the incident. It is highly unlikely that any government emergency service agency could replicate the design, delivery and implementation of such a system within similar timelines (Arsenault, 2017). This shows the capability and future potential of a liquid network style approach – and the challenges of incorporating the competencies necessary to develop and exploit it in real time.

The transition by military and business organisations towards a more adaptive framework and agile mindset to address challenges is widely evident. Police should consider a similar approach and create an adaptive C2 model capable of providing a capability that is endogenous to the incident. The importance of an agile C2 framework is also identified in recent work by NATO’s Science and Technology Organization. In a final report C2 agility was defined as, “...the capability of C2 to successfully effect, cope with, and/or exploit changes in circumstances” (NATO Science & Technology Organization, 2017, p. 20). The report also discusses the importance of aligning the approach to C2 with the nature of the problem set. This can be achieved by designing a solution to the problem set that considers which nodes will be required at each stage along the incident timeline (NATO Science & Technology Organization, 2017).

The future operating environment for police will become increasingly complex as we face challenges from human and artificial networks. The ability to shape public opinion and media through the use of cyber capabilities is only just starting to enter the public consciousness. It will require networks to address the threat posed by networks, and future police teams will need the skills and capabilities to rapidly form the right network at the right time to protect the community. Police organisations will transition beyond existing multi-agency and multi-jurisdictional capabilities to encompass multi-domain operations. In this context, cyberspace will become increasingly important and often pre-eminent.

One approach to visualising this new paradigm is to frame it within a bordered ecosystem. An adaptive C2 framework shares many of the principles of an ecosystem as discussed by Stone (2012) including:

- Networks: The C2 system is a bounded network that is created to respond to or resolve an incident or crisis. It is connected to a wider network within the organisation, external stakeholders and partner agencies. Key to the functioning of this network are relationships that enable the network to function as effectively as possible. These relationships should be established well in advance of the crisis, for which the network is formed in response – though the specific network to be used for any particular critical incident cannot be pre-specified (since the best design will be dependent on the unique problem set that arises from the event itself). What *can* be developed in advance is the set of relationships and the frameworks for how the sudden team will be devised and how its members will interact.
- Nested Systems: Multi level systems exist within the nodes of the C2 network and all are interdependent; each node is actually a system within the wider C2 network.
- Cycles: Interactions between nodes within the system and beyond its borders to exchange and provide resources as required, in support of the mission.
- Flows: Information and actionable intelligence are the lifeblood of the C2 ecosystem, flowing across all nodes as required.
- Development: As the use of this C2 approach matures and nodes continually interact, they will grow and develop, enhancing existing capability.
- Dynamic Balance: This refers to the continual feedback loops within the C2 system, which will enable it to adapt to changes in the environment. In the adaptive C2 paradigm this means that the system can transition during an incident or crisis to ensure capability is maximised at key points along the incident timeline.

In the midst of a crisis the temptation exists to rush to diagnose the problem and immediately commence implementation of a solution. Future police commanders will need to take a different approach, first considering the problem set to be faced, then identifying what is known at each point along the incident timeline as it unfolds and designing a dynamic C2 framework that is most appropriate at each stage. This does not limit the nodes that the police commander can interact with, rather it prioritises those they need direct lines of communication with, in order to gain situational awareness and to make decisions that can be carried out in time to have effect. This new approach to C2 also empowers the police commander to start shaping the environment in a way that is favourable to their objectives and not merely in response to actions undertaken by the adversary.

Police commanders require a C2 framework that can provide the following:

- Increased situational awareness.
- Ability to determine the most suitable C2 framework and adapt it as required.
- Transmission of time sensitive information to and from the commander.

- Clear reporting lines to reduce friction points and oversee and mobilize capabilities, with the ability to morph as appropriate.
- SME's who can provide understanding of specialist capabilities and limitations.

By arranging and displaying the C2 components at varying stages of the operation, the police commander also provides clarity to the remaining nodes about reporting lines at particular points along the incident timeline. This needs to be supported by a technology package that provides a common operating picture across all aspects of the C2 framework. This new C2 paradigm must have three distinct characteristics:

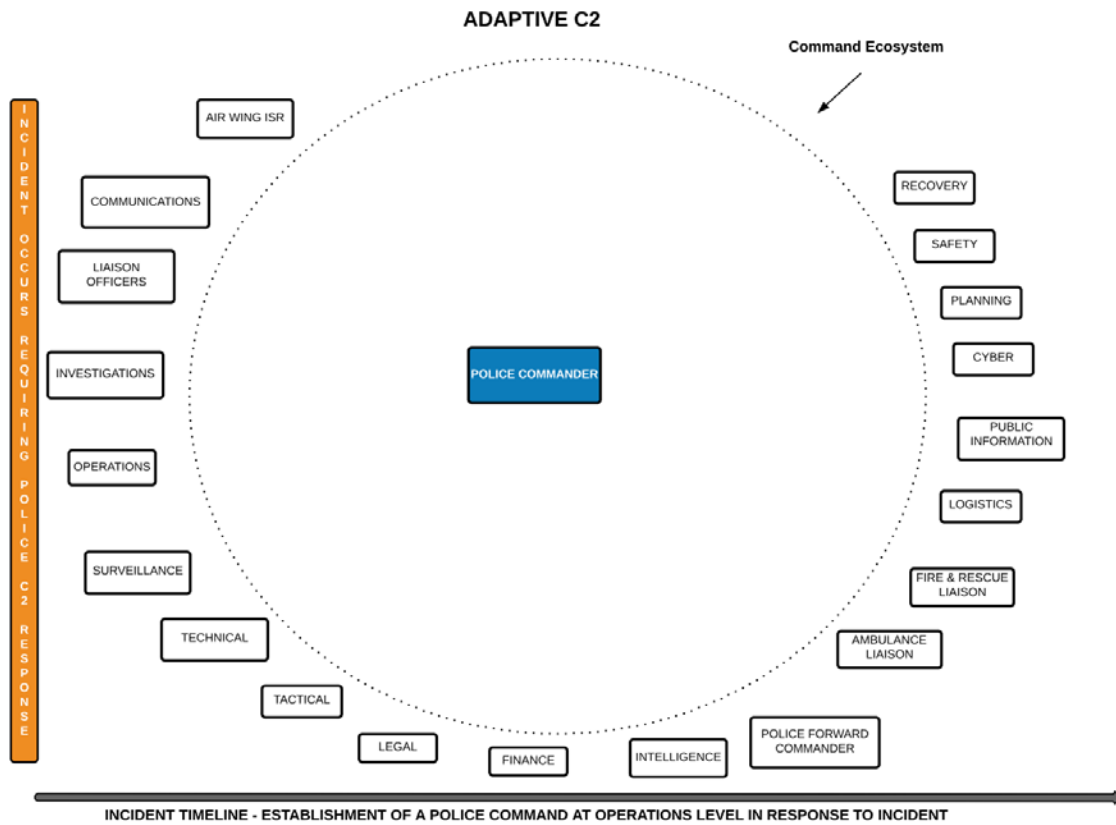
- Resilient – Able to withstand disruption
- Adaptive – Is not fixed for duration of incident, can morph as required
- Disciplined – Allows commander to step back and focus on situational awareness, orderly decision-formulation and resolution, and competent execution.

We might refer to these as the “infrastructure” on which the specific team will be built. In a different context, Valentine & Edmondson (2015) refer to this as “scaffolding” – flexible structures that will be made precise in the moment.

### **Adaptive C2: A New Paradigm**

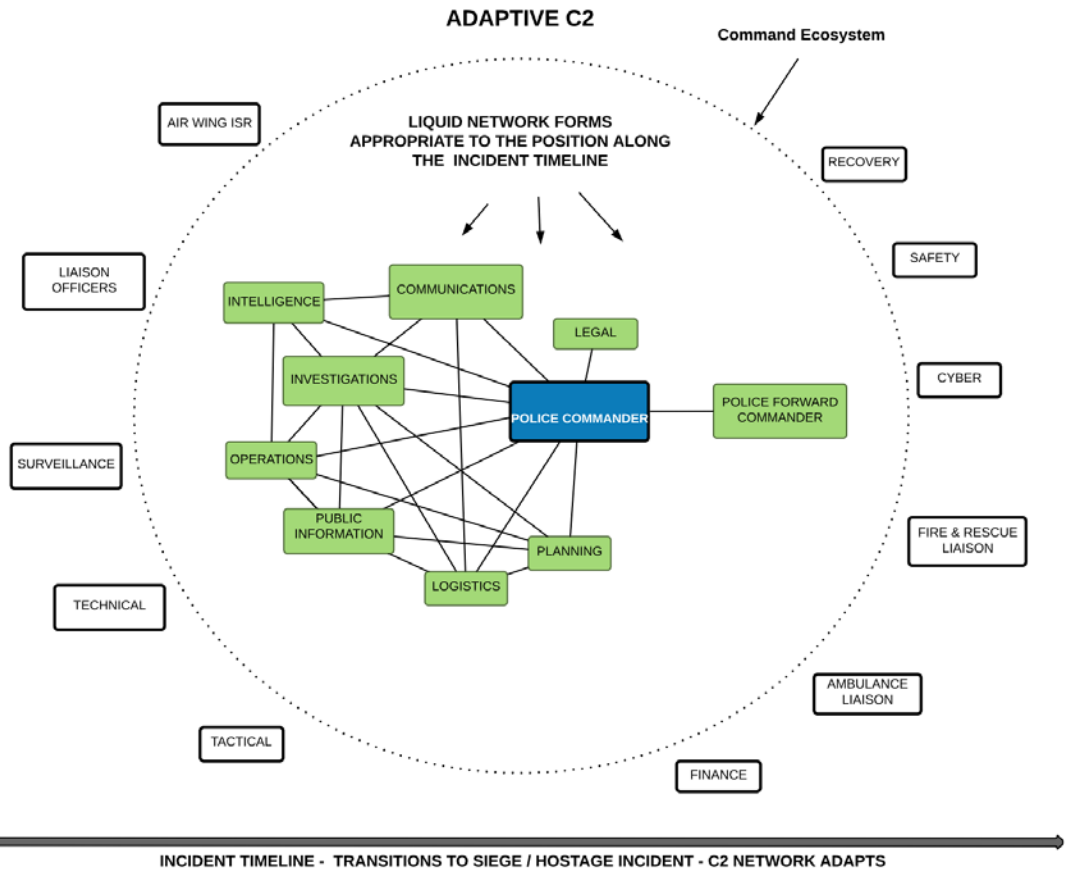
The new approach to C2 will provide the police commander with the opportunity to develop an initial working hypothesis and adjust accordingly as more is learned and as the critical incident evolves. This may necessitate changing some of the nodes initially selected as part of the network and continuing this process until the incident is resolved. A visual representation of this process is displayed in the illustrations that follow. They represent the evolution of a critical incident that involves a group of terrorists taking a number of civilians hostage. The diagrams illustrate how an adaptive C2 approach can morph as required along the timeline.

On the left of the timeline a critical incident has occurred necessitating a significant police response and the appointment of a police commander. The following diagrams are representative of the operations level of command and are not designed to be a template, but rather to generate and foster discussion about a different way for police to approach C2. Figure 6.0 shows the nodes available to the police commander who is establishing a C2 network in response to a terrorist incident occurring. The police commander is attempting to discern the problem set and select those nodes they believe will best provide initial situational awareness.



**Figure 6.0** Police Command Ecosystem

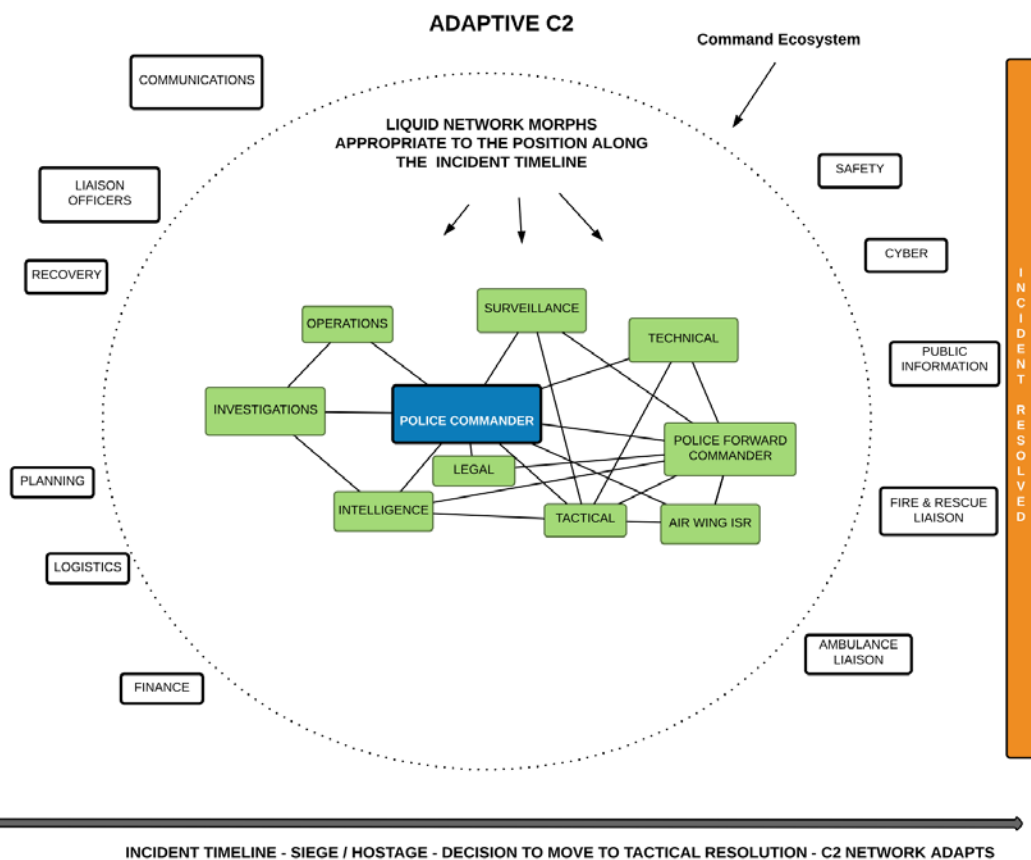
Once the police commander decides what the initial response will look like, he or she can then establish a C2 framework as seen in Figure 7.0. This is represented by the nodes entering the bounded ecosystem and coming together to form a network endogenous to the critical incident. This occurs as the timeline continues to progress and nodes can be added or removed as the situation necessitates; the structure thus provides flexibility and increased capability and speed. This ensures maximum effectiveness and minimises friction points because conduits for information and decision making are not restricted.



**Figure 7.0** Adaptive C2 Network Forms



As the critical incident progresses the police commander may determine that tactical resolution is now the preferred option to rescue the hostages and bring the event to a closure. This will require nodes linked to specialist capabilities to transition into the C2 ecosystem and those focused on longer-term issues to be removed, as the system morphs towards the currently-needed requisite capability. Speed of information flow becomes pivotal to mission success, informing the police commander of changing circumstances and opportunities, while enabling timely decisions that can be rapidly acted on. This enables tactical capabilities to pivot and execute on direction and/or approval from the police commander at the most opportune time.



**Figure 8.0** C2 Network adapts to enable Tactical Resolution

The preceding diagrams are focused at the operational level of command and will continue to adapt following the resolution phase, as the C2 framework focus shifts to recovery and investigation. Should additional threats be identified the system can adapt again to address these and re-posture itself accordingly. One of the key enablers underpinning this system is that it is dependent upon a trained team of individuals who possess a high level of trust when working with each other.

## **Approaches to Decision Making**

The famous maxim ‘chance favours the prepared mind’ is attributed to the 18<sup>th</sup> century French biologist Louis Pasteur. His work during the period later saw him recognised as the father of modern immunology. His philosophy on mental preparation is just as relevant today as when it was first espoused. Preparing the mind for the rigours and stressors of command requires an ongoing investment of time to study and learn from past operations and to identify and consider what form future threats may take and how they may be addressed. Working through challenging exercises without readily discernible solutions will help inoculate police commanders from some of the cognitive stressors they will experience. This can assist them to retain the capacity to operate at the peak of their cognitive ability during a critical incident.

Key insights can also be gleaned from the experiences of other commanders from a variety of disciplines, who can share what it was like to be in that moment when they were confronted with the gravest of threats. One such commander is Chief Joseph Pfeifer, head of Counterterrorism and Emergency Preparedness for the City of New York Fire Department (FDNY). On the morning of 9/11 he was the first Chief to arrive on scene at the twin towers. Since that fateful day Chief Pfeifer has worked tirelessly to better position the FDNY and City of New York for future threats. Chief Pfeifer is also a Senior Fellow at the Harvard Kennedy School and in this role, he bridges the gap between scholar and practitioner, writing and developing command concepts that will help prepare and guide others for the challenges they will face. Critical incident commanders will be subjected to a number of external forces during an incident. Chief Pfeifer (2013) classifies these as physical, psychological, political, social and operational. As part of their mental preparation the police commander and his or her team would be well served by reviewing Chief Pfeifer’s work. He succinctly outlines the manner in which these forces can interact during a critical incident, citing real world examples to better illustrate the scope of the challenge (Pfeifer, 2013).

These forces left unchecked can degrade cognitive abilities, including those required for decision making. The police commander will need to mentally track multiple variables during a critical incident. This can limit the availability of cognitive resources for decision making. One approach to mitigating this is to externalise memory by writing down key information. This releases those parts of the brain previously used to store this data to be used to conceptualise and evaluate solutions to the problem set at hand (Levitin, 2016).

The key role of the police commander is to make high consequence decisions. She or he will be required to make such decisions in temporally constrained environments, during times of high stress and great uncertainty. A simple google search for ‘decision making models’ returns in excess of 12 million results, indicative of the number of options available. The range of potential scenarios a police commander may face precludes the use of a single framework for decision making. Determining the type of problem set will serve as a guide to the style of decision making that will be most suitable. The police commander

and the team may then choose to utilise either one or a combination of the following three approaches to decision making:

Recognition Primed Model:

Gary Klein is an acknowledged expert in the field of naturalistic decision making, a field of study that examines how people make decisions in the real world. During his early research in the 1980s Klein (2017) studied firefighters and members of the military seeking to discern how they made decisions in compressed timeframes. The prevailing wisdom at the time held that a person faced with an important decision would develop several options, weigh each accordingly by comparing them to the others and then determine the most suitable choice and act upon it.

Klein (2007, 2017) found that this was not actually what people were doing. Instead, they relied upon the expertise they had built up during their careers to rapidly evaluate the problem set they were faced with. They then searched their cognitive repertoire for a similar scenario, matched the patterns, and selected the one closest to the current situation – and then activated the corresponding action / response “script.” Klein noticed that responders undertook an additional step: when an option was identified, it was mentally evaluated to see if it was feasible. If it was a close fit, it could be modified for purpose and then executed. If deemed unsuitable the next available option generated was evaluated and the process continued until a suitable option was identified and implemented. Klein (2007) illustrated this process in the following model.

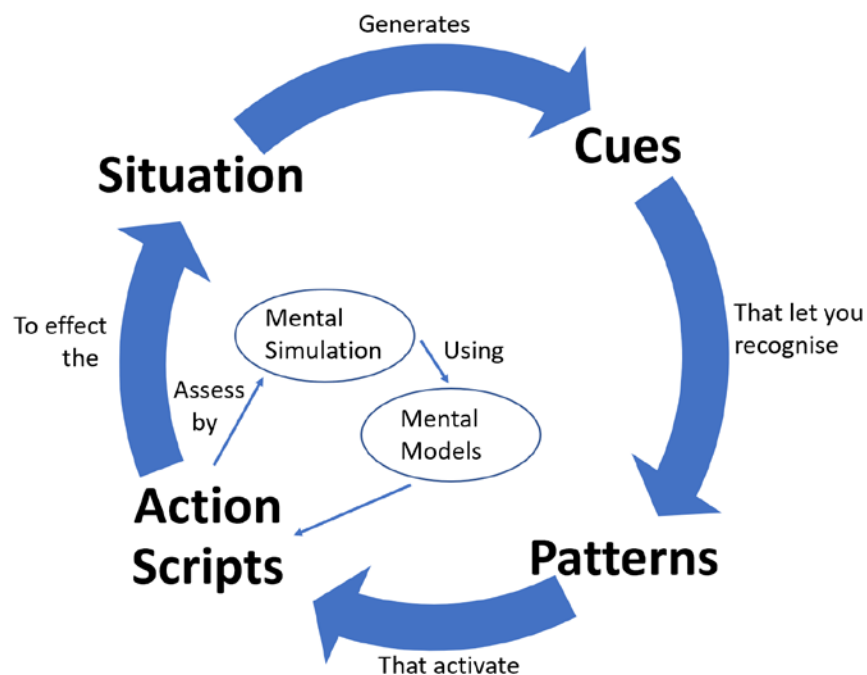


Figure 9.0 Recognition-Primed Decision Model (Adapted from Klein, 2007, Location No. 603)

Unlike in the rational choice model, the generated options were not generally compared with each other; instead, a singular evaluation approach was adopted, assessing each on its own merits. This model was not designed to identify the absolute best solution – rather, its purpose was to quickly identify the first *workable* solution. This approach suited simple and complicated problem sets due to their linear nature. It is most likely to be applied within the traditional C2 framework due to the time constraints involved. Its success is dependent both upon the nature of the problem faced – that is, its degree of linearity – and upon the level of expertise of the decision maker. Professional development and practice through challenging exercises will help to increase the level of this expertise. This approach can be used at any level of command when C2 is fully established, should a critical decision need to be made within a compressed timeframe.

#### Rational Choice Model:

The second approach to decision making is perhaps the most widely known. Variants are taught by the public sector, military, universities and industry. At the core of this model are several key steps that are undertaken in sequence. The following scheme is a typical example:

- 0- Establish goals, priorities, and values and define mission and initial objectives<sup>4</sup>
- 1- Gain Situational Awareness (SA)
- 2 - Generate a series of options to achieve mission
- 3 - Compare and evaluate each option's predicted outcomes against the others
- 4 - Decide which option to use / record decisions and rationale for each
- 5 - Execute the selected option
- 6 - Review how the selected option worked / learn and adapt / review SA

This approach would suit the full range of problem sets, but its potential impact will be limited when addressing or minimising complex and wicked problems, unless it is combined with a team based model. It is highly applicable to police operations because one of its inherent benefits is that it can be used to justify why a decision was made, or particular course of action taken (Klein, 2017). It provides a framework that enables the C2 element to record what was known about the critical incident at the point in time when the police commander made her or his decision. Recording the rationale for why an option was chosen when compared with others, as well as why each other option was not selected can provide evidence to any subsequent inquiry or review, demonstrating that alternatives to the action undertaken by police were considered. Such a record may alleviate some of the inherent hindsight bias present in such an inquiry (Fischhoff, 1975).

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<sup>4</sup> We number the establishment of objectives as “0” because we regard it as logically prior to all other actions and decisions – none of the others can proceed without first defining goals and priorities.

Klein (2017) also recognises the benefits of this model when endeavoring to identify the optimal course of action to undertake, particularly when the problem set is of a complex nature. This model is based on the premise that comparing a range of developed options will result in the best possible decision. The limitation of this approach is that it dependent upon the diversity, experience and skill sets of the commander and the C2 element that developed the options to choose from. A lack of cognitive diversity within the C2 element will likely constrain the range of options generated, resulting in the execution of a less optimal choice.

#### Team Based Model:

The future is likely to contain increased challenges in the form of complex or wicked problem sets, rendering the traditional linear problem solving approach less effective. Linear problem sets include those with a quantifiable start state and an understanding of the desired end state. Addressing problems where the start and end states are unable to be clearly defined requires a non-linear approach. This team based paradigm is reflective of the increasing complexity police commanders will face in the future. Dealing with complex and wicked problems will require the synthesis of expertise across multiple domains (Edmondson & Harvey, 2017). This will result in the formation of a team whose capabilities are aligned to the problem set. Pivotal to addressing these future challenges will be a team based culture that values and fosters innovation and cognitive diversity (Edmondson & Harvey, 2017; Page, 2017).

A key enabler for teams to be successful is culture; it is the essence of what binds them together, establishing both strong bonds and the standards to be upheld. The importance of culture is well understood by elite sporting teams like the New Zealand All Blacks rugby team, regarded as one of the most successful sporting franchises of all time. They see culture as, "...an identify, an ethos, a belief system – and a collective passion and purpose" (Kerr, 2013, p. vii). In such a culture the team itself becomes an intelligent entity rather than a collection of individuals (Klein, 2017). The capabilities of such cognitively diverse teams far exceed the skills of any single member no matter how talented. Page (2017) identifies the benefits of such teams due to the range of options they are able to generate, when faced with complex problem sets.

Diversity can include those who appear, act or think differently from the prevailing norms of the group. Cognitive diversity refers to the "differences in how we interpret, reason and solve." (Page, 2017, p. 2). Page (2017) further posits that the most important factor in diversity is how we think, acknowledging that experiences resulting from identity diversity will contribute towards this. Cognitive diversity will significantly enhance the level of agility and innovation available to a C2 team during a critical incident. Achieving this may prove a challenge for policing organisations with a historical pattern of recruiting people of similar gender, experience and worldview. Such organisations may fall victim to groupthink, or the traditional echo chamber, resulting in a reduced capacity for innovation.

One approach to mitigating this is to see cognitive diversity as a strength and build this capability to help meet future challenges.

The benefits of diversity can be realised, "...when people with diverse cognitive repertoires work inclusively on complex tasks" (Page, 2017, p. 2). Each member brings a range of mental tools, based upon their experiences, skills and field of expertise. When faced with complex tasks that require the synthesis of this expertise, a team is more likely to be successful if it is cognitively diverse. If every person on the team brings the same mental tools then the overall expertise of the team has not increased. Instead if each person brings with them a range of mental tools appropriate to the problem set and at least some of them are not also held by other members, then the expertise of the team as a whole increases (Page, 2017).

Police agencies have made significant advances in recent time by recruiting for diversity, most notably in addressing the gender imbalance. Acknowledging the significant time it takes to reach such senior positions organically, the transition to a more cognitively diverse workforce at the most senior levels is likely to be a generational one. Consideration could also be given to investing in the depth of talent already occupying these positions, by taking Assistant Commissioners off line for a year and allowing them to attend a specialist course of study focused on their role. Such an approach would mirror the Army War College model for senior officers in the U.S. The role of the Army War College is to develop these officers to be skilled in the art of critical thinking and solving complex problems. Senior police face challenges akin to those of their military and private sector colleagues yet are rarely afforded the same opportunities for such career focused development. Adopting such a model could increase the level of cognitive diversity in the short to medium term, whilst better preparing these senior officers for strategic roles they will occupy in the future.

## **Conclusion**

The future is uncertain and will present challenges not yet imagined. What is certain is the need to start investing intellectual capital into how best to position and prepare for what is to come. The future requires an adaptive C2 capability, capable of operating at speed and providing situational awareness in support of critical decisions. Fixed mindsets and models rooted in historical precedent are unlikely to be able to cope with future demands. Multiagency, multijurisdictional and multidomain operations will continue to become the new standard and this will necessitate agreement on key C2 terminology and frameworks to maximise capabilities.

Preparing for the unknown also provides an opportunity to review how exercises are planned and conducted. It is acknowledged that some exercises should continue to use the current paradigm of practicing a C2 response to a critical incident by familiarising participants with their roles and responsibilities during such an event. This approach could be complemented by a new style of exercise that focuses on the cognitive challenges likely to be faced by the police commander and their team. Exercises that involve complex and

wicked problems should be undertaken to intellectually challenge and stretch participants. Such activities would facilitate innovation during times of stress and uncertainty, as the commander and her or his team seek to frame and work through a critical incident as it continues to evolve. To successfully achieve this will require a team capable of designing and delivering such activities and participants willing to engage in them.

Further work in this C2 space may include multi-layered models, encompassing strategic, operational and tactical levels simultaneously across an incident or crisis timeline. Conceptual work could expand to include the use of 3D versions of such models in real time, enabling identification of friction points or constraints effecting communication pathways. This will enhance situational awareness across the environment and identify opportunities to intercede and bring about resolution. While a great deal of work in designing adaptive C2 systems, developing the skills needed to operate in such environments, and practicing these skills through exercises remains to be undertaken, the path forward to a stronger, more resilient, more flexible approach lies open before us.

## REFERENCES

- Arena, M., Cross, R., Sims, J., & Uhl-Bien, M. (2017). How to Catalyze Innovation in Your Organization. *MIT Sloan Management Review*(Summer), 39-47.
- Arena, M. J., & Uhl-Bien, m. (2016). Complexity Leadership Theory: Shifting from Human Capital to Social Capital. *People + Strategy*, 39(2), 22-27.
- Arsenault, A. (2017). Crowdsourced command centre co-ordinates rescue efforts in Houston. Retrieved from <http://www.cbc.ca/news/world/harvey-houston-rescue-cajun-navy-1.4268007>
- Australia New Zealand Policing Advisory Agency. (2017). *A Common Approach to Incident Management: ICCS PLUS*. Melbourne: Australian New Zealand Policing Advisory Agency Retrieved from <http://www.anzpaa.org.au/about/general-publications/a-common-approach-to-incident-management-iccs-plus-iccs-plus>.
- Australian Federal Police. (2017). *Policing For A Safer Australia: Strategy For Future Capability*. Canberra Australian Federal Police Retrieved from <https://www.afp.gov.au/sites/default/files/PDF/strategy-for-future-capability.pdf>.
- Australian Government. (2016). *Defence Act 1903*. Canberra: Australian Government Retrieved from <https://www.legislation.gov.au/Details/C2016C00955>.
- Coyle, D. (2018). *The Culture Code: The Secrets of Highly Successful Groups*. New York: Bantam Books.
- Creveld, M. V. (1985). *Command In War*. Cambridge, Massachusetts: Harvard University Press.
- Department of Defense. (2018). *DOD Dictionary of Military and Associated Terms*. Washington DC: U.S. Department of Defense Retrieved from <http://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/dictionary.pdf>.
- Department of the Army. (2014). *FM 6-0 COMMANDER AND STAFF ORGANIZATION AND OPERATIONS*. Washington DC: Department of the Army Retrieved from [http://www.milsci.ucsb.edu/sites/secure.lsit.ucsb.edu.mili.d7/files/sitefiles/fm6\\_0.pdf](http://www.milsci.ucsb.edu/sites/secure.lsit.ucsb.edu.mili.d7/files/sitefiles/fm6_0.pdf).
- Edmondson, A. C., & Harvey, J.-F. (2017). *Extreme Teaming: Lessons in Complex Cross-Sector Leadership*. Bingley UK: Emerald Publishing Limited.
- Federal Emergency Management Agency. (2017). *National Incident Management System*. Washington DC: Department of Homeland Security Retrieved from [https://www.fema.gov/media-library-data/1508151197225-ced8c60378c3936adb92c1a3ee6f6564/FINAL\\_NIMS\\_2017.pdf](https://www.fema.gov/media-library-data/1508151197225-ced8c60378c3936adb92c1a3ee6f6564/FINAL_NIMS_2017.pdf).
- Ferguson, E. (2017). AIIMS-4 2017: Implications for Incident Management Teams. Retrieved from <https://www.afac.com.au/insight/operations/article/current/aiims-4-2017-implications-for-incident-management-teams>



- Fischhoff, B. (1975). *Hindsight / Foresight: The Effect of Outcome Knowledge on Judgment Under Uncertainty*. Springfield VA: National Technical Information Service.
- Gray, C. S. (2015). *The Future Of Strategy*. Cambridge UK: Polity Press.
- Head Modernisation and Strategic Planning. (2009). *Adaptive Campaigning - Army's Future Land Operating Concept*. Canberra: Australian Army Retrieved from [https://www.army.gov.au/sites/g/files/net1846/f/acfloc\\_2012\\_main.pdf](https://www.army.gov.au/sites/g/files/net1846/f/acfloc_2012_main.pdf).
- Howitt, A. M., & Leonard, H. B. (Eds.). (2009). *Managing Crises Responding to Large-Scale Emergencies*. Washington DC: CQ Press.
- Johnson, S. (2010). *Where Good Ideas Come From: The Natural History of Innovation*. New York: Riverhead Books.
- Joint Chiefs of Staff. (2017). *Joint Publication 1: Doctrine for the Armed Forces of the United States*. Washington DC: U.S. Department of Defense Retrieved from <https://fas.org/irp/doddir/dod/jp1.pdf>.
- Joint Chiefs of Staff. (2018). Joint Doctrine Publications. Retrieved from <http://www.jcs.mil/Doctrine/Joint-Doctrine-Pubs/>
- Kerr, J. (2013). *Legacy: What The All Blacks Can Teach Us About The Business Of Life*. London: Constable.
- Klein, G. (2007). *The Power of Intuition: How to Use Your Gut Feelings to Make Better Decisions at Work* (Kindle ed.). New York: Doubleday.
- Klein, G. (2017). *Sources of Power: How People Make Decisions 20th Anniversary Edition* (Kindle ed.). Cambridge MA: MIT Press.
- Leakey, B. C. (2015). Disciplined Initiative and the Commander's Intent. *Small Wars*, (May). Retrieved from <http://smallwarsjournal.com/printpdf/23537>
- Levitin, D. J. (2016). *The Organised Mind: Thinking Straight in the Age of Information Overload* (Kindle ed.). New York: Dutton.
- Mattis, J. (2018). *Summary of the 2018 National Defense Strategy of The United States of America: Sharpening The American Military's Competitive Edge*. Washington DC: U.S. Department of Defense Retrieved from <https://www.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf>.
- McChrystal, S., Collins, T., Silverman, D., & Fussell, C. (2015). *Team of Teams: New Rules of Engagement for a Complex World*. New York: Penguin Publishing Group.
- Metropolitan Police. (2016). *Critical Incidents Policy Statement and Equality Impact Assessment*. London: Metropolitan Police Retrieved from <https://www.met.police.uk/globalassets/foi-media/policies/met-hq---portfolio--planning---critical-incidents-policy--equality-impact-assessment>.
- NATO Science & Technology Organization. (2017). *C2 Agility: Task Group SAS-085 Final Report*. Brussels: North Atlantic Treaty Organisation Retrieved from [http://www.dodccrp.org/sas-085/sas-085\\_report\\_final.pdf](http://www.dodccrp.org/sas-085/sas-085_report_final.pdf).

- New South Wales Government. (2017). *Terrorism (Police Powers) Act 2002 No 115*. Sydney: NSW Government Retrieved from <https://legislation.nsw.gov.au/#/view/act/2002/115>.
- Page, S. E. (2017). *The Diversity Bonus: How Great Teams Pay Off in the Knowledge Economy*. Princeton: Princeton University Press.
- Pfeifer, J. W. (2013). Crisis Leadership: The Art of Adapting to Extreme Events. *Program on Crisis Leadership Discussion Paper Series*. Retrieved from <https://www.hks.harvard.edu/content/download/67377/1242318/version/1/file/Pfeifer+Crisis+Leadership--March+20+2013.pdf>
- Rashid, F., Edmondson, A. C., & Leonard, H. B. (2013). Leadership Lessons from the Chilean Mine Rescue. *Harvard Business Review*(July-August).
- Russo, J. E., & Schoemaker, P. J. H. (2002). *Winning Decisions: Getting It Right The First Time*. New York: Doubleday.
- Setili, A. (2014). *The Agility Advantage: How to Identify and Act on Opportunities in a Fast-Changing World*. San Francisco: Jossey-Bass.
- State Coroner of New South Wales. (2017). *Inquest into the deaths arising from the Lindt Cafe siege: Findings and recommendations*. Sydney: Coroners Court of New South Wales Retrieved from <http://www.lindtinquest.justice.nsw.gov.au/Pages/Findings.aspx>.
- Stone, M. K. (2012). Applying Ecological Principals. Retrieved from <https://www.ecoliteracy.org/article/applying-ecological-principles>
- Uhl-Bien, M., & Arena, M. (2017). Complexity leadership: Enabling people and organisations for adaptability. *Organizational Dynamics*, 46(1), 9-20.
- UK Ministry of Defence. (2014). *Joint Doctrine Publication 0-01*. Swindon: UK Ministry of Defence Retrieved from [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/389755/20141208-JDP\\_0\\_01\\_Ed\\_5\\_UK\\_Defence\\_Doctrine.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/389755/20141208-JDP_0_01_Ed_5_UK_Defence_Doctrine.pdf).
- United States Army Training and Doctrine Command. (2008). *The U.S. Army Commander's Appreciation and Campaign Design*. Virginia: United States Army Retrieved from <http://adminpubs.tradoc.army.mil/pamphlets/TP525-5-500.pdf>.
- Valentine, M., & Edmonson, A. C. (2015). Team Scaffolds: How Mesolevel Structures Enable Role-based Coordination in Temporary Groups. *Organizational Science*, 26(2).