New Zealand
DEFENCE
FORCE
Te Ope Kātua O Aotearoa

# FUTURE LAND OPERATING CONCEPT 2035

## INTEGRATED LAND MISSIONS

New Zealand Government

A FORCE FOR
NEW ZEALAND

# AUTHORISATION

New Zealand's future land force operating concepts are developed and maintained by Army General Staff, New Zealand Defence Force (NZDF). Comments on factual accuracy or proposals for amendment should be directed to the Head of Strategy Management (Army) at:

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Deputy Chief of Army

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**EDITION: 2**

# **FOREWORD**
# FROM CHIEF OF ARMY

As the Chief of Army, I place great importance on the need to evolve our Army to match the challenges we will face in the future. The following pages present a concept for New Zealand land operations out to 2035. While the Future Land Operations Concept 2035 (FLOC 35) is fundamentally a forward-looking document, it also deliberately draws on historical lessons to highlight some of the continuities and discontinuities that will need to be managed if the NZ Army is to succeed in an uncertain and complex future.

A scan of the horizon sees an operating environment marked by shifting regional power balances, an increase in hybrid threats, rapid population growth, and the rise of climate change. This will require land and special operations forces that can work effectively in a wide range of environments and with many actors.

Key among my development priorities are the following:

- We must improve our ability to leverage and protect information within all forms of operational manoeuvre. Our adversaries are already doing this in 2017 and to be successful we will need to be proficient at leveraging information in all our activities.
- Partnerships are increasingly important. This means we must constantly challenge and improve the way we train and how we are structured. We must embed a culture that allows us to integrate and leverage our efforts with, through and on behalf of others. Notwithstanding, mastery of combined-arms skills (the ability of the Army to work together) remains the baseline requirement that allows us to contribute effectively to our air, maritime, coalition and public partners.
- People remain our 'vital ground', we must support them and their families; train them and lead them well and we must employ them gainfully. For their part, our people must commit to the ethics and values of the NZ Army and through their actions build its *mana*. In the future, there will be a growing tension between the need for specialists and our ability to field an adaptable generalist force. Striking this balance will require careful thought by commanders and staff alike. What will remain unchanged is that our warfighting success will continue to be founded on the professionalism and courage of young New Zealanders who are committed to the service of others.
- We will consolidate our operational and training units where possible to achieve economies of scale and to improve family stability. This priority will be delivered under the Land Training and Infrastructure Vision (Plan *Mere*).

History repeatedly shows that prosperity is underpinned by security and that land forces are fundamental to New Zealand's security and the promotion of its interests. The FLOC 35 provides a clear direction for our land and special operations forces to remain ready and relevant into the future. It is worth noting that the soldiers who will be serving in the NZ Army in 2035 are being born today. The decisions we make and the way we shape our future force will directly impact their survival and success. I expect all in the NZ Army, regardless of rank or role, to test and debate the concepts outlined in this document.

*Ka Rite*

(Be ready)

**P. T. A. E. KELLY, MNZM**
**Major General**

**Chief of Army**

# PREFACE

## PURPOSE

FLOC 35 is the NZ Army's capstone operating concept into the near future. It provides guidance for the development of concepts, experimentation, planning, force design and capability modernisation. The FLOC 35 sets out to précis the likely future operating environment and conceptualises how the NZ Army can succeed in 2035. The FLOC then describes the key capabilities required to build New Zealand's future land and special operations forces.

FLOC 35 is an aspirational document, aiming to provide a series of goals and overarching direction for the development of capability and strategy around which the NZ Army can generate and sustain the future force.

### The key functions of the FLOC 35 include:

- Providing the conceptual basis to generate, sustain and employ land and special operations forces. As such, it will inform an Army General Staff led Force Design Review in 2017.
- Informing and influencing the land force requirements of the Capability Management Plan.
- Guiding how the NZ Army achieves Defence White Paper and NZDF Future Joint Operating Concept (FJOC) 35 objectives.

### The secondary functions of the FLOC 35 include:

- Communicating, at a conceptual level, how the land force anticipates operating out to 2035 with Navy, Air Force, and NZDF force elements.
- Acting as a resource for all-of-government counterparts.
- Informing future Defence Assessments and Defence White Papers.

# FLOC 35 AS PART OF THE CAPABILITY MANAGEMENT FRAMEWORK

The NZDF conducts an iterative five-year strategy and policy review cycle, in accordance with the Capability Management Framework (Figure 1). The four main stages of this cycle are as follows:

**Stage 1:** ***Conduct a Defence Assessment or produce a Defence White Paper.***

**Stage 2:** ***Conduct an Environmental Scan.***

**Stage 3:** ***Produce a FJOC/FLOC.***

**Stage 4:** ***Conduct a Capability Gap Analysis.***

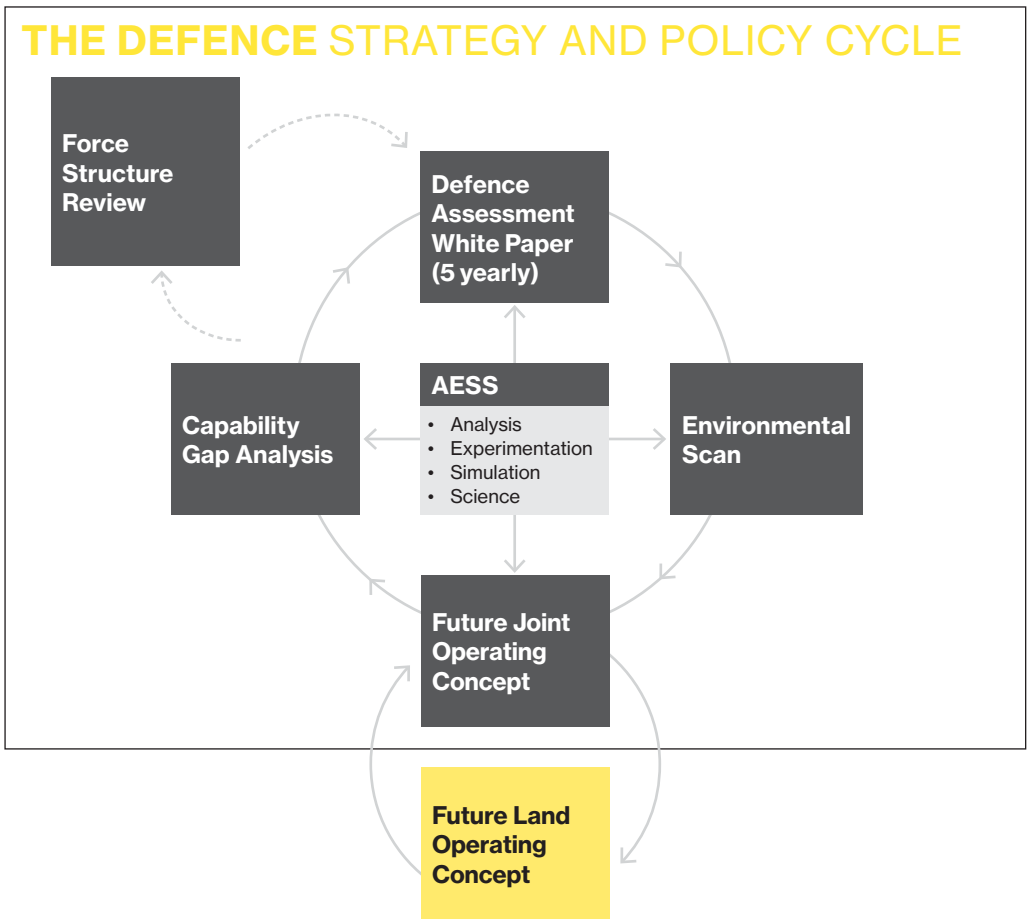



**Figure 1:** *The Capability Management Strategy and Policy Review cycle.*

# METHOD

The FLOC has been generated through analysis and assessment by Army General Staff. Horizon scanning[1] has been used in conjunction with wide-ranging literature reviews, interviews, input from subject matter experts and a broad scan of American, British, Canadian and Australian Armies future environmental and capability statements. Primary references are identified at the end of this document.

FLOC 35 supports the Defence White Paper 2016, Future 35, the Defence Assessment 2014, the FJOC 35, the Joint Task Force document, and the NZDF Capability Management Plan. Many of the statements listed within FLOC 35 stem from nested statements, conclusions, or ideas from these key pieces of work.

# TIMEFRAME

Selecting 2035 as the conceptual horizon enables macro themes to be examined and extrapolated beyond those normally considered within planning timeframes. The 2035 horizon is also consistent with existing NZDF concepts, including the FJOC 35 and the Defence Capability Management Plan.

1 Horizon scanning is the systematic forecasting of the future using present trends in the environment and society, combined with an emphasis on new and novel technologies.

# CONTENTS

# EXECUTIVE SUMMARY

## THE FUTURE LAND OPERATING ENVIRONMENT CHAPTER 1

Based on current and future global trends and the likely nature of land warfare out to 2035, it is assessed that the NZ Army's future land operating environment will be characterised by the following trends:

**Increasingly:**

- connected and monitored
- crowded
- partnered
- lethal
- complex

**Enduring need for:**

- combat-capable forces
- combined-arms excellence
- expeditionary forces that have strategic agility based on multi-role skills and the ability to quickly task organise
- superior situational awareness and decision-making

## THE FUTURE LAND OPERATING CONCEPT CHAPTER 2

Building on the previous chapter's macro themes, the future land operating concept reviews New Zealand's geo-strategic context and guidance from the Future Joint Operating Concept to define four characteristics required in the future land force:

- **a light fighting force** – able to conduct close combat and effectively employ combined-arms capabilities and tactics
- **agile** – able to task organise and integrate with partners for expeditionary operations
- **precise** – a digitised force, with leaders empowered to take initiative (mission command) and who aspire to excellence
- **force multipliers** – act with legitimacy, and are innovative, interoperable, apply leverage, and organisational synergies between multi-role (conventional) and special operations forces.

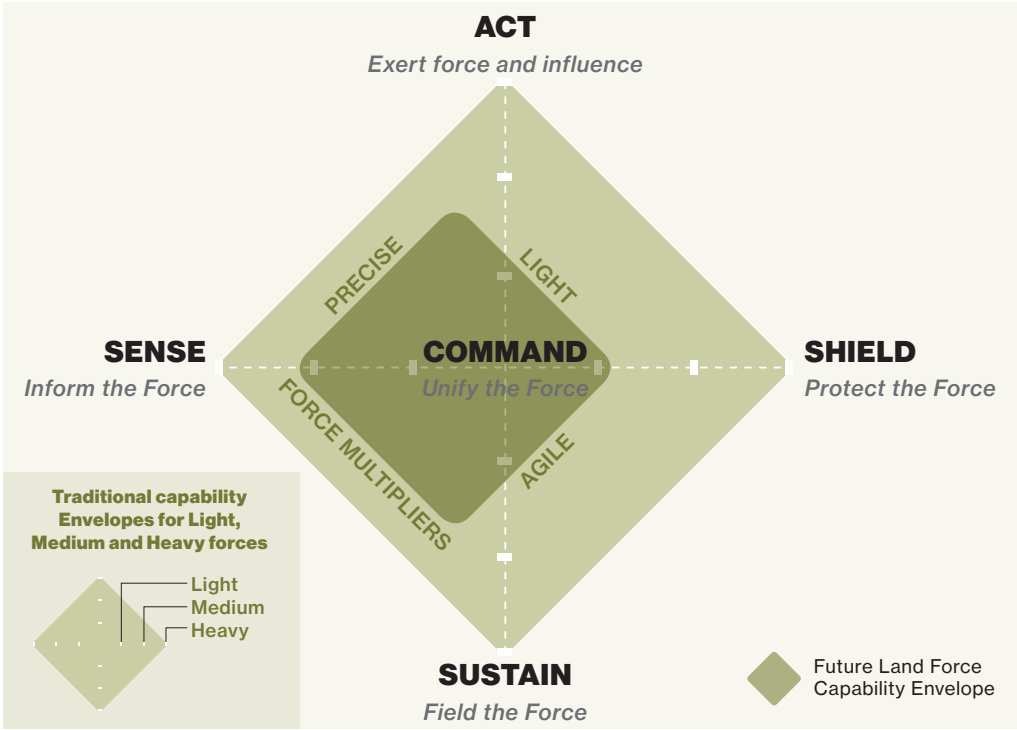



**Figure 2:** *The Future Land Force Capability Themes*

By international standards, the NZ Army will remain a small army with limited firepower and levels of force protection compared to medium or heavy forces in other nations. To succeed in the future operating environment, the NZ Army will require a qualitative edge based on highly trained and motivated soldiers who are ethical, physically tough and well equipped. Cutting-edge investment in situational awareness and command and control tools will give NZ Army elements the agility to remain a relevant combat force on the future battlefield.

The NZ Army will actively seek to maximise its qualitative edge through 'force multiplier' strategies. Key among these is the preservation of legitimacy, improving the synergies between special and conventional operations and enhancing interoperability so the NZ Army can multiply its effect through partnerships.

## THE INTEGRATED LAND MISSIONS CHAPTER 3

Integrated Land Missions are a conceptual framework that describes how the NZ Army contributes to NZDF operations in support of Government policy. Integrated land missions are:

- Information Activities
- Joint Land Combat
- Capacity Building
- Population Support
- Population Protection

## FUTURE LAND CAPABILITIES AND THE CHIEF OF ARMY'S DEVELOPMENT INTENT CHAPTERS 4 AND 5

The future land capabilities required to achieve integrated land missions are discussed in the context of the American, British, Canadian, Australian and New Zealand (ABCANZ) Armies five capability themes in Figure 2 – Command, Sense, Act, Shield and Sustain. The Chief of Army's development intent then provides key development milestones.

## CONCLUSION

Future land capabilities envisioned in FLOC 35 will allow the NZ Army to meet the challenges of the future land operating environment and contribute to acceptable enduring conditions (see Chapter 2) through the conduct of Integrated Land Missions.

CHAPTER ONE

# THE FUTURE LAND OPERATING ENVIRONMENT

# INTRODUCTION

The world in 2035 will be vastly different in appearance and in character to that of today, given the current velocity of change. Notwithstanding, the world will retain structural and systemic similarities to the contemporary geopolitical, economic and social environments. Identifying how the trends shaping the future land environment will impact on the character of future land warfare is crucial to understanding how the NZ Army will need to be postured to meet the challenges of 2035. This chapter examines the future land environment from thematic and geo-strategic perspectives.

# MACRO THEMES IN THE LAND ENVIRONMENT

*New Zealand's economic priorities may shift, but national security and prosperity will remain underpinned by international stability and access to global markets through sea-lanes, air lanes and information and data networks.*

## Economics

Existing trends will continue and in places accelerate – the global economy will continue to integrate and specialise, and will become increasingly enabled by and dependent on technology. Energy resource use will evolve, with OECD demand decreasing in favour of new and increasingly sustainable power sources. Economic growth in Asia and Latin America will provide increased trade and economic opportunities for New Zealand. New Zealand's economic priorities may shift, but national security and prosperity will remain underpinned by international stability and access to global markets through sea-lanes, air lanes and information and data networks. The NZDF's FJOC assessed that the economy of the United States is likely to show greater resilience out to 2035 than many expect, and that the velocity of China's economic growth will moderate as the country seeks to manage internal and underlying systemic pressures. The Eurozone economies will rebalance and redefine themselves with regional and global consequences. If states outside the Eurozone continue to experience increasing economic growth, defence modernisation and arms races are possible in regional contexts, including within Asia.

Globalisation will inevitably continue, driven by multi-national corporations, technological advances and increasing opportunities for travel and virtual interaction. However, there is likely to be an undertow of nationalism and reversion to protectionist policies. These competing forces and a growing global wealth distribution challenge between the 'haves' and the 'have nots' will result in variable and shifting short-term economic trends, and may spur instability and conflict.

## Demographics

Decreasing birth rates in the developed world coupled with higher birth rates in the developing and undeveloped

world are likely to continue. This will drive current economic trends towards even greater divergence in wealth and instability. Prosperous states will continue to enjoy high standards of living, but will also confront the costs of aging and sedentary populations. Meanwhile, the developing and undeveloped world will face social and economic pressures, amplified by increasing populations and strained governance, that compound the difficulties of 'catching up' to the developed states.

In developed countries, contracting and aging populations will have an increasing impact on economic, social and political systems. Supporting retired generations with fewer working-age people will have a notable effect on the less-technologically enabled economies and nations. Changing demographics, including physical suitability, will mean the military will need to diversify its workforce to remain competitive at attracting the required talent.

Greater competition for working-aged populations will drive demand for immigration and automation. By 2050 some analysts suggest global migration will double to 405 million. This so-called 'diaspora phenomenon' has potential to excite creativity and productivity. However, without careful integration, diversity can also be divisive. It is likely that the future force will be called to intervene in internal conflicts where deep seated fears of changes in the status quo are fuelling intolerance and conflict. Given global connectivity, there will also be increasing potential for these fears to be fanned externally and for migrant voting blocs to be leveraged by homelands to influence host-lands' domestic politics. Recent examples include the Russian Federation's use of ethnic Russians in the Ukraine and the Crimea. These opportunities and pressures will alter the political calculus for homelands, host-lands and when necessary, intervention forces.

While the trends towards greater disparity between the developed and the developing world will continue, it is unlikely that the worst-case scenario of a dystopian future completely divided by wealth and poverty will eventuate.

Developed countries will continue to invest heavily in support, emergency and development aid, and with technological developments to stabilise and mitigate disparate economic growth. As they do so, a key development area will be the empowerment of women and girls. International studies show repeatedly that conflict has a disproportionate impact on women and girls and yet also, women's literacy and their involvement in peace building processes are strongly linked to reductions in armed conflict.[2]

## Technology

Technological development will continue, with many sectors continuing to see developments at exponentially faster rates. The British Army's 'Land Environment 2035' study identified 11 areas of technological innovation and growth that were assessed as providing the greatest potential impact on the future land operating environment:

- **Big Data.** Large data is having an exponential impact on societies.

2 As a means of promoting peace and human security, New Zealand is committed to the principles of the United Nations Security Council Resolution 1325, Women, Peace and Security.

This is enabled by the growth of the Internet and the increasing quantity and reach of data-enabled devices. The primary challenges facing the effective employment of big data are known as the 'Four V's' – Volume, Velocity, Variety and Veracity.

- **Machine Autonomy and Artificial Intelligence.** Many modern vehicles and electronic devices currently feature basic automation features. Full automation is rapidly being realised in a range of areas, including self-driving vehicles. Artificial intelligence is progressing from narrow (task-specific) intelligence towards eventual general intelligence, comparable to human brainpower and thought.
- **Human Enhancement and Augmentation.** The use of pharmaceutical, prosthetic and biological devices is already advanced within medical sciences and will likely become increasingly mainstream by 2035.
- **Advanced Material and Manufacturing.** 'Smart materials' and methods of manufacture are continuously being developed, with a range of industrial uses and commercial applications.
- **Synthetic Biology.** Manipulation of genetics has existed for centuries through agriculture and selective breeding, but is now being revolutionised through the increasing knowledge of genetics and the development of tools and techniques through which DNA and cells can be engineered.
- **Nano-systems.** Engineering and manufacturing at the nanoscale is becoming increasingly viable, opening possibilities for radical advances in miniaturisation.
- **Quantum Technology.** Exploiting knowledge and manipulation of sub-atomic particles offers new levels of performance in computing, sustaining Moore's Law (which states, roughly, that computing power doubles every two years).
- **Communications.** The exponential growth of digital communications is giving way to the 'Internet of Things', where vast arrays of items communicate through shared networks.
- **Remote and Autonomous Systems / Drones.** Robotics are increasingly available, sophisticated and cost-effective. There will be an

exponential increase in both the capabilities and prevalence of drones out to 2035.

- **Social and Behavioural Sciences.** Increased understanding of social and behavioural science allows additional insights and influences into intentions, behaviours and reactions of individuals and groups.
- **Directed Energy and Novel Weapons.** Using waves and energy to create lethal and less lethal weapon systems is becoming increasingly viable, including the development of laser weapon systems.

## Environment

Environmental change will continue. Climatic conditions will become less stable, sea levels are likely to rise and weather events will become more extreme. The United Nations assess that, ultimately, climate change will result in the reduction of available fresh water, increasing crop failures, and rapid changes in local eco-systems that will impact on agriculture and subsistence living societies. Large-scale salinisation of currently productive land and loss of top soil will contribute to migratory pressures which, combined with the loss of habitable terrain, could result in increased competition for resources and an increase in environmental emergencies and refugees. In the South West Pacific, the long-term viability of some island nations is likely to be under threat because of environmental changes.

## Geopolitics

The rules-based international order will endure, but only if it is equal to the pressures that work to destabilise it. If the value of adhering to legal rulings and agreements loses legitimacy, there is a risk that the rules-based order will be supplanted. Alternate futures include a reversion to 'populist' politics, anarchic regional and global competition, or a switch in polarity of global influence from the West to the East.

The most likely future out to 2035 is that, the United States will remain the pre-eminent global force in an increasingly multi-polar world and the United Nations will remain the pre-eminent organisation for regulation and intervention. However, the status quo will come under increasing challenge.

In the absence of sufficient reform, the United Nations will lose some of its influence to emergent and interest-based political, economic and military blocs. Competitors and adversaries will seek to develop relative hard power advantages over America (and, by extension, the West) through asymmetric tactics and strategies. American soft power and the post-World War II order will be questioned increasingly. The competing interests of extant and aspiring powers, international organisations and empowered individuals will make it harder for the international system to be governed in the manner it has been since World War II.

## Urbanisation

With the world's population expected to reach eight billion by 2030, the concentration of people in urban areas will increase. This will be amplified in the developing world, where 95% of the world's population growth is expected

to occur.[3] 'Shanty-towns' (improvised housing) will become an increasing feature in the developing world, with the poorest cities likely to see shanty towns dominating up to 70% of the urban area.

By 2030 there will be 41 mega cities (cities over 10 million), many of which will be in the Indian and Pacific regions. Urban growth is also likely to be concentrated in coastal and littoral areas that are vulnerable to rising sea-levels, flooding and storm surges. By 2035, the number of people inhabiting low-lying coastal zones will increase by 150 million people in Asia alone.[4] This has implications for where and when future land forces will be called upon to respond.

## Ideas and Identity

A more interconnected world may increase – rather than decrease – the differences over ideas and identities.[5] Algorithms increasingly dictate what information individuals consume, which creates 'echo chambers' that can harden people's ideas and promote populist politics and intolerance.

The interconnected world allows individuals to be transnational in their ideas and identities, in some cases ahead of loyalty to their homeland. The combination of individual and technological empowerment means that society is becoming increasingly informal and that in 2035 individuals will be comfortable exercising the choices that globalisation and the rise of technology offers them. The sense of empowerment will mean that people will increasingly want to make an individual difference and will be self-assured enough to believe they can do so.

These factors will impact on who the NZ Army selects and how it trains, retains and leverages its future force. The soldiers who serve New Zealand in 2035 are being born today. By the time they volunteer for service they will be self-assured, networked and purpose-driven. They will be more urbanised, educated, multi-cultural and, as a cohort, they will be initially less physically and mentally resilient than their predecessors.

## Shock Events

The above description is trends-based, and does not factor in the possibility of shock (low probability, high impact) or 'Black Swan' (atypical, unforeseen) events. While it can be difficult to anticipate such events, they are nonetheless likely to occur and will require flexibility and adaptability to overcome. Potential shock events include:

- Cumulative effects of climate change that undermine the eco-system's sustainability.
- Sudden geo-political shifts due to catastrophic natural disasters, global pandemics or super-viruses, including bioterrorism and engineered pathogens.
- Disruption to the world order because of miscalculation, internal fracturing of major states or power blocs or war amongst regional or global powers.
- Systemic collapse because of global banking failure or communication

3 Australian Army. (2014). Future Land Warfare Report. Directorate of Future Land Warfare, Australian Army Headquarters, Canberra: Australia.

4 National Intelligence Council (2017). Global Trends Paradox of Progress. US National Intelligence Council, (Washington:America, p 10.

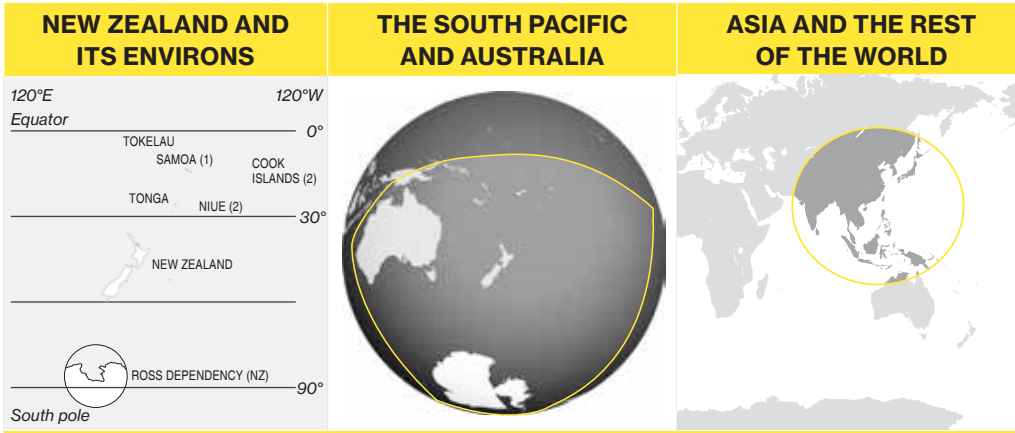
5 Ibid, p 17.

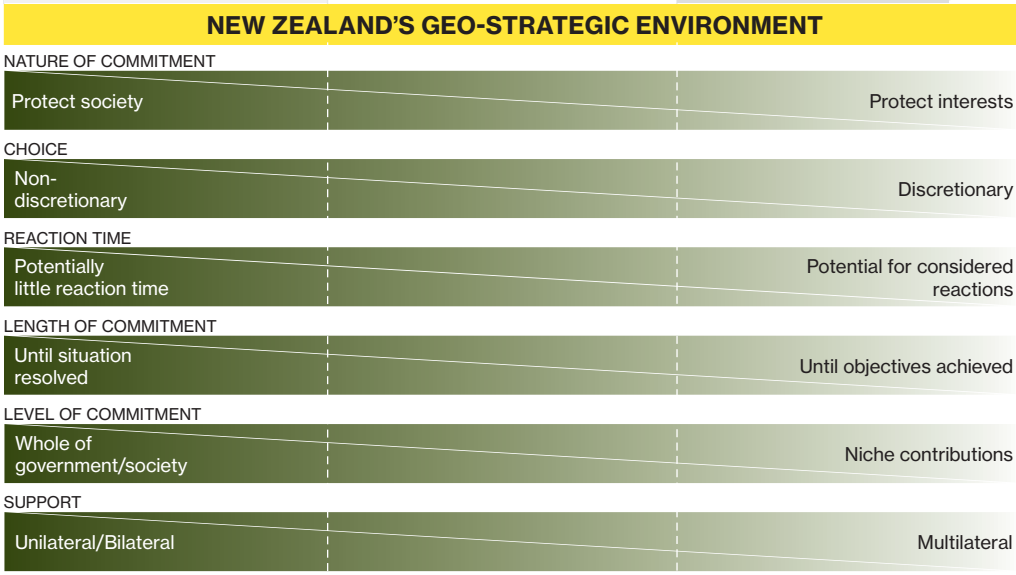
outages, from natural or engineered causes.

The ability of the NZ Army to adapt to such events will be enhanced through regional and global awareness and engagement, as well as through agility and resourcefulness inculcated through training, education and attitudes.

# NEW ZEALAND'S GEO-STRATEGIC CONTEXT

Geography has an enduring influence on political and military strategies. Figure 3 highlights the key freedoms and constraints that military and political decision makers will face in the future as they seek to match New Zealand's resources (means) to the task of improving its security and prosperity (ends) at local, regional and global levels.




***Notes:*** *(1) Friendship Treaty; (2) Self-governing in free association with New Zealand.*

**Figure 3:** *New Zealand's Geostrategic Environment*[6]

6 New Zealand Defence Force (2012). *NZDDP-3.12 New Zealand Special Operations Doctrine* (2nd Ed). Wellington; NZ, p 27.

## New Zealand and its Environs

The greatest risks to New Zealand and New Zealand's dependencies out to 2035 will continue to be border control and illegal resource exploitation (including illegal fishing), natural and human disasters. With New Zealand being on the Pacific rim of fire, the environmental challenges that result and contribute to these risks are substantial.

New Zealand's area of responsibility is also substantial. New Zealand's Exclusive Economic Zone and continental shelf cover an area greater than Europe, and at 30 million square kilometres New Zealand's search and rescue region is one of the world's largest and covers 8% of the globe.

There will continue to be a strong imperative for the NZDF to be able to respond to and assist New Zealanders, New Zealand communities and those Pacific Islands that operate as dependencies or in free association with New Zealand when required to do so in an emergency. While primacy for domestic constabulary operations rests with government agencies other than the NZDF, the Defence Act 1990 enables the NZDF to assist them, including with armed assistance in time of emergency.

## Australia and the South Pacific

Within the 2035 timeframe, the greatest risks to Australia and the South Pacific are likely to be to human security due to natural disasters, climate change, unstable civil governance or illegal resource exploitation that undermines the economic viability of Pacific States. Terrorism will continue to be a highly localised, small-scale but high profile threat in the region.

The regions bordering New Zealand are typified by vast continental and oceanic distances. The South Pacific is punctuated by dispersed island chains with limited air and seaports. Consequently, these points of entry are strategically significant. If they are not useable, amphibious operations may be essential for the projection of land forces into a theatre.

New Zealand and Australia will continue to have mutual alliance responsibilities in the event either is threatened. Security events in the South Pacific may require an independent New Zealand response, however in most cases the response is likely to be a regional effort with very close involvement by Australia and Pacific Island nations.

## Asia and the Rest of the World

As a small and isolated trading nation with one of the most globalised economies in the world, New Zealand relies on a rules-based international order to sustain its security and prosperity. Consequently, New Zealand was one of the original signatories to the United Nations Charter and works hard to maintain multilateral relationships that are trust and principles based.

Most of New Zealand's military commitments have been in response to threats against the prevailing international system or against human security. In the future, these two types of threat will become even more intertwined. If human security

cannot be sufficiently guaranteed, then mass migration, intra-state conflict and wars will result, destabilising and undermining the international order. Consequently, it is in the global context that New Zealand's greatest opportunities and greatest risks lie. For this reason the future land force, like its predecessors, must be regionally astute and involved as well as fundamentally prepared for global activities that span the spectrum of peace and war as part of New Zealand's obligation to and reliance on collective security.

# THE IMPACT – LAND WARFARE IN 2035

## Enduring Nature of War and Conflict

The underlying feature of the international system is inter-state competition through all components of national power (diplomatic, informational, military and economic). Competition (and, by extension, armed conflict and war) will remain a recurring phenomenon for the same reasons Thucydides identified circa 400 BCE – fear, honour and interest.

Further, armed conflict and war will remain an inherently political act. The classical trinity of primordial violence, the play of chance, and war's subordination to policy and reason will endure. War and warfare will continue to be a contest of will, and therefore, any military undertaking will inevitably be subject to and impacted by friction, danger and uncertainty.

## Changing Character of Armed Conflict

The character of armed conflict is constantly evolving as are its impacts on – and impacts from – changes in the land and human environments.

## Increasingly crowded

Future land operations will typically occur among the people. In part this reflects adversaries desire to control the people and the importance Western forces place on protecting the populace and defending the resources and legitimate social structures that support their survival and prosperity.

Consequently, future land operations, ranging from humanitarian intervention to combat, are likely to be concentrated and in or around cities and the hinterlands and coastal zones that sustain them.

## Increasingly Lethal

Technology will continue to shape the conduct of war. Every major technological advance has brought with it improvements to weaponry, sensors and systems that can, in turn, be harnessed by evolutions in tactics and training with the overall outcome of increasing lethality. In recent history, the rate of change has accelerated. Previously step changes in warfare took centuries to occur. Current step change is far more rapid, with capabilities a decade old now subject to battlefield obsolescence. Digitisation has been a key accelerant. For instance, digital communications allow a contemporary land force to completely out-class forces from even a decade ago and 'jointery' gives individual soldiers access to greater levels of lethality than previously seen in entire formations.

This trend will continue through to 2035. Advances in networks, sensors and decision-making tools will continue to improve the situational awareness, response time and agility of land forces. Weapons will become more effective, precise and autonomous, and active-seeking munitions will become widespread and increasingly economical. Such capabilities will not be limited to traditional militaries – non-state actors are also increasingly technologically enabled and in some cases they are leading innovation.

## Increasingly Dispersed

As weapon-systems have become increasingly lethal, military forces and soldiers have adapted by operating with increasing levels of dispersion. Tactical dispersion is highly reliant on modern communications technology, and the individual and collective professionalism of modern forces.Operationally, land forces have shrunk in size while their lethality has increased. Modern armies, especially those from developed countries, rely increasingly on technology, information superiority and mobility to synchronise operations and to compensate for reduced numbers of deployed personnel.

Irregular or unconventional forces will also be able to take advantage of the increasing sophistication and prevalence of civilian information networks to co-ordinate their own regional and global manoeuvre. As a result, the distributed application of force will be a developing theme in the coming decades.

## Increasingly connected and monitored

Any individual can capture, record, alter and share observations and material. Singular actions and events can be captured and promulgated, impacting global audiences in a very short space of time. This poses challenges and opportunities for land forces. In all future land operations, operational security and surprise will be harder to achieve and it will be easier for information to be misinterpreted, taken out of context or deliberately doctored. At the same time, there will be comparable opportunities for the NZ Army to leverage information activities to influence target audiences.

## Increasingly Autonomous

The increasing economic viability and technical capabilities of remote and autonomous systems (robotics) will see them playing a far greater role in every aspect of commerce and daily life, as well as on the battlefield.

At one level, remote and autonomous sensors and weapons will improve force protection. The destruction or loss of a machine does not have the same impact or consequences as the loss, injury or death of a soldier. Such systems can also be more effective than a human, with greater endurance (such as being able to monitor an objective without relief or rotation) and can be designed to have far greater levels of concealment. Improvements in artificial intelligence will allow for more effective automated systems and, in time, for more effective weapons delivery platforms and targeting.

Conversely, by 2035 Western forces will be increasingly exposed to observation and attack from remote and autonomous systems as they become readily available to militaries, civilians and irregular forces alike. Large quantities or 'swarms' of small and disposable remote or autonomous air systems, for example, may be used to harass and attack friendly forces, even if the enemy does not possess a conventional air force and has not gained control of the air in the traditional sense. Irregular adversaries will compete with conventional military forces in new and novel ways by using improvisation to weaponise commercially available systems. This will mean that Western land forces used to operating with minimal concern for air attack or artillery interdiction, will now need to reconsider the extent and types of threat they will be facing out to 2035.

Robotics are the key to future air warfare and to a lesser extent maritime warfare. However, land operations will remain fundamentally soldier-centred, even as remote and autonomous systems are increasingly integrated into them. Soldier-centred forces will be essential to retaining the confidence and support of democratic societies at home and there will be an enduring requirement for human soldiers to connect and partner with the societies they are sent to support or protect.

# WARFARE IN EASTERN UKRAINE TRENDS IN FUTURE WARFARE

In 2014 a separatist movement in Eastern Ukraine centred around the Donbas region declared independence from the Ukrainian government. As the crisis developed, the intensity of conflict escalated until, by the end of the year, Ukrainian forces were engaged in high-intensity combat and warfighting operations against the Russian and rebel forces.

From July 2014, the contested Bonbas region was dominated by remote and autonomous aerial systems fielded by the rebels. At least 13 fixed-wing drones and one type of quad-copter were used by the Russian-backed forces, with drone operations seeing multiple types operating at different altitudes and in different areas. These systems almost certainly contributed to a high level of situational awareness within the separatist command structure, and enabled the rebels to use their artillery to notable and lethal effect. In particular, a medium-ranged drone was linked to Multiple Launch Rocket Systems (MLRS), and could deliver fire-missions within 15 minutes of the drone identifying a target.

This was particularly devastating when Ukrainian army forces were trying to isolate Donbas from supply routes through to the Russian border in August. At Zelenopillya two Ukrainian mechanised battalions were caught in the open and, in a fire strike that lasted only fifteen minutes, a combination of artillery and MLRS destroyed a large number of combat vehicles and caused devastating numbers of casualties in the battalions. The losses the Ukrainian Army suffered in a six-week period of artillery attacks culminated in a decisive loss at the Battle of Ilovaisk, when half a dozen combined-arms Russian / rebel battalions conducted an aggressive combined-arms advance, using artillery and drones to isolate the battlefield, suppress the Ukrainian defenders and assault their positions with heavy armour and mechanised infantry.

The ability for the rebels, supported by Russian forces, to deliver such overwhelming firepower in a short space of time indicates the vulnerability a land force has to conventional military capabilities (combined-arms tactics and artillery) supported by modern technology (remote aerial systems), especially in the absence of comparative situational awareness and counter drone capabilities.

Source: Karper, P (Dr), *"Lessons Learned" from the Russo-Ukrainian War*, 8 July 2015, The Potomac Foundation, John Hopkins Applied Physics Laboratory and US Army Capabilities Centre; America.

## Increasingly Complex

*...the future land force must be confident at dealing with complexity. Land forces must be able to operate on intent based orders and nuance their responses to match threats and opportunities that might not have been foreseen in doctrine.*

The security environment is a complex-adaptive system. It is diverse, highly connected and the actors are interdependent and adaptive. As complex systems get bigger and more interconnected, the relationship between risk and scale is exponential. Consequently, small actions can trigger shock or black swan events, which can radically and rapidly change the system. One example is the contagion of the Arab Spring's violent disorder that was sparked by a single Tunisian street vendor setting himself on fire.

At a fundamental level, five pressures will interact to destabilise the security environment unless they are managed actively and intelligently:

- inter-state competition seeks to **'reorder'** the system,
- violent extremists seek to **'overthrow'** the system,
- criminals seek to **'subvert'** the system to their advantage,
- inequality, internal dissent and poor governance can **'undermine'** the system,
- natural forces have the potential to **'overwhelm'** the system through disasters, pandemics and environmental change.

From a security perspective, these pressures will manifest in the following ways. In the worst case, they will converge and mutate:

- **Conventional operations.** The post-Cold War stability has largely run its course. As states increasingly seek to renegotiate the world order, there is the risk of miscalculation that portends a return to the lethality of

Photo credit: REUTERS/Maks Levin

conventional operations.

- **Irregular threats.** All indications point to the enduring presence of irregular and insurgent forces using irregular activities to offset their comparative military weakness. One such tactic is the globalisation of terror.
- **Criminality.** Criminality will be a persistent and increasing feature of irregular activity. Globalisation, population growth and migratory pressures create unprecedented opportunities for criminal elements to subvert commercial and social structures to their own ends. Cyber criminals and 'hacktivists' in particular have global reach and some are willing to act as proxies for a price.
- **Human insecurity.** Creating security has a wider connotation than just addressing armed conflict. The future force will need to work with local authorities and with international police forces and judiciary to concurrently reduce insecurity, promote the rule of law and to build resilience to natural disasters.

Adversaries have adopted hybrid warfare to exploit the convergence of these pressures. They blend conventional and irregular methods with information and cyber tactics. To do so they form coalitions of convenience between states, extremists and criminals, create proxies, or employ their own special forces to work in the 'grey zone' just below the escalation threshold.

To compete with the challenge of hybrid warfare, the future land force must be confident at dealing with complexity.

Land forces must be able to operate on intent based orders and nuance their responses to match threats and opportunities that might not have been foreseen in doctrine.

## Increasingly Partnered

The complexity of the future operating environment means that military responses will not be sufficient on their own. Future operations will see the NZ Army operate alongside joint, interagency, multinational (JIM) and public partners. In addition, the requirement for partnered operations will be made necessary by the nature of NZDF operational objectives, defined in the FJOC as acceptable enduring conditions. These conditions will likely be linked to civil governance and services. Land forces will need to integrate a range of agencies and departments to ensure an All of Government effort can align with the desired success criteria.

CHAPTER TWO

# THE FUTURE LAND OPERATING CONCEPT

The ability to win in close combat is the ultimate relevance of the NZ Army and therefore it's primary capability determinant. The focus of the future capability programs will be to build an excellent light fighting force that is interoperable with and can leverage the capabilities of larger and heavier forces.

The previous chapter described the land operating environment out to 2035 within which the future land force will operate. The generic trends are fundamental in nature and are outside the ability of the NZDF to influence or change. However, the NZ Army can determine how to interpret, structure for and exploit the future operating environment to ensure it remains ready and relevant.

# THE NZDF'S FUTURE JOINT OPERATING CONCEPT (FJOC)

The NZDF Future Joint Operating Concept (FJOC) provides conceptual guidance at Defence level to ensure that the NZDF is fully prepared and postured as a joint force to meet future operational challenges. The FJOC highlights the need for combat-focused joint forces that are expeditionary by design and able to project and sustain force elements (including land forces) in the Pacific and elsewhere throughout the world, and be networked and interoperable with partners. In addition, the FJOC emphasised three force determinants:

- unified view of military operations, the 'one force' approach.
- acceptable enduring conditions as the NZDF's operational success criteria.
- the Joint Task Force concept to which the NZ Army contributes.

## The Unified View of Military Operations and the 'One Force' approach

The FJOC guides planners in overcoming the inherent challenges and complexities of military operations in the future environment. Figure 4 illustrates the NZ Army's response to the future's continuities and discontinuities.

The NZDF's 'One Force' approach underpins the development of flexible and comprehensive Joint, Interagency and Multinational responses: that can be used to prevent and resolve armed conflicts and to advance New Zealand's security interests.

The NZ Army will seek to build a force that excels in uncertainty. To achieve this, the NZ Army will need to generate forces that understand the principles and concepts of military operations, that are competent in a variety of tactical settings and have the confidence and are empowered to adapt to each new challenge. Education, training and the professional development of individuals will be essential, as will the practice of a robust, culturally ingrained concept of mission command. NZ Army personnel will also need to have a high degree of cultural competency so they can work alongside a range of different groups.

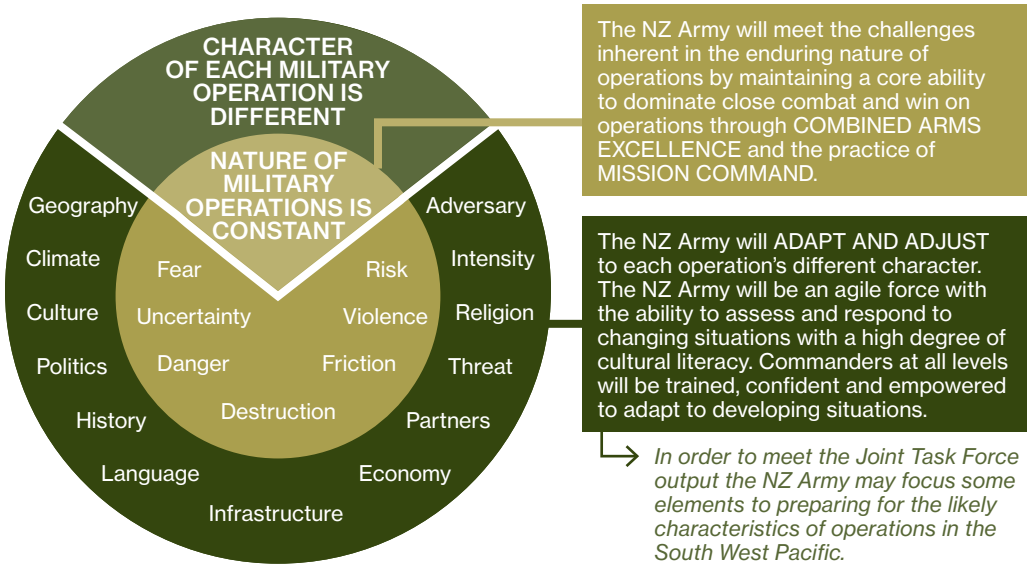



**Figure 4:** *The NZ Army's Approach to the Unified View of Military Operations (Adapted from the NZDF FJOC 2035)*

## Acceptable Enduring Conditions

'Acceptable enduring conditions' are the NZDF's operational success criteria for strategic design and decision making. The concept has evolved from binary zero-sum notions of 'victory' versus 'defeat' – that have frequently led to the resumption of hostilities within two to five years – to a broad-based, holistic interpretation for effective military intervention.

The thinking behind acceptable enduring conditions assumes a significantly deeper and broader understanding of the origins of instability. Effective crisis and conflict resolution strategies must be cognisant of the fears, identity and aspirations (fear, honour and interest) of affected populations. Such aspirations embody social, economic, political, religious, cultural, security and development dimensions. Ultimately, the goal is an enduring resolution of conflict, wherein affected parties – through a process of transition – can coexist within the norms, frameworks, and rules that govern acceptable social behaviour and political discourse among states and within states.

Depending on New Zealand's interests, the NZDF will either lead or support the achievement of acceptable enduring conditions. The NZDF might pursue a military-specific set of acceptable enduring conditions as part of an operational undertaking where the Government has indicated that the intention is to remove a threat to international order. Equally, the NZDF might be tasked to support inter-agency partners. Interagency support could be conducted outside the construct of a traditional military deployment for a sustained period (partnered capacity building efforts or military diplomacy and engagement are examples).

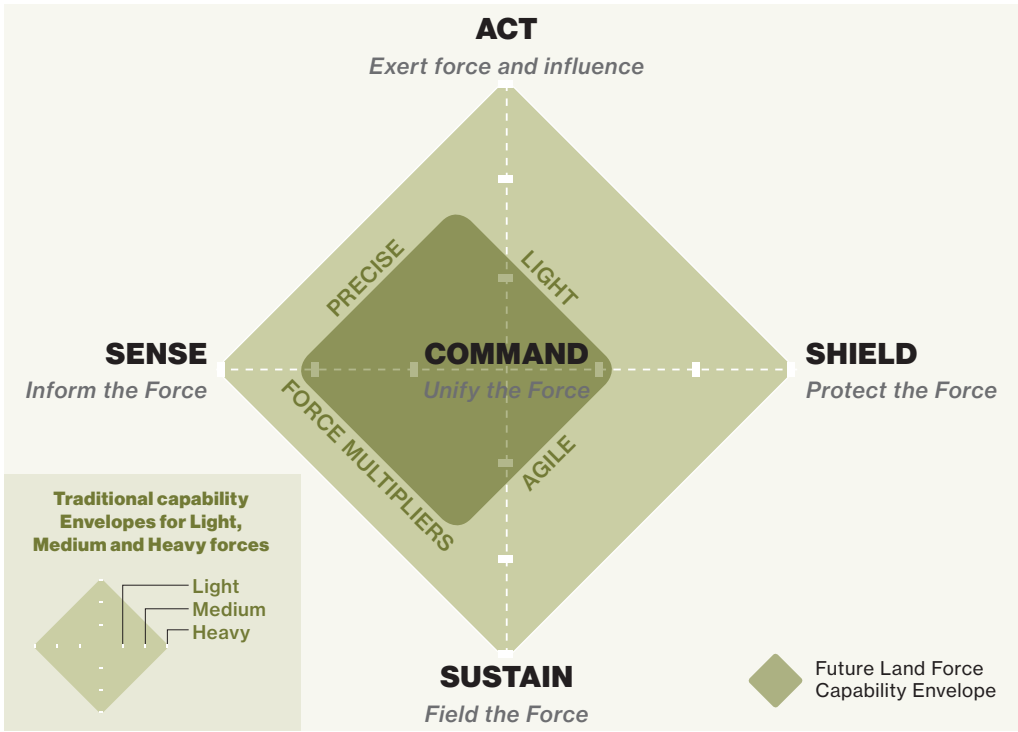



**Figure 5:** *The Future Land Force against ABCANZ Capability Themes*

# THE FUTURE LAND FORCE

## Summary

This section draws on the analysis in the sections above to outline four essential characteristics that will be required by New Zealand's future land and special operations forces. There are three types of forces: heavy, medium and light[7]. Some armies, like the US Army, have all three. Given resource constraints, the NZ Army is a light fighting force, therefore, it must be agile: able to do more than one task and transition between tasks quickly. It must also be precise, so that its limited combat power can be employed to greatest effect. Finally, the future force must employ multiplier strategies to generate effects that are greater than the sum of its parts.

## A Light Fighting Force

The ability to win in close combat is the ultimate relevance of the NZ Army and therefore its primary capability determinant. The focus of the future capability programs will be to build an excellent light fighting force that is interoperable with and can leverage the capabilities of larger and heavier forces.

7 A 'heavy force' is a force possessing a full range of combat and combined-arms capabilities, enabling sustained and high intensity close combat. Heavy forces possess armoured forces for close combat (including Main Battle Tanks and Mechanised Infantry) and high levels of firepower, including artillery such as Self-Propelled 155mm and rocket artillery systems, and close attack aviation (attack helicopters). Light forces, on the other hand, trade off the full spectrum of combat capabilities and lack the logistically demanding but powerful armour and fire-power of heavy forces for a more strategically mobile force.

The NZ Army needs to balance the competing reality of light forces that are agile and aware, yet by definition are also vulnerable to the increasingly lethal environment. As a result, force designers will need to make trade off decisions.

***Force Design Approach.*** Where high-end firepower and protection are beyond the reach of New Zealand's resources, investment should be prioritised to cutting-edge tools that let the force to sense, act and react faster and with better precision than likely adversaries. Emphasis needs to be placed on multi-skilling soldiers and where possible multi-role equipment. When required, specialist equipment should be, as far as is possible, agnostic of the platform on which it is hosted. For instance, communications modules should be designed to easily transfer between vehicles to maximise their utilisation and the adaptability of the force.

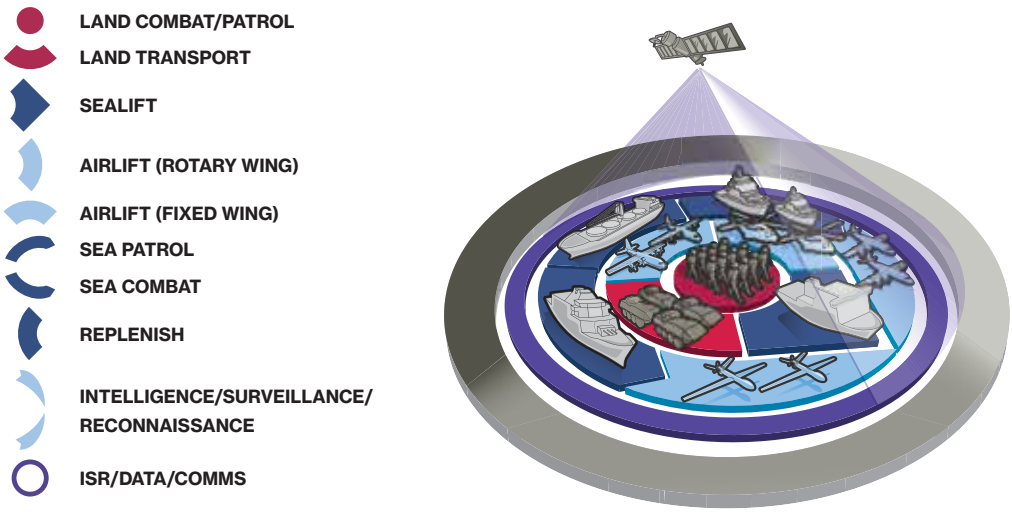
***Combined-Arms.*** Tactical success is founded on a force's ability to leverage the sum of its parts through combined-arms tactics. Used well, combined-arms tactics create a dilemma for the adversary who, in countering one element, is exposed to another. In the face of emerging tactics and technologies, combined-arms tactics will need to evolve to encompass additional capabilities, including information manoeuvre and remote and autonomous systems. Some existing Corps and trades will need to redefine their scale, skills and modes of operation or risk irrelevance. In a highly competitive environment the NZ Army cannot afford arms and services that do not effectively contribute to the application of combat power.

***Hardened.*** Within the light force construct there is still a requirement for future land forces to have protected mobility to survive. The future land environment will be crowded and heavily contested. Peer competitors will migrate Anti-Access Area Denial (A2AD) capabilities from the littoral and air domains to land operations. In so doing, it is likely that they will augment their missile defences with sensors, drones and robotics. Over time A2AD is likely to proliferate to proxy and irregular forces. Consequently, command nodes will have to command on the move and in the fight, and survival of the force will rely on clever management and obscuration of digital, physical and organisational signatures. NZDF personal protective equipment will also need to constantly evolve.

## Agility

***First Principles.*** The NZ Army's organising principle is agility. Agility maximises New Zealand's ability to deploy and redeploy task organised forces throughout the conflict spectrum. Agility is underpinned by austerity and simplicity. Used in the right measure, the Spartan virtue of austerity drives innovation, resilience and resource maximisation. Simplicity supports understanding, accountability and economy. Taken together, austerity and simplicity are the basic ingredients for an organisationally flexible force.

***Organisation.*** The FJOC requires forces that are flexible and rapidly scalable, so they can be tailored and task-organised to match the emerging character of a crises or conflict.
Yet to be effective in crisis requires professional depth that cannot easily be generated outside of professional




centres of excellence. Accordingly, the NZ Army organises functionally, on a regimental basis, and uses well practiced means to allocate elements from different regiments and corps into task specific organisations as and when required (task organising).

**Figure 6:** *The Joint Task Force of 2035*[8]

***Joint Integration.*** For independent New Zealand deployments, the NZDF establishes a Joint Task Force. Elements are drawn from across the NZDF and are commanded by the Deployable Joint Interagency Task Force Headquarters, which is permanently established under Headquarters Joint Forces New Zealand, for the purpose. The land force contribution is typically either of task group or task unit size and is structured to achieve the Integrated Land Missions that best achieve the desired acceptable enduring conditions.

***Expeditionary.*** New Zealand-led operations are likely to be regionally focused and joint and interagency in composition, as evidenced by the multiple capacity building, humanitarian assistance and disaster relief efforts the NZ Army has deployed on, often in the Pacific. Land forces must also be prepared to provide niche contributions to global challenges where NZ forces collaborate with or integrate into multinational coalitions. Recent experience reinforces this requirement: between 1990 and 2016 the NZ Army or contributed to 29 operational deployments, of which 26 were beyond the South West Pacific, with a heavy focus towards the Middle East and Africa.

***Task Organising.*** In keeping with NATO terminology, the NZ Army uses task organisation descriptors to identify outputs and force elements. Those descriptors are also used by HQ JFNZ, across NATO and are part of joint, naval and special operations lexicons.

8 New Zealand Defence Force (2012). *New Zealand Defence Force Future Joint Operating Concept.* Wellington; NZ, p 47.

## TASK FORCE (TF)

A TF consists of a headquarters, one or more Task Groups and non-military support elements as required. Typically, a TF is commanded by a Colonel or higher. In NATO, the term implies a Brigade (or above) level of command or headquarters structure. Within the NZDF context, the TF is the minimum level of organisation that can employ the full array of joint capabilities. TF command would normally be exercised by the Headquarters Deployable Joint Interagency Task Force (DJIATF).

## TASK GROUP (TG)

A TG consists of a deployable command post, one or more Task Units and non-military support elements as required. Typically, a TG is commanded by a Lieutenant Colonel. In NATO, TG implies a battalion level of command or headquarters structure. Within the NZDF context, the TG is the lowest level where a single commander can bring together the full range of combined-arms effects.

## TASK UNIT (TU)

A TU consists of a deployable command post, at least one Task Element and non-military support elements as required. A TU may operate independently or as part of a larger TG, and is the lowest level that can generate concurrent effects (when it has more than one Task Element). Typically, a TU is commanded by a Major. In NATO, TU implies a company / battery / squadron level of command or headquarters structure. Within the NZDF context, the TU is typically the lowest level that the NZDF will deploy on independent operations at strategic distance.

## TASK ELEMENT (TE)

A TE is a component of a TU and is employed to address a specific operational requirement. The level of command depends on the TE's complexity and the task requirements. Typically, a junior officer or non-commissioned officer commands a TE. Within NATO, the term TE implies a platoon / troop / section / patrol or detachment.
A TE typically relies on higher organisations for sustainment.

## Precision

The precise application of combat power is critical to agility and legitimacy. Consequently, precision is a fundamental aspect of New Zealand's approach to warfighting.[9] Three aspects are highlighted as being particularly relevant to the FLOC 35: digitisation, initiative and the pursuit of excellence.

***Digitisation.*** Precision will become increasingly possible as the Army digitises its command, control and communications networks under the Network Enabled Army (NEA) programme. Digitisation exploits advances in information systems, precise targeting, and discriminate delivery to:

- mitigate the NZ Army's lack of numerical strength
- minimise the detrimental effects of unintended damage
- maximise the impact of combat power at inflection points and times

***Initiative.*** Mission command creates a command climate of initiative taking that is responsive to higher direction. Mission command will remain central to New Zealand's approach to precision manoeuvre.[10] Two aspects are fundamental, first a clear understanding between superiors and subordinates of the purpose (the why) so when the situation changes subordinates can adjust 'how' they achieve their purpose. The second aspect is a command climate built on mutual trust.[11] Mission command is both enhanced and endangered by digitisation. While the future network allows commanders to see, understand, communicate and act faster than ever before, there is also the risk that commanders will become overly reliant on updates and directions from their superiors, or become too controlling themselves. To counter these risks, command teams should build a climate of trust in training, and should train to win in the absence of communications.

***Pursuit of Excellence.*** To have the operational edge over future adversaries, New Zealand forces must continually strive to be individually and collectively better than their opponents, who may well have superior local knowledge and who may well be more numerous. One means of doing this is to pursue mastery of distributed operations.

9 Manoeuvre Warfare is the foundation warfighting concept for all ABCANZ armies, it is defined as an approach to operations in which shattering the enemy's overall cohesion and will to fight is paramount. It calls for an attitude of mind in which doing the unexpected, using initiative and seeking originality is combined with a ruthless determination to succeed (JWP 0-01.1).

10 Mission command promotes agility through a leadership climate that can be described as 'freedom within a framework'. Higher commanders provide guidance to subordinates on 'what' and why'. Subordinates then do their own appreciation and then brief back the higher commander on 'how' they will achieve their assigned mission. At this point, additional resources, freedoms and constraints are negotiated between commanders.

11 According to Blanchard, trust has four elements: Commanders need to be Able, Believable, Connected and Dependable.

# AN EXAMPLE OF AGILITY AND PRECISION BY A LIGHT FORCE
## FRENCH INTERVENTION IN MALI, OPERATION SERVAL, 2013

Many of the principles, concepts and ideals of distributed operations can be seen in the French military intervention in Mali in 2013, known as Operation Serval.

In January 2013, an insurgency in Northern Mali had gathered momentum and was threatening the Mali state. The Malian government requested military assistance, which resulted in the French President authorising Operation Serval.

French Special Forces actively targeted insurgents from 11–15 January 2013, while French quick reaction forces deployed into Mali and formed the 'Serval Brigade'. Relying on intelligence and logistics support from coalition partners (including the United States, the United Kingdom, Germany and other NATO forces) and supported by French air power, the Serval Brigade secured their point of lodgement (the national airport) and blocked jihadist advances between 11–21 January. Despite having only Light Armoured and Light Infantry manoeuvre forces, the French went on the offensive from 21 January. Task Units seized key objectives using air and land assault tactics, synchronising with Special Force elements to shape each objective prior to it being seized by elements of the Serval Brigade. Objectives were rapidly handed over to forces from the United Nations Stabilisation Mission for Mali.

With rapid and audacious action, the French forces had blocked the jihadists' advance and then, as additional reinforcements arrived in theatre, commenced offensive operations focusing on the liberation of key population centres. On 30 January, the last major town held by the insurgents had been secured. While French forces led the offensive operations, they were supported by both Malian units and by other African troops, and at the end of the offensive operations the French force rapidly transitioned into a Capacity Building role.

French operations were characterised by Light Armoured, Light Infantry and Special Forces employing distributed manoeuvre over a sizable area of operations, operating in an extremely austere environment with supply and logistic support at an absolute minimum. However, the French maintained high quality medical support to deployed forces throughout. Enabled by French air power, the Special Forces and the Serval Brigade worked together to concentrate their limited combat power against key objectives, constantly re-orientating against each subsequent objective, generating a level of tempo that the jihadists couldn't match or recover from. This is a hallmark of distributed operations, with the French tactics enabled by a massive over-match in situational awareness.

Operating in a JIM environment, audacious offensive action executed by well trained and well equipped troops allowed the French forces to achieve their objectives and realise the acceptable enduring conditions their Government had set.

Sources: Tramound, O. LTGEN and Seigneur, P. LTCOL. French Army. (2014) Operation Serval, Military Review November – December 2014, pp 76–86.
Shurkin, M. (2014) France's War in Mali: Lessons for an Expeditionary Army, RAND Corporation, America.

## Force Multiplier Strategies

***Leverage.*** New Zealand forces must excel at generating leverage. This can be achieved with the creative use of surprise, technology, tempo, terrain and human understanding. For instance, by leveraging complex terrain, a small force can gain relative superiority over a larger one; as was aptly demonstrated in Thermopylae's mountain pass by Leonidas and in Petrograd's city streets by Trotsky. Or, by leveraging popular sentiment, a small movement or message can achieve exponential influence. Moreover, in operations among the people, the greatest leverage will go to the side that best understands how to mobilise and maintain the people's confidence.

*New Zealand forces must be ready to go into harm's way to build stability and reduce violence to law and order levels, in evolving situations that span the conflict spectrum.*

***Legitimacy.*** To win the confidence of the populace, the actions of New Zealand's forces must be, and be seen to be, legitimate. To achieve and set the conditions for future success, an intervention force cannot hope to be succeeded by legitimate civil governance if it does not first model proportionality, consistency, justice and respect. In most operations, it is not possible to simply coerce your way to success. New Zealand land forces must, at every turn, set the conditions to reduce violence, extend the rule of law and (re)build normalcy. Said another way, treating the causes of conflict is ultimately more important than defeating the symptoms. New Zealand forces must be ready to go into harm's way to build stability and reduce violence to law and order levels, in evolving situations that span the conflict spectrum.

***Synergies.*** In addition to combined-arms tactics, synergising special operations and conventional operations is one of the future land force's key force multiplier strategies.

Multi-role forces are organised, equipped, trained and led to win conventional operations which are generally sustained and overt military campaigns against defined threats or challenges. Conversely Special Operations Forces are selected, organised, equipped, trained and led to conduct operations of strategic significance that are focused, often discreet, unorthodox and frequently high-risk.

Used together, multi-role and special operations forces create opportunities for the other while covering each force's vulnerabilities. Multi-role forces have greater numbers (and therefore operational persistence) and greater combat power than special operations forces. Therefore, they are more suited to securing terrain (both physical and human) and sustaining their effects. For instance, special operations forces would not have been suited to sustaining the New Zealand Provincial Reconstruction Team in Afghanistan for the 11 years it operated. However, they were instrumental in establishing the conditions that enabled it to commence operations.

Special operations forces are best suited to strategic tasks with fine tolerances between success and failure. They are a strategic multiplier


Photo credit: Australian Defence Force

and achieve strategic results using the fewest possible resources. Typically, these tasks seek to undermine an adversary's centre of gravity or work to protect our own. For example, the special operations domestic counter terrorist capability supports the legitimacy and confidence in civil government. The mentoring of Afghanistan's counter terrorist police in Kabul is another example, in which NZSAS operations were used to increase the rule of law amid an insurgency. Often these missions require the assistance of multi-role forces to provide shaping or supporting effects and additional capacity, particularly in special skills such as communications, mobility, logistics, cross-cultural and cross-gender engagement.

***Interoperability.*** The NZ Army increases the Government's policy options by maintaining the ability to contribute to all-of-government tasks and by being able to work with partner and coalition forces. Interoperability has three levels: de-confliction, collaboration and integration. Each level generates more interoperability and therefore a greater ability to leverage the sum of the parts. However, the higher the interoperability level the more complicated and resource intensive the investment required.

- **Global Interoperability.** The NZ Army interoperability benchmark will continue to be American, British, Canadian, Australian and New Zealand Armies (ABCANZ) standards. It is from this benchmark that the NZ Army will continue to measure itself against its vision of being world class. Interoperability with Australia remains the highest imperative for New Zealand within the Five Eyes community. Interoperability with the US is a close second, given that the US pioneers the vast majority of technological developments and is often the lead nation within coalition operations.

NATO interoperability is also an important reference standard.

- **Regional Interoperability.** The NZ Army must maintain interoperability with Singapore and Malaysia as partners in the Five Power Defence Arrangement (FPDA), and with partner forces in the South Pacific. These interoperability arrangements contribute to regional stability and Security. They support situational awareness as well as linguistic and cultural literacy within the force.
- **National Interoperability.** The NZ Army needs to be able to integrate with the RNZN and RNZAF and collaborate with inter-agency and public partners. This is particularly important for national operations and operations in the South Pacific (see Figure 3) that are non-discretionary and require an integrated national response from a Joint or Joint Interagency Task Force.

***Innovation Culture.*** Warfare is a search for asymmetrical advantage. If New Zealand's land forces are to have a competitive edge, they must embody a vibrant innovation culture. This is particularly important for a fiscally constrained force. As New Zealand physicist Lord Rutherford famously remarked 'we've got no money, so we've got to think.' At the very least, every NZ Army member, uniformed and non-uniformed, can be an integrator and adaptor. This mindset is more important than first glance would suggest, because, as in business, the side that best integrates and adapts existing inventions often makes the greatest break-throughs in warfare.

CHAPTER THREE

# INTEGRATED LAND MISSIONS

*In a century where the global population is growing by over 200,000 people a day population protection and population support missions will become increasingly vital to security and prosperity.*

# INTRODUCTION

The NZ Army will seek to influence the future operating environment identified in Chapters 1 and 2 through the lens of five conceptual mission types, known as Integrated Land Missions. Future NZ land forces will:

- undertake Integrated Land Missions to achieve objectives through tactical action and information activity (first-order impact),
- that result in Influence Effects (second-order impact),
- that in turn contribute to acceptable enduring conditions (success criteria).

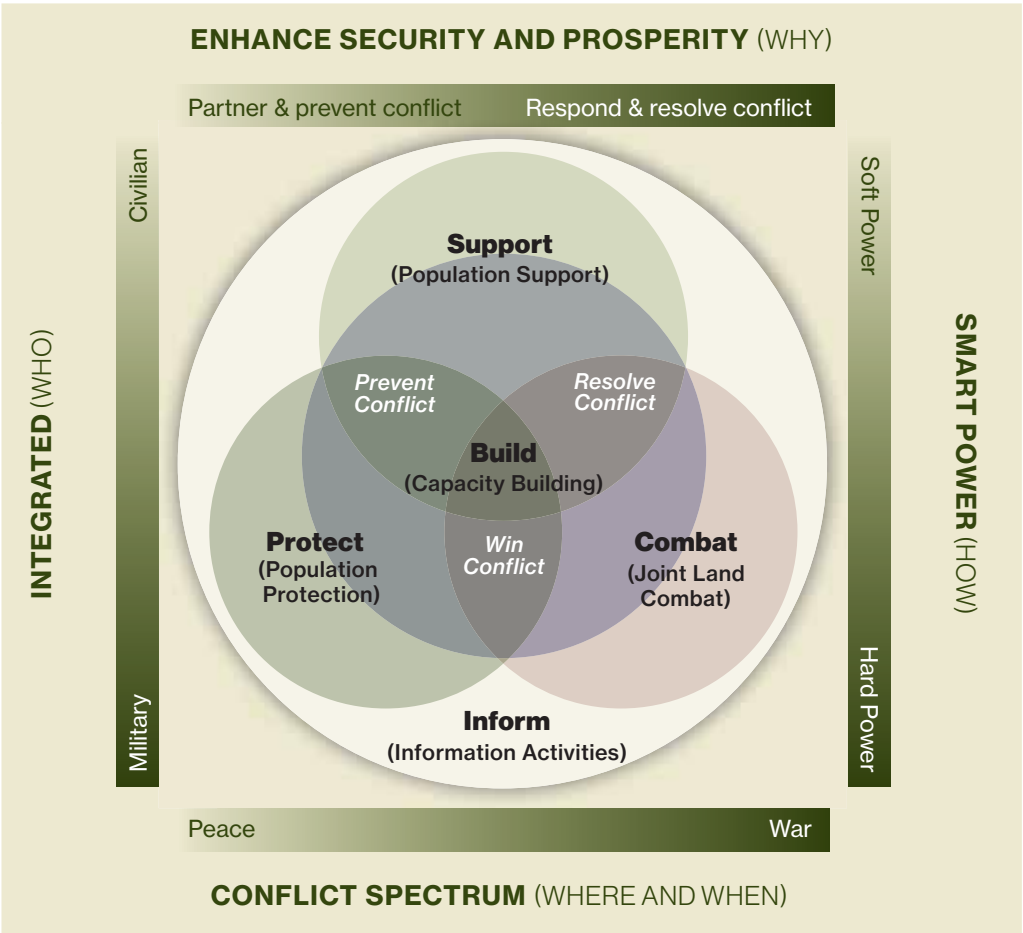



**Figure 7:** *The Integrated Land Missions*

# INTEGRATED LAND MISSIONS AS PART OF THE FUTURE LAND OPERATING CONCEPT

Integrated Land Missions have been adapted from the Australian Army's *Future Land Operating Concept 2009* – 'Adaptive Campaigning' – which described the missions as 'five interdependent and mutually reinforcing lines of operation'. New Zealand's five land missions are:

- Information Activity – to **inform** operations and audiences
- Capacity Building – to **build** stability
- Joint Land Combat – to **combat** enemy forces
- Population Support – to **support** communities and civil authorities
- Population Protection – to **protect** societies

Figure 7 illustrates the inter-relationships between Integrated Land Missions. Of note, information activities are a unifying activity within all missions. Increasingly, capacity building is central to preventing or, when necessary, winning and resolving armed conflict. Most important though is human security. In a century where the global population is growing by over 200,000 people a day[12] population protection and population support missions will become increasingly vital to security and prosperity. This will be even more so by 2035, given the confluence of climate change, population growth, mega cities in the littoral regions of Indo-Asia Pacific and increasing resource pressures. Ultimately, however, if armed conflict cannot be prevented it must be won through joint land combat, before it can be resolved and acceptable enduring conditions re-established.

Each Integrated Land Mission requires a different capability mix and operational emphasis. In practice, missions will often be employed concurrently, which reflects the complexity of the operational environment. For instance, population protection missions may need to be enabled by joint land combat. Whether the objective is to prevent, resolve or win armed conflict, land missions will integrate military and civilian efforts in

12 United Nations Department of Economic and Social Affairs (2014). Concise Report on the World Population Situation in 2014. New York; United Nations, p 2.

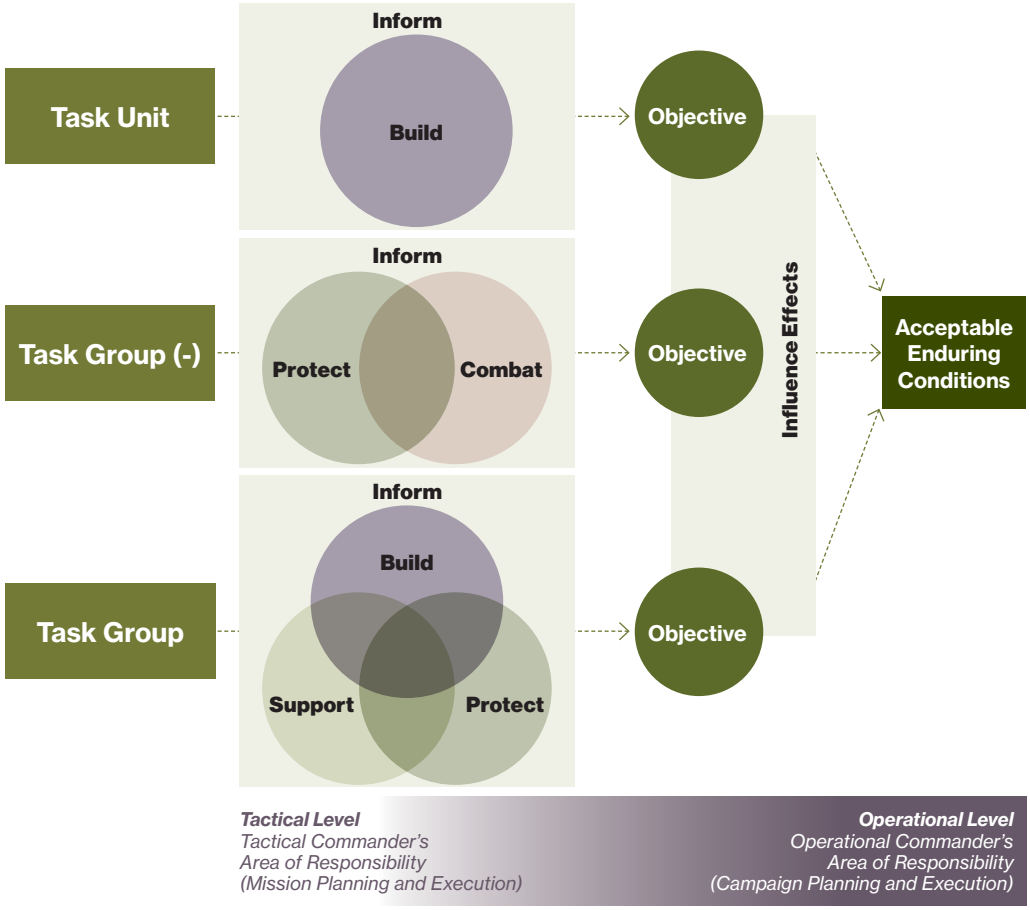



**Figure 8:** *Indicative Execution of Integrated Land Missions under the Future Land Operating Concept*

varying degrees to exert both hard and soft power – a combination political scientist Joseph Nye calls 'smart power.'

Integrated Land Missions focus the tactical actions of a force to achieve set objectives. When achieved, objectives contribute to the desired influence effects – which in turn will lead to the realisation of acceptable enduring conditions. Ensuring the Objectives (means), Influence Effects (ways) and acceptable enduring conditions (ends) remain linked and relevant is part of the operational art practised by operational level command teams and by HQ JFNZ.

Influence Effects are not a mission in themselves, but rather link the outcome of tactical action and missions to the overall campaign plan.

Integrated Land Mission terminology does not replace operations defined in doctrine, but rather clarifies the focus for capability sets and outputs required to achieve those operations (as shown in Figure 9).

## INFORMATION ACTIVITY

Information Activity uses information to inform, enable and support all forms of manoeuvre. It can include efforts to

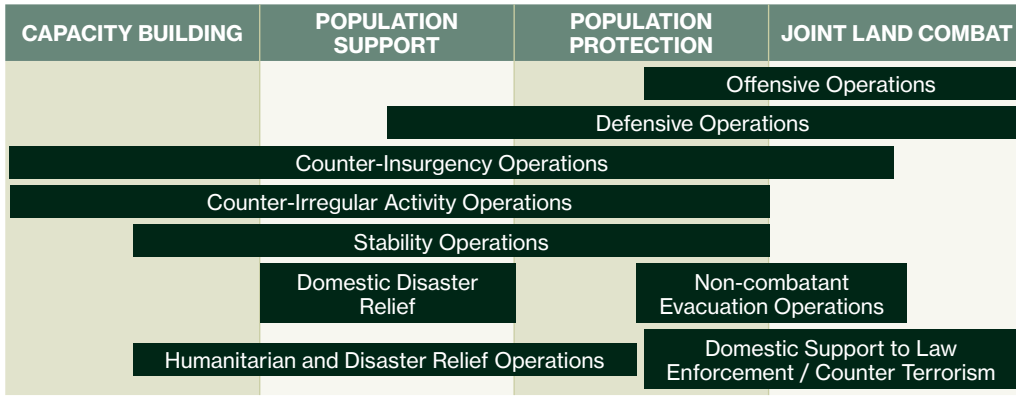



**Figure 9:** *Integrated Land Mission capability sets contributing to possible NZDF Operations*

encourage preferred behaviours, or to confuse or weaken an adversary. Information Activity is both an 'all arms' skill and as a specialist activity conducted by individuals and force elements trained and equipped for the specific role. Information Activity will include the tasks and activities shown in Figure 10.

The importance and relevance each sub-task will inevitably vary according to the needs of each mission. How Information Activity is integrated is dependent on future force design and capability development. Commanders at all levels and across multiple units will need to be confident in planning and employing Information Activity to ensure NZ Army forces can respond to, adapt and overcome competing influences in the future operating environment.

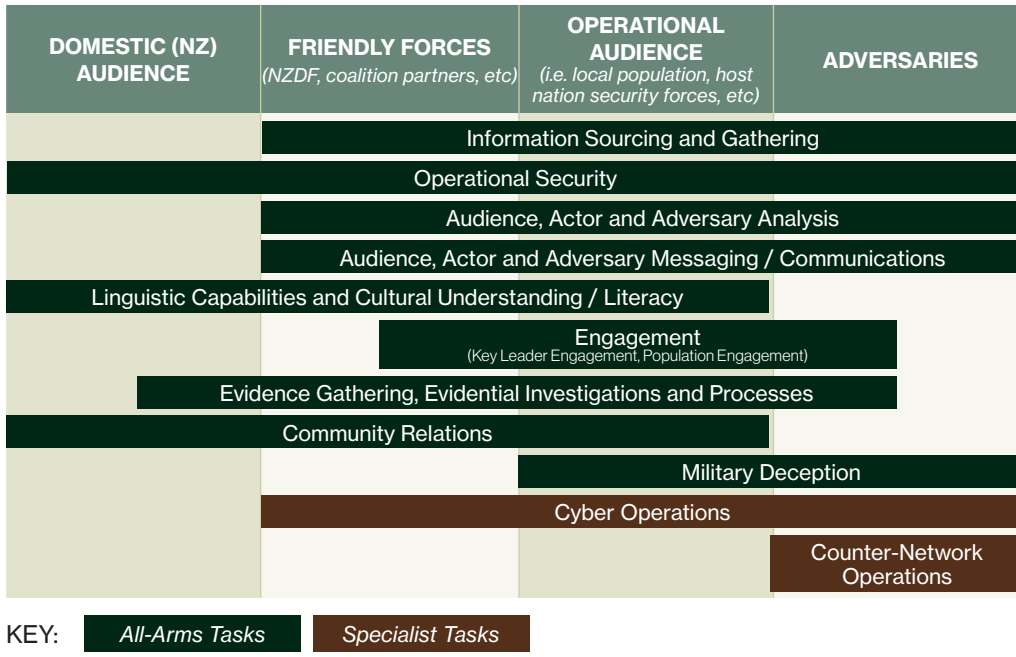



**Figure 10:** *Indicative Application of Information Activities for Different Audiences*

# JOINT LAND COMBAT MISSIONS

Joint Land Combat involves application of sanctioned violence through close combat in pursuit of operational objectives. It may include action to secure a designated environment, remove organised resistance, enable other Integrated Land Missions to succeed and set the environment for acceptable enduring conditions to be realised. For instance, capacity building audiences take greater note of land forces that have credible hard power capabilities.[13]

*Joint Land Combat involves application of sanctioned violence through close combat in pursuit of operational objectives.*

13 General Sir Nicholas Carter (2015). *The Future of the British Army: How the Army Must Change to Serve Britain in a Volatile World*, Chatham House, London; United Kingdom, p 5.

Joint Land Combat is conducted as a joint effort, to deliver land power or in support of air and maritime manoeuvre. Given New Zealand's strategic and geopolitical context, Joint Land Combat is most likely to be conducted as part of a coalition effort.

# CAPACITY BUILDING MISSIONS

Whether attempting to prevent or to resolve conflict, capacity building is often on the critical path to realising acceptable enduring conditions. Capacity building can take many forms. It may form the basis of an entire operation, or it can be combined with other objectives within Integrated Land Missions, including within an interagency operation.

Capacity Building falls into three broad categories:

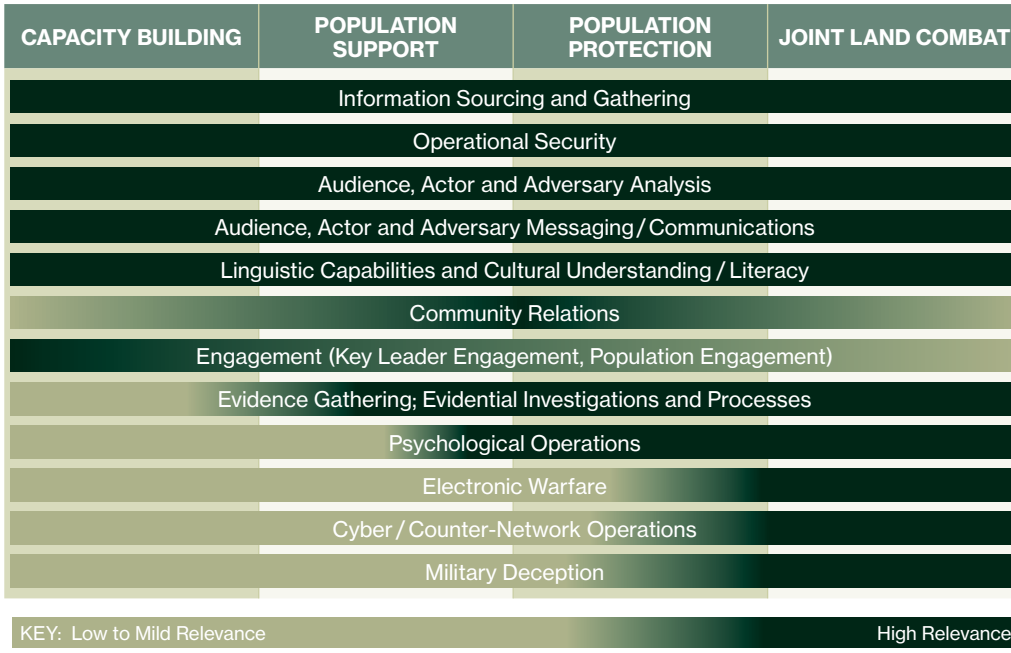



**Figure 11:** *Indicative Application of Information Activities by Land Mission*

<table>
<tr><th>MILITARY CAPACITY BUILDING</th><th>SECURITY SECTOR REFORM (SSR)</th><th>CIVIL CAPACITY BUILDING</th></tr>
<tr><td colspan="3">Political Reconciliation and Settlement</td></tr>
<tr><td>Training</td><td colspan="2">Security and Justice Reform</td></tr>
<tr><td>Mentoring</td><td colspan="2">Policing / Border and Immigration Control Reform</td></tr>
<tr><td>Capability Advice</td><td>Disarmament, Demobilisation and Reintegration</td><td>Emergency Services</td></tr>
<tr><td>Staff Support</td><td>Military Reformation / Transformation</td><td>Local Governance (including Public Services)</td></tr>
<tr><td></td><td></td><td>Central Governance (including Strategic Communications)</td></tr>
<tr><td></td><td></td><td>Financial Systems</td></tr>
<tr><td></td><td></td><td>Administrative Systems</td></tr>
</table>

*Increasing Demand for an All-of Government Response*

**Figure 12:** *Components of Capacity Building*

Future Capacity Building efforts will ideally be orientated to Military Capacity Building or Security Sector Reform, where NZ Army personnel will have the professional background and military expertise required for the role. However, Civil Capacity Building may fall to NZ land forces as a last resort when and where civil organisations are unable to function, due either to threat levels or to physical inaccessibility (especially if airports and coastal facilities are closed to civilian access).

Capacity Building has leadership and communication implications for the future land force. Future commanders will need to have a working understanding of civil governance systems and an inclusive leadership style. Future communications networks will need to handle unclassified as well as classified traffic and will need to have the bandwidth and reach that allows force elements to be remotely connected to subject matter experts when they are not physically present.

NZ Army personnel need to work with a variety of cultures throughout their careers. Capacity Building will be most successful if trusted relationships and cultural competency has been established beforehand. Linguistic support can be outsourced to interpreters and translators, but the characteristics and qualities that will allow the land force to form effective relationships must be inherent.

Starting with the ends in mind is a key requirement for successful capacity building. Often, to quote from James Joyce's novel Ulysses, 'the longest way around is the quickest way home.' Planners should resist the temptation for quick results, which are often superficial, and instead build the foundations for enduring acceptable conditions from the outset. Transition of authority and responsibility to the host nation should also be planned at the outset and progressively enacted, which will assist the military mission to succeed.

# AFGHANISTAN 2001–2016

Between 2001 and 2016 the NZDF deployed more than 3,500 personnel to Afghanistan, with the majority serving in Bamyan province as part of a Provincial Reconstruction Team (PRT), assisted by elements in Bagram and Dubai. In addition, there were four separate deployments of NZSAS between 2001 and 2015. The NZ Police and MFAT have also made key commitments to Afghan stability.

The characteristics and manner of capacity building in Afghanistan varied greatly, with the PRT conducting capacity building on extended patrols between Afghan National Police (ANP) check-points and through the mentoring of ANP training. NZSAS capacity building saw force elements both train and partner with what became one of Afghanistan's most elite special police organisations, the Crisis Response Unit. NZ Army elements also contributed in an instructional and mentoring role at leadership academies and military schools.

# POPULATION SUPPORT MISSIONS

Population Support contributes to acceptable enduring conditions by establishing, restoring or temporarily replacing essential services in affected communities, to reduce human suffering or avert the loss of life. Effective population support is a collaborative effort; it must support indigenous governance systems. Campaign design should include multi-agency representation and, where possible, industry, NGOs, and media. Campaign design may incorporate capacity-building efforts.

Given the environmental challenges in the Pacific, population support missions will continue to be a common contingency task – particularly in the cyclone season.

To conduct population support missions effectively, NZ land forces require the following capabilities and characteristics:

- ***The ability to provide emergency relief (ER).*** ER mitigates the negative consequences of human conflict, natural disaster, or civil catastrophe by providing security, delivering commodities, managing displaced persons, making expedient repairs to infrastructure and supporting civil authorities. From a military perspective, ER is short-term, has limited objectives, and aims to have a limited footprint.
- ***The ability to provide emergency rehabilitation and reconstruction (ERR).*** ERR enables civil authorities and industry to sustain the population. It creates the foundation for long-term development and must closely align to long-term rehabilitation efforts. Military efforts help to restore or reconstruct essential services and associated infrastructure that have been damaged, destroyed, or denied to the indigenous population. Delivery of ERR is more resource intensive than ER because it is sustained over a longer period.
- ***Collaboration.*** Wherever possible, the NZ Army will work as part of an inter-agency effort. Interagency and NGO efforts can be thwarted without adequate security and support. Consequently, the land force often becomes the essential enabler until the situation moves closer to a stable equilibrium. As the campaign progresses, the military role will reduce in favour of increasing local industry, NGO, and contractor capacity.
- ***Foresight.*** Population support missions must avoid creating false dependencies and unrealistic expectations. Often the urgency of the situation will demand an immediate injection of commodities (food, water, clothing, shelter) to maintain popular confidence and effective governance. However, without foresight and relevant measures of effectiveness, longer-term population support efforts can create inflation and opportunities for exploitation. If allowed to occur; such maladies ultimately undermine government legitimacy and create opportunities for threat groups to gain influence.

# POPULATION SUPPORT IN VANUATU 2015: OPERATION PACIFIC RELIEF

In March 2015, Tropical Cyclone Pam struck Vanuatu. The category-five system, with winds of up to 250 kilometres per hour, caused widespread devastation, leaving around 75,000 people in need of emergency shelter, and 96 per cent of food crops destroyed.

During the months following Tropical Cyclone Pam, the NZDF provided more than 350 personnel to assist with Emergency Relief tasks. In particular, the NZ Army and HMNZS CANTERBURY were able to deploy land force elements into the worst-affected areas. Alongside the Vanuatu Government and international efforts, the NZDF helped repair 12 schools and eight medical centres; installed four water reticulation systems; cleared 11 kilometres of road debris; and delivered more than 120 tonnes of supplies such as food, water, and other emergency items.

Operation Pacific Relief prevented further human suffering in the affected communities. It also demonstrated a high degree of civil-military cooperation and New Zealand's commitment to the region and to its neighbour's in time of need.

# POPULATION PROTECTION MISSIONS

Population protection sets the conditions to establish or re-establish civil governance and the rule of law.

The immediate objectives of Population Protection missions may include:

- De-escalation of civil unrest and the restoration of security.
- Securing designated assets, capabilities, facilities or properties.
- Securing a population or designated groups within a population.
- Securing a civil activity or process (for instance, evacuation or voting).

Long-term objectives are linked to the achievement of acceptable enduring conditions, and population protection may well be complimented by other Integrated Land Missions, such as capacity building.

To conduct population protection missions effectively in the future operating environment, NZ land forces require the following capabilities and characteristics:

- **Legitimacy:** Legitimacy is reinforced by the NZ Army's characteristic of precision, which minimises the likelihood of unintended consequences.
- **Agility:** Given the fluidity of threats it is essential that land forces can transition quickly between close combat and population protection.
- **Adept at information activities:** Information activities inform, enable and reinforce popular confidence and are the essential ingredient to enduring results (see Figure 8).
- **Less-lethal capabilities:** Less-lethal options allow commanders and soldiers the ability to establish security within a populated environment without having to immediately resort to lethal force. However, threats morph quickly, and less-lethal options do not replace the deterrent value and the force protection provided by lethal means.

# POPULATION PROTECTION IN TIMOR LESTE 1999–2012

NZ Army forces contributed to the stabilisation and security of Timor Leste in two different settings as part of Population Protection missions. This included:

- The deployment of an NZSAS Task Unit and an infantry battalion (Task Group) in 1999 to secure the population from militia groups. NZ forces first re-established security in the capital Dili, before occupying Suai province and conducting stabilisation and security operations over a large, predominantly rural area of operations.
- The deployment of an infantry company (Task Unit) to Dili as part of the Australian-led International Stabilisation Force to stabilise the security situation in 2006–2012, to deter a small group of rebels from local Army forces from further violence in urban and populated areas.

In both operations, NZ Army forces conducted a Population Protection role as part of an international coalition, under varied conditions and with tasks ranging from extended rural patrolling to close liaison and mentoring of host-nation security forces in urban centres.

Colonel Martin Dransfield commanded the second Infantry Battalion rotation in 1999. When he returned to Timor in 2011 as the Military Advisor, Colonel Dransfield witnessed a return to normalcy in Timor-Leste, which he describes as follows:

*'Today the schools are full, the kids are wearing uniforms, the markets are busy, and there is an air of confidence that comes from living in peace.'*

CHAPTER FOUR

# FUTURE LAND CAPABILITIES

# INTRODUCTION

This chapter identifies those areas of capability development that are critical for the future land forces and the conduct of Integrated Land Missions. For conceptual clarity, force design and capability requirements are discussed under the ABCANZ Armies' five capability themes, shown in Figure 13 below. To orientate NZDF capability staff, the five themes, where appropriate, will also be related to the NZDF's seven fundamental capabilities (command, inform, project, protect, prepare, operate and sustain).

By 2035, the NZ Army will be:

- ***Digitised –*** task organisations will be network enabled and able to leverage joint and combined assets.
- ***Agile –*** commanders will be able to see, understand and act faster– because of digitisation, land ISR investment, and an organisational approach that promotes austerity, simplicity and resilience.
- ***Hardened –*** with weapons, vehicles and equipment matched to the likely tasks, terrain and threats.
- ***Prepared –*** workforce planning, infrastructure and training models will optimise combat power.
- ***Efficient –*** logistics and medical systems will be resilient, expeditionary and technologically smart.

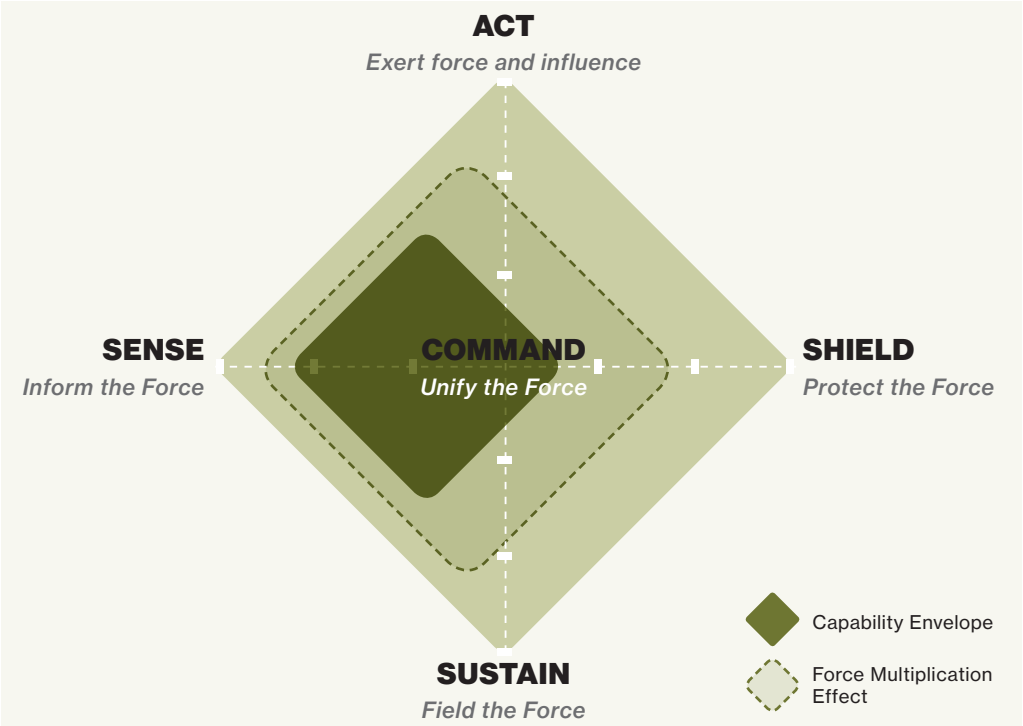



**Figure 13:** *Future Land Capabilities*

*Command unifies the efforts of a force and is therefore central to military success.*

# COMMAND

## Summary of the Capability Required

Command unifies the efforts of a force and is therefore central to military success. Capability development should focus on enhancing all elements of the future leadership's ability to lead, make decisions, communicate, and control the force. Command occurs in a partnered and complex context and operates best through a mission command philosophy. The functional tools required to exercise command in the future operating environment include command support, as well as tailored headquarters, and reach-back.

## Command Support

The complexity of modern and future operations means it is impossible for individuals to command alone. Consequently, command support will be prioritised as a function alongside combat, combat support and combat service support. Command support personnel include communications, intelligence, evidence, battle management, operations and administrative staff. These personnel operate the command and control nodes, the networks, manage the information domain and synthesise the operational information as it comes to hand. They free commanders to lead, decide, and communicate effectively.

## Headquarters – Scalable, Agile and Protected

Headquarters (or command posts) will be task organised for each operation. Headquarters for population support missions will be different to ones organised for joint land combat. Population support will require different staff (often engineers, logistics and medical personnel) and may need unclassified networks to better link with non-military partners and headquarters might be established in static locations with little concern for security. In combat operations, headquarters are a valuable target. Consequently, they must be designed and practiced at commanding on the move and in the fight. Emission security and deception will also be key design principles for 2035 command posts.

## Leverage Reach-Back

With the advent of digitisation, command support personnel not critical to the daily running of the command post can be accessed through communications reach-back. Rear basing offers the opportunity for field commanders to be supported by larger data-sets and more powerful computing than those that could be risked in forward areas. As a minimum, Commanders will need physical representatives from operations, intelligence and information fusion staff. However, fewer deployed personnel reduces the size, complexity, cost and vulnerability of deployed command posts.

To be effective, reach-back relies on a stable and secure network with sufficient bandwidth. Continuity of support also needs to be assured. That said, in contested environments, communication networks may be

degraded, regardless of geographic dispersion. Reach-back can be a force multiplier but it is not a universal solution. It needs to be risk-managed as part of a scalable headquarters design against the environment, capability requirements and – most importantly – the mission.

# SENSE

## Summary of the Capability Required

Sense is intrinsically linked to command, but it also enables all other functions (act, shield, sustain). The sense capability required by the NZ Army will enable the land force to find and understand actors in a range of domains. It relates to the NZDF capability 'inform'. By 2035, land forces need to have a well-developed baseline ability to operate in information degraded environments. Building on this baseline, force development focus should be to integrate a deployable digital network into the Army's structures, training and modes of operation. A key benefit will be the ability to exploit Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) and Electronic Warfare (EW) systems as part of the Land ISR capability. This will ensure future land forces are agile, precise and can multiply their effects.

## Situational Awareness versus Situational Understanding

Future land ISR capabilities will provide land forces situational awareness from which they will develop situational understanding.[14] Situational understanding is a valuable

14 Understanding is defined as the perception and interpretation of a situation to provide the context, insight and foresight required for effective decision making. It is about making better decisions based on the most accurate depiction possible.

force multiplier, as it combines insight (current situation) and foresight (future options). The in-depth knowledge of specific areas and domains necessary for understanding requires expertise and resources, including time. To leverage understanding, the sense and command functions need to be integrated. The first step in this process is creation of the Mission Command Training Centre (see pages 71–72).

## Baseline Capabilities for a Degraded Environment

The NZ Army will need to actively maintain, test and reinforce its ability to function in the absence of digital networks and systems. It is extremely likely that the future battlefield will feature a contested and a degraded cyber-electromagnetic spectrum. Even irregular forces will have access to basic offensive and defensive cyber, counter-network and electronic warfare capabilities that have the potential to interfere with NZ Army communications networks.

To remain agile, future land force exercises must routinely practice the degradation of power sources and electronic systems. This is essential to ensure future land forces do not suffer shock, decision paralysis or compromised levels of force protection in the event of network attack and denial. The use of mission command will be the key mechanism that empowers independent, dispersed formations to sustain operations in the absence of centralised network access. Hardened and redundant systems will also be required to mitigate risk.

## Deployable Networks

The future land force will operate in an information environment provided by a deployable network that links land forces in an area of operations, connects them with the operational and strategic levels, and enables interoperability with partners. Understanding and exploiting the deployable network will be essential to future operations. The key requirements include:

- ***Hardened and secure –*** the network must be protected from compromise and disruption wherever possible, and deployed personnel must be able to defend the network. In addition to normal PACE planning (primary, alternate, contingency and emergency), the information environment will be designed to withstand cyber-electromagnetic attack and to ensure sufficient minimum functions can continue in the absence of the primary C2 systems.
- ***Interoperable –*** enabling integration within a Five Eyes command and control environment and allowing for information to be tailored and shared amongst other partners.
- ***Intuitive and instructive –*** decision support tools will be intuitive and based on open architecture standards that allow them to be leveraged across multiple applications.
- ***Fused information –*** analytical tools will refine data into actionable information and intelligence. Actionable information will be shared through Common Operating Pictures that are tailored to the viewer's requirements.

- ***Capacity –*** deployed networks must have the capacity to deal with the velocity, veracity, volume and variety of information required to conduct operations.
  - ***Shared Situational Understanding –*** all levels of command will have the ability to access and contribute to Common Operating Pictures thereby increasing their situational awareness, understanding and operational tempo.
  - ***Partnered –*** given the velocity of technological change, industry support will be required to develop, integrate and maintain the technical, administrative, and operational needs of the future-network environment. This is particularly so in the case of software development and artificial intelligence. The NZ Army will remain reliant upon the NZDF CIS Branch and other Government partners to secure and sustain a deployable network.

## Every Individual and Platform Connected

The increasing pace of future land operations will require individuals and equipment to regularly connect to the network so they can receive and provide updates on locations, status and situation. Much of this will be able to occur as a background data transfer, thereby freeing personnel up to focus on their operational tasks while headquarters staffs optimise resource allocation.

Soldier systems development will need to include smart materials and power management, to safely digitise the soldier with minimal weight imposition. Operational enhancements should include visual and aural displays, including augmented reality, that enhance situational understanding without distracting soldiers and commanders from the environment around them.

## Cyber Electromagnetic Activities (CEMA)

CEMA includes Electronic Warfare, Cyber and Counter-Network Operations. Decision authorities to conduct CEMA may be held at high levels given the ability for them to impact beyond geographic theatres. However, to be competitive and protected, the land force must possess cyber and electromagnetic capabilities that can acquire targets with precision and are sufficiently tailorable to allow CEMA to be employed tactically as part of Information Activity.

## The Future Land ISR System

ISR is the land force's eyes and ears. It has utility across all Integrated Land Missions. The information collected is fused in headquarters and transmitted across the tactical information environment so the land force can synchronise its efforts. The ISTAR system will be benchmarked against ABCANZ partners and will include:

- ***Intelligence.*** Resourcing the analysis function is a pressing requirement for a future Land ISR system. Leveraging solutions from the private sector is currently difficult to achieve, at least in the near term. Industry can confront the technical challenges of 'volume, velocity, and variety' of data with fixed infrastructure, on-call software engineers and commercial innovation. However, addressing veracity requires a workforce that


is extensively vetted and is, ideally, deployable. By 2035 it is likely that artificial intelligence will be extensively employed to maximise the volume, velocity, variety and veracity of fused information.

- ***Surveillance.*** By 2035 the NZ Army will need to have increased its use of persistent surveillance technology. By networking sensors with the tactical information environment, the future force will increase its situational awareness and, to some extent, mitigate its lack of numerical strength. Networked persistent surveillance will also support environmental monitoring, target acquisition and evidence collection.
- ***Target Acquisition.*** Basic targeting is an all arms skill. The future land force requires personnel qualified in calling for joint fires in each combat unit. Targeting is also a specialist skill, which will continue to be vested in the artillery and in special operations forces, supported by intelligence and legal personnel.
- ***Reconnaissance.*** Both multi-role forces and special operations forces (SOF) conduct reconnaissance, with SOF focusing on strategic tasks. Given that future operations are most likely to occur in urban and littoral areas, multi-role forces will need to broaden their extant rural reconnaissance skillset and will need to integrate remote and autonomous systems to increase their coverage, survivability and utility. Concurrently, they will need to incorporate human intelligence methods to ensure they can generate intelligence from the population.

## Airborne ISTAR

Airborne ISR is a force multiplier and in future operations its availability will be a 'go/no-go' criterion for many tactical tasks. Airborne ISR can be

either piloted or autonomous. To be effective, the system must be able to provide communications relay and full motion video for targeting acquisition, intelligence and evidence collection. By 2035, tactical level RPAS (nano, micro, mini) will be as ubiquitous as section machine guns. While they should be able to connect to the network, the land force's RPAS will be low altitude systems. Therefore, tactical RPAS will not remove the land force's need to access more capable airborne ISR platforms. Land forces will also need to be able to employ precision strike capabilities from airborne platforms, especially from coalition air forces.

# ACT

## Summary

The Act function involves the application of force and influence. It relates to the NZDF capabilities of 'project' and 'operate'. The ability to act is a product of combat power. The NZ Army's combat power rests on the combined moral, intellectual and physical attributes of the force that can be generated for each situation.

## Moral

> *'The moral is to the physical as three to one'.*
> *– Napoleon Bonaparte*

The reality of conflict means that young New Zealanders will be entrusted to make the right decisions and to stand their ground in combative and evolving situations, when they are tired, in danger, potentially isolated, and the consequences of their decisions (or indecision) are measured in lives lost or saved.

To achieve their objectives, future land forces must be well led, values-based and purpose-driven. The moral component of the NZ Army's combat power is based on:

- ***Purpose –*** the NZDF is 'a force for good'. As an ethical force, the NZ Army will be compelling in combat while maintaining a strong moral compass and empathy for those who it is sent to protect.
- ***Values –*** the NZ Army values are comradeship, commitment, courage and integrity.
- ***Culture –*** the NZ Army will continue to foster a soldier-warrior ethos that combines the warrior spirit of Ngati Tumatauenga and regimental esprit de corps with the organised lethality and discipline of professional soldiering.
- ***Leadership –*** the NZ Army approach to leadership is 'service before self'. Good leadership unifies people and is the 'driving force of all action.'[15]

## Intellectual

The intellectual component of combat power enables the force to rationalise and exploit the complexity of the future operating environment. Commanders will need to be skilled at finding integrated solutions and making sound decisions.

***Integrated Solutions.*** Land forces will have to apply combat power differently in a networked world where sovereign security is increasingly linked to human security and to the stability of the international system. Within the

15 United States Marine Corps (1997). *MCDP-1 Warfighting,* Department of the Navy, Washington; America, p 14.

2035 timeframe, land forces will need to become increasingly skilled in the application of smart power.

Smart power is the combination of hard power (the ability to compel) and soft power (the ability to influence without coercion). As discussed in Chapter Three, Integrated Land Missions employ both forms of power simultaneously. Joint land combat seeks to destroy the enemy and is therefore hard power focused, while at the other end of the spectrum population support missions emphasise soft power. Some population-centric operations will involve destructive action, but only as a means to an ends, not as a primary objective.

## Decision-Making

History turns on the skill of decision-makers. As discussed in Chapter Two, the security environment is increasingly complex and this poses problems for military command and decision-making. Whereas complicated problems can be analysed in component parts and solved through linear analysis, this is not the true of complex problems. In operational settings military decision-makers will be faced with chaotic, complex and competitive situations. In organisational settings, decision-makers will need to make long-term investment decisions that balance competing needs across an increasingly complex and integrated organisation.

Leaders need to be quick learners, skilled at recognising patterns and able to simplify complexity sufficiently to enable adaptive action.[16] Key areas for development are:

- ***Psychology and Physiology.*** Better understanding of psychology and the physiology of the brain will enable tomorrow's soldiers to better access their intellectual and leadership potential.
- ***Decision support tools.*** Templates and heuristics speed up decision-making. As the field of understanding improves, there

16 Reed G., Bullis C., Collins R., Paparone C. (2004) *Mapping the route of leadership education: Caution ahead,* Parameters 34(3), Carlisle: PA; America, p 55.

will be methods that aid complex adaptive decision-making in the future operating environment.

- ***Wargaming and Red-teaming.*** Wargaming helps decision makers to plan beyond H-Hour by testing potential plans against team members who play an adaptive adversary. This allows courses of action to be compared and contingencies to be identified ahead of time. Organisational wargaming is equally relevant for testing and optimising capability and systemic investment decisions. Red-teaming differs in the degree of independence that the red team has to stress-test the blue-team's plans. Stress testing cyber security arrangements is one application. Red teaming has long been used on exercises and will be increasingly important in the future. Wargaming and red-teaming will need to be more deeply institutionalised in the future land force, to support operational success.
- ***Experimentation.*** Experimentation is a key element of adaptive decision-making. As discussed on page 38, there are obvious benefits in mobilising all parts of the Army to improve innovation. The NZ Army will continue to complement 'top-down' experimentation, as part of the capability process, with 'bottom-up' innovation. Future focus will be on capturing innovations and cascading them across the force, and in empowering innovators to be even more bold and creative.

## Physical

This section considers the physical application of force and influence. Currently fire and manoeuvre are how ABCANZ armies apply force. Warfare has evolved from chaotic melees to the rigid brutality of mass and now to sophisticated manoeuvre. The catalysts for change have been organisational development and improved communications.[17] Hence the

17 Aquilla J., Ronfield D. (2005) *Swarming and the Future of Conflict*,(RAND, Santa Monica: CA, America, p 17.

terms 'shoot', 'move' and 'communicate' are often used as short hand ways to consider an organisation's capacity for physical combat power. Rapid advances in the ability to 'sense' (see the previous section) and the rise of networking as an organising principle make it essential to engage in continuous professional debate and experimentation on how fire and manoeuvre might evolve by 2035.

## Manoeuvre

As discussed in chapter two, the Army's concept of warfighting is based on manoeuvre warfare and the pursuit of combined-arms excellence. As technology develops, the future land force will need to integrate new techniques to improve its ability to project force:

***Strategic Projection.*** As an island nation, New Zealand's principle means of strategic projection and recovery is by air and sea. Air has the advantage of speed and reach, but has less capacity and persistence than maritime projection. Sea basing or sustainment from the sea can provide the joint force commander persistence and options to reduce the land forces' footprint ashore.

***Operational Manoeuvre.*** In this context, operational manoeuvre includes tactical application. The primary means of manoeuvre have been air, maritime, and land. The means now include information manoeuvre and, increasingly, robotics manoeuvre by remote and autonomous systems. Land forces need to be skilled in multiple techniques within and between each form of manoeuvre.

***Air Manoeuvre.*** Air Manoeuvre requires an integrated approach between air, land and, at times, naval assets. Vertical lift, including rotary wing assets, will remain the primary preference for tactical air manoeuvre. It is a substantial 'force multiplier' because it increases tactical options for distributed operations and vertical envelopment. However, aircraft are inherently vulnerable to ground fire and constantly trade off distance and weight against altitude, temperature and visibility. Future land forces need to be 'air-minded' and habitually train with the RNZAF, to enable the following operations:

- Air Assault, to insert initial entry forces via vertical lift platforms (helicopter or tilt-wing aircraft).
- Airborne Operations, to insert initial entry forces by parachute from fixed-wing aircraft.
- Air-landing operations, to insert ground forces using fixed wing aircraft.

Multi-role forces will focus their skills on air-mobile operations, sling-loading equipment, cooperation with aerial sensors, and fire support. Some force elements, such as reconnaissance, special operations and high readiness forces, will also need to be skilled in rappelling, fast roping and parachuting insertion techniques.

***Maritime Manoeuvre.*** Maritime manoeuvre occurs in three loosely defined regions; blue water (the open ocean), green water (coastal waters, ports and harbours) and brown water (navigable estuaries and inland waters).[18] Oceans cover almost 71 percent of the earth's surface, but not all this water is of constant strategic

18 US Department of Defense, (2010) *Naval Operations Concept 2010: Implementing the Maritime Strategy*, Washington, DC; America, p 8.

relevance.

It is green and brown water that most heavily influences people's security and prosperity. For instance, in 2010, 80 percent of people lived within 60 miles of the coast and the world's economy remains largely reliant on unimpeded transit of goods through choke points such as the Suez Canal and the Malacca Straits. Of importance to land forces, green and brown water are incorporated in the littoral region – those areas which can be influenced from the sea and can influence the sea. Land and maritime manoeuvre in the littorals will be increasingly important in 2035, given the scale of urbanisation in the Pacific's littoral regions, the integrated nature of the global economy, and the expanding demand on maritime resources. For this reason, the NZ Army will continue to develop its joint amphibious skills.

For independent amphibious operations, the Joint Task Force will be able to progressively build-up forces in an area of operations. SOF will conduct advance force and strategic shaping operations. Main force operations are likely to be led by high-readiness combat elements capable of point-of-entry tasks, employing small boats and vertical lift to secure lodgement areas for a main body.

Once projected ashore, land forces will need the capability to exploit green and brown water. The NZ Army will retain a small boat and diving capability able to conduct limited littoral and riverine manoeuvre in the absence of RNZN support. In the littoral, land forces and maritime forces may be able to mutually support each other's manoeuvre with respective communications, ISR, fires and sustainment capabilities.

***Land Manoeuvre.*** To be adaptable and resilient in a changing environment, New Zealand land forces require tactical manoeuvre capabilities matched to the task, threat and terrain. Three complimentary and scalable modes of operation are required, each more capable but more resource intensive than the last:

- ***Dismounted.*** Dismounted combat forces have limited access to heavy weapons, vehicles and protected mobility platforms. To achieve their missions, they rely on surprise, physical fitness and resilience, initiative, a relatively small logistic tail and the ability to leverage complex terrain, fortifications, and local population support. If provided mobility and training, dismounted forces are broadly employable in mounted, armoured, air-mobile, airborne, and amphibious roles.
- ***Mounted.*** Mounted forces use Protected Mobility Vehicles for tactical manoeuvre. From a capability perspective, protected mobility is a combination of communications, firepower, protection, mobility, and sensors. The balance of this combination changes in accordance with the predicted threat levels within which the force will operate. Therefore, a range of protected mobility platforms will be required. Although Protected Mobility Vehicles provide mobility, protection and limited fire power, they are not suitable as assault vehicles.
- ***Light Armoured.*** To be effective on the future battlefield, New Zealand needs to maintain its light armoured capability. Light armour integrates infantry and infantry fighting

vehicles to leverage the armoured and dismounted capabilities of each. Infantry fighting vehicles greatly enhance the lethality, communications, speed and range of infantry. However, light armoured task organisations need support with similar mobility and protection, and as a result are larger and have a greater logistics burden than lighter (mounted or dismounted) forces. If augmented by coalition armour and offensive support, New Zealand light armoured infantry could form part of a medium-weight force.

***Information Manoeuvre.*** The potential for information to be weaponised has increased in the information age. An example is the 'stuxnet' virus that infiltrated its way into industrial computers and was used to disable Iran's nuclear centrifuges. If future land forces are naïve to cyber security, their physical manoeuvre capabilities will be monitored, disrupted and defeated. For instance, even commercial services such as the algorithmic structure of social media and the rise of 'surveillance capitalism' can be used as manoeuvre corridors. Consequently, cyber-electromagnetic activities and information activities are central to all Integrated Land Missions. Future land forces must analyse their audiences (allies, actors and adversaries) and then orchestrate hard and/or soft power, to wield ethical influence in an environment where adversaries manoeuvre via the brazen blurring of fact and fiction, and attack virtually as well as physically.

***Robotics Manoeuvre.*** Robotics manoeuvre is a developing form of warfare. It is likely to augment the land force's ability for distributed operations with swarming-like methods, among other attributes. Robotics manoeuvre has had its nascence in RPAS and experiments like the US Marine Corps Sea Dragon 2025. The potential for many low-cost systems to enhance a ground force's ability to see, understand, act and react has the potential to save lives and multiply the NZ Army's force ratios. It may also be an opportunity to partially reverse

the capability development trajectory of 'fewer-bigger-costlier' systems in favour of 'many-small-smart-cheap' ones.

The future land force will need to maximise use of remote and autonomous systems to ensure it maintains a competitive edge over adversaries. Units are encouraged to battle-lab how robotics can change the way they apply combat power.

## Freedom of Manoeuvre

Freedom of manoeuvre is enabled by access to the maritime and air environments, and on land by military engineers who use specialist equipment and skills to enhance the land force's mobility and survivability while countering the adversary's. By virtue of their skills, equipment and mindset, engineers also have a key role in population-centric operations. There is likely to be an increasing demand for engineers given growing population and climate change pressures, as well as the military implications of urban and littoral operations and the need to harden facilities against increasingly lethal adversaries.

The key development priorities to enable freedom of manoeuvre and survivability in 2035 will be:

- ***Urban operations.*** Engineers will need to synthesise their existing skills to create a cohesive urban operations concept. This includes infantry skills, breaching skills, obstacle and assault lane clearance. Firefighters must also be integrated to enable fire/crash rescue, decontamination, urban search and rescue, and forensic investigation.
- ***Green and brown water operations.*** Engineers will be required to support littoral manoeuvre, riverine operations, obstacle clearance and placement, bridging, and underwater construction both in support of the RNZN and independently in the absence of naval support.
- ***Increased capacity.*** Force designers will need to find ways to increase the future force's engineering capacity within fiscal constraints. Possible means include revisiting the need for assault pioneers in infantry battalions, increasing the scale and scope of Reserve Forces, and deepening the relationship with public partners (the civilian health volunteer scheme may provide an exemplar).
- ***New responsibilities.*** A lesson relearned in the Iraq War was that the absence of governance leads to disorder and undermines a force's freedom of manoeuvre. As a result, there is a period of time when land forces may need to institute military governance over liberated areas, until civil leadership can be re-established. Given the engineers' role in population-centric operations, they are a natural contender for this task. Force designers will also need to debate where and how the civil-military co-ordination role is best generated and maintained.

## Fires

In combat, there is no manoeuvre without fire support. As a light force, the NZ Army must mitigate the limitations in organic fires by maximising the ability to integrate the effects of others.

To remain effective and to survive in the future land operating environment, the NZ Army's offensive support capabilities will need to maximise:

- ***Targeting.*** Targeting is the key to effective fire support. The future land force needs to renew emphasis on this skill. High levels of interoperability with likely coalition partners will be essential. As the use of robotics increases, controlling and leveraging remote and autonomous systems may be an additional role for targeteers.
- ***Lethal Fires.*** Lethality is a product of accurate gunnery. The future force's ability to apply lethality enables manoeuvre, increases the survivability of New Zealand and coalition soldiers, and increases the land force's deterrent capability for non-lethal influence.
- ***Non-Lethal Fires.*** Less-lethal capabilities will assist the future force in maintaining legitimacy. Specific uses include the graduated application of force, the control of crowds and individuals, the immobilisation of vehicles and the temporary denial of areas. Investment may be required in less-lethal capabilities beyond those fielded by individual soldiers.
- ***Survivability.*** As a light force, special emphasis needs to be given to the ability to shoot and move quickly. Fires elements should have protected mobility commensurate with that of the manoeuvre forces. Investment should also be made into detection systems, such as radar, that warn of impending counter fires.
- ***Integration.*** Digital integration and leveraging ISTAR-EW assets including remote and autonomous systems, will be essential to faster target identification, accurate delivery of effects, and battle damage assessment.
- ***Weaponised Remote and Autonomous Systems.*** The NZ Army should closely monitor ABCANZ developments on artificial intelligence and remote and

autonomous systems; how they are armed and how they are controlled to ensure their effects are legal and ethical. Until such procedures, policies and systems have been established, the NZ Army should focus on autonomous systems that offer benefits to Land ISR, transportation and resupply.

## Influence

To generate operational influence, future land force leaders need to understand influence sources and application. According to French and Raven, there are two power sources – positional and personal. Positional power is based on the legitimacy of position, the ability to reward, to coerce and/or to control information. Personal power is based on respect and expertise.

Given the chaotic nature of conflict, it is likely that leaders will need to apply both personal and positional influence to achieve enduring acceptable conditions. However, the objective should be to migrate to personal influence over time.

Techniques to assist this will include:

- Linguistic and cultural competency.
- Social and political awareness.
- Listening, questioning and negotiation skills.
- The ability to model justice, proportionality and respect.
- Diversity of mind and team composition.

# SHIELD

## Summary of the Capability Required

The shield function preserves combat power and relates to the NZDF capability theme of 'protect'. Protection is a cross-functional, cross-capability

| | Do not be: | | | | | |
|---|---|---|---|---|---|---|
| | There | Seen | Targeted | Hit | Penetrated | Killed |
| Doctrine | | | | | | |
| Training | | | | | | |
| Intelligence | | | | | | |
| C2 | | | | | | |
| Mobility | | | | | | |
| Deception | | | | | | |
| Operational Security | | | | | | |
| Emission Control | | | | | | |
| Camouflage | | | | | | |
| Counter Measures | | | | | | |
| Armour | | | | | | |
| Health | | | | | | |

KEY: *Low Utility* *Medium Utility* *High Utility*

**Figure 14:** *Utility of Protection Efforts against the Survivability Spectrum (adapted from British Army sources)*

theme that every part of the future land forces needs to generate and support. Key development areas include risk management and survivability.

## Risk Management

To preserve combat power, future land forces need to be skilled at risk management. The Army's safety culture is a vital aspect of this. However, it is not possible to fully remove, isolate or minimise risk on the battlefield. In fact, success typically requires bold action. Therefore, all Army personnel need to be skilled at managing risks and understand causality, so they can predict and prevent or exploit second-order effects.[19]

## Survivability

Survivability requires more than just physical protection and defences. Over-reliance on these means can increase vulnerability because manoeuvre becomes cumbersome or defenders become complacent, as the Maginot Line and Britain's seaward fortifications of Singapore in World War II attest. Survivability is derived from the holistic application of all land systems and capabilities to protect friendly forces and to maximise combat power.

The British Army's Future Survivability and Protection Concept (Figure 14) is relevant to the development of the NZ Army's future protection capability. The survivability spectrum (avoidance to response) is matched to Army capabilities to show their utility in improving survivability across all aspects of land operations.

Survivability must be a design principle for all future land force capabilities. Current threats will evolve in parallel with our own adaptations and adversaries will seek to combine threats to maximise their impact. No singular capability will provide sufficient levels of force protection. Notwithstanding, it is worth highlighting the requirement to counter remote and autonomous systems as a developing area of focus.

As robotics manoeuvre develops, there is a corresponding requirement for counter-capabilities through denial, disruption and defeat mechanisms. Given the impending prevalence of drones, the ability to counter them will be both an all-arms responsibility (for smaller systems) and a specialist capability (for larger and more capable drones).

19 For a deeper discussion of this topic, leaders should read Defence Force Order 81 and the 2014 Marine Corps Order 3500.27C: Risk Management.

# SUSTAIN

## Summary of the Capability Required

The sustain function underpins combat power. It relates to the NZDF capability themes of 'prepare' and 'sustain' and includes the large variety of activities required to field a military force, maintain it in the field, and then regenerate it afterwards.

Preparation of the force is reliant on a disciplined work force that is properly trained, educated, experienced and equipped. Sustainment is reliant on combat services that are expeditionary, resilient and efficient.

## Building the Force

***Work-force challenge.*** The work-force challenge is to match supply to

demand throughout the value chain, from recruitment to retirement. The desired outcome is for the NZ Army to be able to adapt to and succeed in the 2035 operating environment because it has the talent to do so in the numbers required.

***Supply.*** As discussed in chapter one, demographics are changing. The New Zealand workforce will be older,[20] more multi-cultural and more urbanised. Consequently, recruiters must broaden their appeal from the NZ Army's traditional supply of rural European and Māori males. Equally, the mores and norms of society are also changing: this impacts on the aspirations and expectations of the future workforce. Individuals are more self-assured, more educated, communicate via digital networks, expect more personal control and greater choices, and are initially less accustomed and resilient to deprivation and physical hardship. They also tend to have less family mobility due to partners' careers, postponed parenthood, and more complicated family structures.

As a consequence, the policy paradigm needs to change from being directive and restrictive to one that is first-principles based and enables multiple pathways for success. Family stability, affordability and spousal employment will also increasingly be considerations.

***Demand.*** Hybrid warfare and New Zealand's response, Integrated Land Missions, will both challenge the future workforce and offer the chance to re-envision it. Force design challenges and opportunities will include:

- ***Diversity.*** To maximise the workforce, a holistic view of diversity needs to be taken when selecting talent and building teams. The output sought from diversity is the ability to connect with multiple audiences and improve problem-solving by bringing multiple mind-sets to bear. Nature and nurture are the primary inputs to diversity. Nature includes physical identity (age, gender, ethnicity) and personality traits. Nurture includes psychological identity (beliefs, belonging, culture), environmental upbringing and learning (training, education, experience). Despite its value, diversity is not a panacea: if team members are not properly acculturated it can be corrosive. The NZ Army's primary means of acculturation will remain basic training. The aim is to integrate individuals so they adopt the Army's culture without losing their identity.[21]
- ***The fiscal dilemma: quantity versus qualification.*** Population-centric operations require 'boots on the ground'. Urban operations, in particular, will absorb task organisations, as will the likelihood of increasing global instability. To enable operational speed and integration, there is a corresponding demand for more technologically-capable soldiers to support digitisation and the increasing variety in sophisticated equipment fleets.
- ***Expansion.*** Clausewitz said that

20 New Zealand's median age is predicted to increase from 38 years in 2015 to 41 years in 2035. National Intelligence Council, (2017). *Global Trends Paradox of Progress,* US National Intelligence Council, Washington, DC; America,p 162.

21 Berry, J.W. (1997) *Immigration, Acculturation and Adaption*, in Applied Psychology: An International Review,46 (1), International Association of Applied Psychology, p 10. Berry proposes a four-fold model of acculturation strategies; assimilation, separation, integration and marginalisation. Research shows integration to be the most productive strategy.

superiority in numbers is the most common element to victory. New Zealand regular forces are unlikely to enjoy this advantage, except in coalition. Therefore, force designers should build into the future force a means of quickly expanding Army numbers in time of crisis or protracted operations. Typically, this has been achieved using reserve forces. With the increasing cost of regular forces, force designers will need to revisit how the Army Reserve is leveraged. It may be necessary for the future force to have a higher number of reserves with different skills and readiness training requirements than the current Army Reserve.

- ***Citizen-soldiers.*** Converging threats mean that there are skills required by Integrated Land Missions that will be very difficult to grow and sustain in a conventional workforce model. Moreover, in an increasingly partnered environment, new ways need to be found to employ and deploy civilians in and alongside land forces. To address this, force designers should consider how Reserve Forces can be better blended with regular units. Consideration should also be given to selected civilian employees being offered 'auxiliary status'. Conceptually this would improve organisational agility by creating a middle option between civilian and soldier. In exchange for their willingness to post between roles and deploy in specialist roles they would receive career planning and increased remuneration. Citizen volunteers, as used by the medical community, could be expanded to other specialist fields also.
- ***Redefining Success.*** By 2035, both vertical and horizontal progression will be equally valid career choices. The reality of armed conflict is that reinforcements are inevitably required. In response, Army career planning has traditionally sought to give personnel broad employment profiles so they have maximum ability to step up in a range of roles. The downside of this approach is a high posting velocity that increases

the 'short-termism' of the Army – and therefore organisational tempo – to sometimes unhelpful levels. The corollary of complexity is the need to balance broad utility with depth. Therefore, the future force needs a percentage of the force to choose lateral progression (strength and passion) over vertical rank focus (titles and tenure). Workforce planners will need to model what that percentage is and consider the development of a general staff corps that provides command support at the strategic and operational levels and thereby improves decision support and accelerates the development of operational capability.

- ***Transition.*** Traditionally force levels have been regulated by the inflow of recruits. This has meant future talent is the first to be sacrificed when fiscal constraints are applied. In the event of a sudden outflow of existing talent, a double jeopardy is created because there can be no replacement in the absence of new talent. The future land force needs to manage transition out as carefully as recruitment in. Transition options include part-time service, as well as nuanced relationships with external organisations to help place and receive talent, and mechanisms for the ex-serving community to assist in placement and talent identification are required. Secondments that are fiscally neutral to NZDF will be valuable ways of building expertise, while providing a mechanism to increase the numbers in NZDF's talent pool and its external understanding. Finally, when personnel leave the service, they should be encouraged to join the reserves, maintain their security clearance, and return to uniform if and when mutually beneficial. If employed intelligently, transition can be a force multiplier.
- ***Community.*** Community trust underwrites the attractiveness of the military as a career choice. Army Reserve elements occupy a unique space in New Zealand's community. In addition to their operational roles, the Army Reserve maintains important historical and constitutional linkages to the community. Reserves constantly conduct a population support mission through community engagement and the vital role they play in civil defence. Civil defence is a factor in their locations and their equipment scales. For many New Zealanders, Reserves are their only physical connection with the NZDF.

## Training the Force

*If personnel and units are not prepared to fail in training they are preparing to fail on operations.*

***Training.*** Training plays a vital role in preparing the force. Training allows the force to master complex manoeuvre, build resilience, and experiment with new techniques. It follows that if personnel and units are not prepared to fail in training, they are preparing to fail on operations.

The principles of effective military training will not change, but substantial scope exists to enhance the quality of training through organisational improvement and emerging technologies. The key development priorities are:

- ***Individual training.*** As a small force, the NZ Army places significant emphasis on challenging, relevant and safe individual training. It is in large part the adaptive foundation on which all other elements of preparedness rest. However, there will be increasing demands on time, and the future individual training systems need to modularise courses, look for opportunities for concurrent training, and ruthlessly remove redundant courses and learning objectives. New ways of speeding up the amendment and adaptation of training management plans will need to be found, so that land-force training can keep up with the velocity of change. One aid to this will be the reinvigoration of land-warfare instructors as a career stream.
- ***Collective training.*** Collective training is the basis for building combined-arms and joint operational excellence. It is both an art and a science. Scientifically, exercises practice selected mission-essential tasks. Recording the number of times tasks and standards are achieved is essential to quantifying force preparedness. In the 2035 timeframe, the NZ Army must continue to improve its analysis of training objectives and standards. However, the real value of training is derived from graduated levels of training realism provided by experienced and imaginative trainers. In the 2035 timeframe, trainers will need to cleverly weave together live, virtual and constructive training methods. Operations are increasingly integrated; therefore, large exercises should practice end-to-end training (factory to foxhole) in addition to combined-arms training. Even the smaller exercises should be networked to regimental or brigade headquarters, to practice distributed operations.
- ***Training realism.*** Training cannot replicate operations, but within the bounds of safety and resources, it must simulate them as closely as possible. Not to do so means soldiers will be under-prepared for what they will face in operations. The future land force should ensure that individuals and force elements have conducted their role, task or job standard under a variety of testing and challenging conditions, before they are required to deploy. Training areas and aids need to represent operational environments as realistically as possible. To achieve the level of proficiency required, multi-role forces will need to adopt many of the training concepts and approaches currently used by SOF – including an emphasis on rehearsals, repetition and rigorous review, free-flow exercises, and creativity that interests, challenges and extends soldiers. Technology advances such as augmented reality and virtual-reality systems will also assist.

***Centres of Excellence (CoE).*** Over the 2035 timeframe, the NZ Army will continue to evolve centres of excellence. Centres of excellence are made-up of multi-disciplinary teams that collaborate, using best practice across their function or capability areas to drive results, innovation and economies of scale. The NZ Army is developing four functional centres of excellence to train, govern, guide, support and measure development of its light fighting force. These are:

- ***Profession of Arms.*** As a profession, the Army must hold itself accountable for the ethical application of lethal force on behalf of the Nation. Inculcating the profession of arms is one of the Army's most fundamental responsibilities and is vested in Army Command School and supported by The Army Depot. The Army Command School develops the Army's leaders and incorporates the Officer Cadet School, the NCO School and the Army Leadership Centre.
- ***Mission Command.*** Mission command is both a philosophy and a function. This centre of excellence will focus on command and command support, and will be vital in helping the Army make the cultural change required to achieve the benefits of digitisation. Its core functions will be technical, procedural, conceptual and developmental. It is likely that this Mission Command Training Centre will incorporate the Schools of Signals and Intelligence (technical, procedural), the Tactical School and the Wargaming Centre (conceptual), as well as the thought leaders from the Digital Test Reference and Evaluation Centre, and from the Adaptive Warfare Centre (developmental).
- ***Land Operations.*** This currently exists as the Land Operations Training Centre, but with the advent of the Mission Command Training Centre, it will be reduced in scale and focused on combat, combat support and combat service support functions.
- ***Special Operations.*** This is a small and highly efficient centre, that will be likely to take on new expertise

## Championing Excellence – the US Navy's 'Top Gun' School as a CoE

One example of a successful CoE is the US Navy's Naval Strike and Air Warfare Center (part of which is the famous 'Top Gun' school) which concentrates and centralises subject matter experts within the organisation.

Post-Vietnam, the US Navy recognised that their fighter pilot training was lacking, and formed the Naval Strike and Air Warfare Center. Unlike a standard training institution, the Centre was also responsible for developing the tactics and concepts they would be teaching. The Center empowers experts to continuously develop and enhance their combat aviation capability, sets standardisation and qualifications, and trains both individual pilots (as instructors) and collective formations up to Air Wings.

Empowered to experiment, innovate and pioneer change, the Center has fostered a culture of excellence. The concentration and empowerment of experts within the 'Top Gun' school and the wider centre has been a key component in how the US Navy's combat aviation community maintains a competitive edge, and is a powerful example of how a CoE can develop expertise and excellence within an organisation.

as the implications of hybrid warfare become apparent. The Special Operations Training Centre also has a role in migrating best practice to multi-role forces where possible.

***Educating the Force.*** Education will be a significant force multiplier in the future operating environment. The key development priorities are:

- ***Leveraging innovations in adult learning (andragogy).*** Modern and distributed learning platforms offer multiple avenues for personnel to access learning. Portal learning systems that NZ Army personnel can access through their own electronic devices will enable cost-effective education opportunities, and allow individuals the freedom to find and focus on areas of study that suit their interests and learning style.
- ***Continuous education.*** Education opportunities should be available across the force and at all stages of a service person's career, creating a culture of learning and development. Many soldiers who enter the Army have not fulfilled their academic potential at school. This holds them back from technical roles for which they might otherwise be well suited. As part of the NZ Army's aspiration to maximise the potential of all soldiers, there is a need to increase the accessibility of secondary qualifications as well as tertiary ones.
- ***Cultural education.*** Cultural education begins at home. All Army commanders must be able to acquit themselves well on the paepae (orators' bench). Beyond this, all NZ Army personnel are encouraged to develop cultural awareness and linguistic skills, particularly in Pacific languages, including Pidgin; South East Asian languages, including Bahasa; and more global languages, such as French, Spanish, Mandarin and Arabic.

***Experience.*** Along with operations; exchanges and secondments will remain a key means of building an experienced force. International exchanges, as part of an engagement strategy, have the dual value of enhancing interoperability and supporting mutual capacity building with our partners. As a small force, the NZ Army needs to use exchanges, exercises and courses with larger forces to maintain proficiency in areas that it is likely to use on coalition operations, such as projection techniques and platforms. Operational exchanges will also assist leadership development, by exposing future commanders to scale and complexity levels beyond those that can be generated in New Zealand.

## Infrastructure: Building a firm base

Training areas are to the Army what ports and airfields are to the Navy and Airforce. Training infrastructure is used to train for and mount operations. It incorporates both natural infrastructure (land) and built infrastructure (training facilities and garrison structures). Looking ahead, the Army needs to adapt its training infrastructure to leverage developments in technological training aids, Integrated Land Missions, emergent outputs, and the need for Army families to have improved stability. The Army will do this under Plan Mere.[22] By 2035, Plan Mere will have created three centres of gravity for the land force:

22 A mere is a chieftain's weapon used by Māori in close combat.

- ***Special Operations Forces.*** Papakura Camp will remain the centre of mass for SOF. Strategically, this supports SOF's counter-terrorist responsibilities by locating them close to the bulk of New Zealand's people, wealth and international movements, as well as NZDF strategic projection assets. SOF training is supported by a specialised training area at Ardmore, as well as by the International Airport and the maritime environment surrounding Auckland.
- ***Multi-role Forces.*** Linton and Burnham Camps will remain the centre of gravity for multi-role forces.
  - Combat Operations. Linton is home to the largest number of service personnel in New Zealand and while it provides for all Integrated Land Missions, it is the Army's primary warfighting base. Its key value is its scale, which allows it to generate combined-arms capability, and its proximity to Ohakea Air Base and the Waiouru Training Area. At 63,000 hectares, Waiouru serves as the national training area for air-land manoeuvre. As such, it requires the capability to prepare and rehearse forces up to Task Force size in all Integrated Land Missions, up to and including Joint Land Combat, for extended periods. Waiouru will therefore retain a small garrison to facilitate the over 13,000 military and civilian people that use the training area annually. Facilities will include a forward mounting base, a precinct that supports living and learning, and a small community, cultural and historical precinct.
  - Security Operations. Burnham plays a vital regional role in New Zealand's South Island, in youth development and support to New Zealand's Antarctic program. Burnham based units are enabled by the Tekapo Training Area, which suits company level training and procedural training, and by the expanse of the South Island. In the future, there may be potential to extend Burnham's stability and security role, to create a centre of excellence for population support, population protection and civil capacity building in New Zealand and the South West Pacific.
- ***Support Forces and Headquarters.*** Trentham supports logistic and headquarters staff that manage and sustain the organisation. The camp is shared by a range of NZDF organisations.

Key requirements for the NZ Army's future training infrastructure include:

- ***Close training areas.*** Improved garrison training facilities will support junior leaders' conduct of procedural training.
- ***Environmental Training.*** Multiple environments are required that support open and close country training, brown and green water training, air-land integration, and urban training. Thought should be given to the complexity of urban terrain, including simulating different building types, engagement angles and ranges, trafficability, and constrained communications.

- ***Range and Training Staff.*** Facilitated training will maximise the value of training and the time invested, by minimising the risk and administrative burden of organising, conducting and reconstituting training.
- ***Automation.*** Learning will be faster and achieve higher levels, because of automation that creates sophisticated scenarios, and provides real-time feedback on performance and after action review.
- ***Networking.*** Networked training facilities will allow distributed training between units and even countries. This will reduce travel expense without foregoing the value of collaboration and competition.

## Equipping the Force

Integrated Land Missions require the NZ Army, as part of the Joint force, to support expeditionary operations with modern and highly technical equipment. Deployments are likely to be distributed across extended lines of communication. To minimise the logistic burden, land forces should be conversant with austerity, seek self-sustaining solutions (power, fuel, water) and leverage external capabilities (coalition, contracting and host nation). Sustaining future operations will require focus on capability development, inventory management, contracting value, combat service support including health service support.

***Capability Challenge.*** Rommel famously stated 'the battle is fought and decided by the Quartermaster before the shooting begins.' Heeding Rommel's wisdom, the capability challenge is to equip the force for a wide array of tasks in an increasingly competitive environment, in which technology is developing at an unprecedented pace. Furthermore, it is essential to provide the right type, quantity and quality of equipment, without overburdening the soldier, the training, or the logistic systems – while remaining within the fiscal constraints of a small military.

***Soldier Systems.*** Increasing the capability of each individual soldier relative to the task and threat is a

force-multiplier strategy. Future soldier systems will need to focus on the following key areas:

- **Enhanced situational awareness,** by networking the soldier to the tactical information environment, without causing information overload.
- **Enhanced lethality,** by continuously evolving weapon systems and training methods to increase engagement ranges, accuracy and individual lethality.
- **Enhanced survivability,** providing better levels of force protection across the survivability spectrum, including armour and concealment.
- **Reduced physical loads,** to increase soldier's tactical agility, endurance and freedom of manoeuvre.

***Equipment Diversity.*** As a relatively small force, the NZ Army will continue to require small yet diverse fleets of equipment. For instance, as New Zealand's only military engineering capability, the 2nd Engineer Regiment fields bridging assets that allied forces hold at Divisional level. The same unit also provides a wide array of other military engineering skills from road building and denial through to demolitions and boating. Given the size of the NZ Army, this creates a relatively high overhead to acquire, maintain and employ the variety of equipment fleets.

***Efficiency.*** The logistics challenge of a diverse equipment fleet is to manage the complexity of multiple fleets efficiently. Every dollar unnecessarily spent on inventory management creates a direct reduction in combat power. To this end, the NZ Army will promote an 'equip the force' philosophy, which differs from the traditional paradigm of 'equip the unit'. This approach seeks to employ smart logistics management practices that maximise the utilisation of equipment fleets, thereby enabling a smaller fleet. To achieve this, equipment will be held in centralised equipment pools, other than special-to-role equipment (as determined by a unit's allocated table of equipment). For this concept to be successful, equipment must be available and reliable when required, and the booking system must be matched to operational need and intuitive to use. Streamlined urgent operational acquisition also has utility for unforeseen requirements.

***Equipment Redundancy.*** Efficiency needs to be balanced with redundancy. The demands of the military environment mean that equipment is frequently pushed to failure. Equipment can also be damaged or destroyed by enemy action, and lines of communication and resupply can be cut, meaning that equipment that was planned for is no longer available. Consequently 'just in time logistics' is only relevant where resupply can be assured. Within limits, additional capability will need to be purchased and held ready to replace damaged equipment and to enable mobilisation of reserve forces.

***Resilience.*** Block obsolescence can create strategic risk, especially in small, mission-critical fleets. Mixed-type and rolling-replacement will reduce the risks to preparedness. To further reduce risk, procurement policy should seek to leverage 'leading edge' capabilities that are proven rather than 'bleeding-edge' technology that is yet to be fully validated.

## Combat Services: Fielding the Force

Combat Service Support provides the force the physical and moral means to win. It has four functions; logistics (supply, maintenance, distribution, movements), construction engineering, health services, and enabling services (such as morale, welfare, recreation, spiritual support, safety and administration). Logistics and health services are key areas of focus for future force development.

***Logistics Challenge.*** The NZ Army combat service support has twin challenges: efficiency and combat viability.

***Efficiency.*** Combat service support in 2035 needs to be smarter, smaller, more self-sustaining, and commercially savvy. The current combat service support paradigm consumes too much time, too many people, and is too reliant on a resupply chain that is easily interdicted and disrupted. The Consolidated Logistic Project will address some of the efficiency challenges by transforming Army inventory-management and equipping philosophy. However, more innovation will be required. Force designers, logistic leaders at all levels, and capability staff will need to collaborate closely to find new ways of doing business, including:

- **Smarter.** Digitisation is a quantum leap for efficiency. Sensors, inventory tracking, smart power metering and autonomous systems all work to reduce risk, cost and error rates while improving agility and resilience. The corollary is that logistic leaders also need to ruthlessly review their processes, to exploit the digital opportunities and reduce unnecessary bureaucratic burdens that undermine combat power. A risk of not doing so is that Army logistics will fail to meet the expectations of the future workforce, and it will be increasingly hard to attract and retain the right talent.
- **Smaller.** As an aiming mark, force designers should explore options to build a combat service support capability that consumes no more than 25 percent of the NZ Army's personnel and current account. Being ambitious will help to uncover hidden opportunities. On expeditionary operations, the combat service support footprint should also be reduced wherever possible, to free resources and personnel positions for manoeuvre forces and to reduce support personnel's aggregate risk from adversary action.
- **Self-sustaining.** Innovation, miniaturisation and smart materials are creating new opportunities for sustainability and endurance. Exploiting this will help reduce reliance on the supply chain. Areas to explore include; mobile manufacturing (as three-dimensional printing and additive manufacturing technologies mature), fuel efficiency, potable water production, and tactical power generation.
- **Savvy.** Logistic leaders must have business acumen. This will enable them to support the commander with high value contracting arrangements, reduce permanent overhead costs, improve options for expeditionary contractor support, and support the NZ Army's requirement for transparent probity

when expending the Nation's resources. This line of effort needs to be cognisant of the requirements for redundancy and operational security, as well as foresight, when contracting from host nations (see page 45). Therefore, it is imperative the land force maintains individuals with contract management skills.

- **Combat Viability.** By 2035, combat service support soldiers will need to be better able to fight, move and communicate:
  - Fight. As members of a light fighting force, every logistic soldier must be able to fight. Combat service support convoys and installations need to have sufficient support weapons to ensure their viability, and soldiers need to be practiced enough to employ them effectively. The vanguard of this development is the refreshed combat driver trade. Other logistic trades will need to be similarly reviewed. After two decades of stability and counter insurgency operations, commanders will also need to revisit their tactical practices in light of growing hybrid threats.
  - Move. To support land force manoeuvre, combat service support must have commensurate mobility. The requirement for protected mobility grows as the lethality of the operating environment increases. The Land Transport and Protected Mobility Vehicle projects will address the equipment requirements; logistics commanders will need to lead the organisational and cultural changes.
  - Communicate. Distributed operations are not possible if combat service support elements cannot communicate. The Network Enabled Army programme will provide the network and systems to be used by combat service support elements. Commanders will need to ensure soldiers are trained in communications, and that new means of operation are developed to increase the speed, safety, survivability and success of combat service support operations.

***Health Services Challenge.*** Health services ensure the NZ Army is fit to fight, by building physical and mental resilience and minimising the effects of injury, disease and environmental threats on the force. In the future operating environment, they will be required to support distributed operations from multiple dispersed locations, often on the move and in the fight. Key drivers for this scenario include the advent of hybrid threats, the growing potential for proliferation of mass casualty weapons (nuclear, biological, chemical radiological), and the demands of population-centric operations. Health services will also be challenged to manage the growing cost of health provision, which is driven in part by workforce specialisation, technological advances, and advancing expectations on the minimum standards of care.

In answer to these challenges, health commanders will need to revise how they provide high-level tactical care in austere conditions, potentially without fixed infrastructure. Six focus areas are highlighted:

- **Leadership.** A more robust development model for health leaders is required. There remains a critical requirement for medical specialists, but their expertise can only be maximised if the NZ Army has health commanders well versed in health service management and the integration of health efforts into joint and partnered operations. One means to be explored is for general health management to be a career option for logistic officers, just as other CSS functions are.
- **Humanitarian operations.** As part of population support and population-protection missions, health services will be key contributors to the NZ Army's Humanitarian Task Group; in some circumstances, they may be required to lead it. Therefore, health services should look for synergies from within, that enable them to staff task unit and task-group headquarters. One option to consider is dual-skilling physical training instructors as deployed operations staff.
- **Combat operations.** As a light fighting force, the NZ Army requires a high level of combat-ready advanced first aiders, to provide tactical commanders freedom of action. The successful Special Forces model should be investigated as a means for wider adoption of advanced combat lifesavers across the force. A highly efficient evacuation system from point of injury to definitive care will be similarly important. That said, one of the lessons from the Burma campaign of World War II was that freedom of action can also be increased if soldiers are returned to action from as close to the front as possible. Therefore, health services embedded within

the land force must remain abreast of contemporary developments that reduce the impact of wounds and disease, while advancing their evacuation capacity and their own ability to operate in combat environments.

- **Smart.** Supporting distributed operations with scarce medical resources will require health services that are networked. Networking should focus on those areas that provide the greatest additive value to combat power such as; reach-back to specialists, enhanced situational awareness that allows the medical chain to self-synchronise, access to health intelligence and health and wellbeing monitoring that provides the commander indicators on the combat viability of a given force. Smart partnerships with public, private and other militaries will be a key success factor.
- **High Performance.** As discussed, NZ soldiers will need a qualitative edge to succeed and survive in future operations. Health services will provide a critical contribution, via the use of health sciences (nutrition, exercise science, a high-performance philosophy, and psychology) and medical technology (including biotechnology implants and wearable technology).
- **Resilience.** To sustain operations the force must be resilient. The challenge for health professionals, commanders, and individuals alike is to ensure the force is fighting fit – mentally as well as physically. Invariably soldiers are called to intervene in physically and morally confronting circumstances. This means that the risk of mental injury is higher for military personnel than most other professions. Advances in psychology highlight that resilience training and an integrated health model, which includes mental and spiritual support, are increasingly important foundations of a high performing force. Health leaders must also work holistically with external providers to ensure that, having served New Zealand, veterans and their families can access support.

CONCLUSION

# CHIEF OF ARMY'S DEVELOPMENT INTENT

To improve our organisational understanding and thereby operationalise the FLOC 35, a future-focused Chief of Army seminar was conducted in Waiouru in May 2016.

During the seminar, participants analysed and discussed how to achieve the FLOC 35's aspirations when contrasted against factors such as; current NZDF policy, the fiscal environment, and regional geopolitics.

As a result of the seminar, the FLOC's capability themes were further refined. Furthermore, seminar feedback highlighted some key tasks that are required to operationalise the FLOC 35. These short and mid-term objectives are listed below.

That said, the debate is not done. As we begin to operationalise the FLOC 35, new opportunities and challenges will surface and we will continue to learn. To reiterate: I expect all in the Army – regardless of rank and role – to test and debate the concepts outlined in this document.

To this end, there are a series of objectives the NZ Army will work towards in the short, medium, and long term. In addition, there is a range of questions and topics that we need to consider, evaluate and debate. The topics are included at the end of this chapter as a key questions list. The topics all relate to issues and future challenges that we will face in the future operating environment, building upon conclusions and observations arising from the FLOC. Personnel are encouraged to research, challenge and progress our understanding of these issues, including when undertaking study, on promotion courses, or in their own time. The better the research, thought and discussion that occurs around these issues now, the better New Zealand will be prepared to meet the challenges out to 2035.

Photo credit: Australian Defence Force

## SHORT-TERM OBJECTIVES (2017–20):

Clearly define accountability for tactical Command and Control training, education, and doctrine sponsorship within the NZ Army.

Initiate a NZ Army outputs review to determine the feasibility of aligning Integrated Land Missions to NZDF Outputs.

Conduct an Army Experiment to test force generation models.

Review the personnel function to reduce the proportion of time that commanders currently spend on administration, at the expense of leading their people.

Deliver key capabilities through the following critical programmes (Figure 15).

## MID-TERM OBJECTIVES (2020–25):

Deliver and rebuild training and garrison infrastructure.

Update FLOC 35 short and mid-term objectives based on the Future 35 refresh.

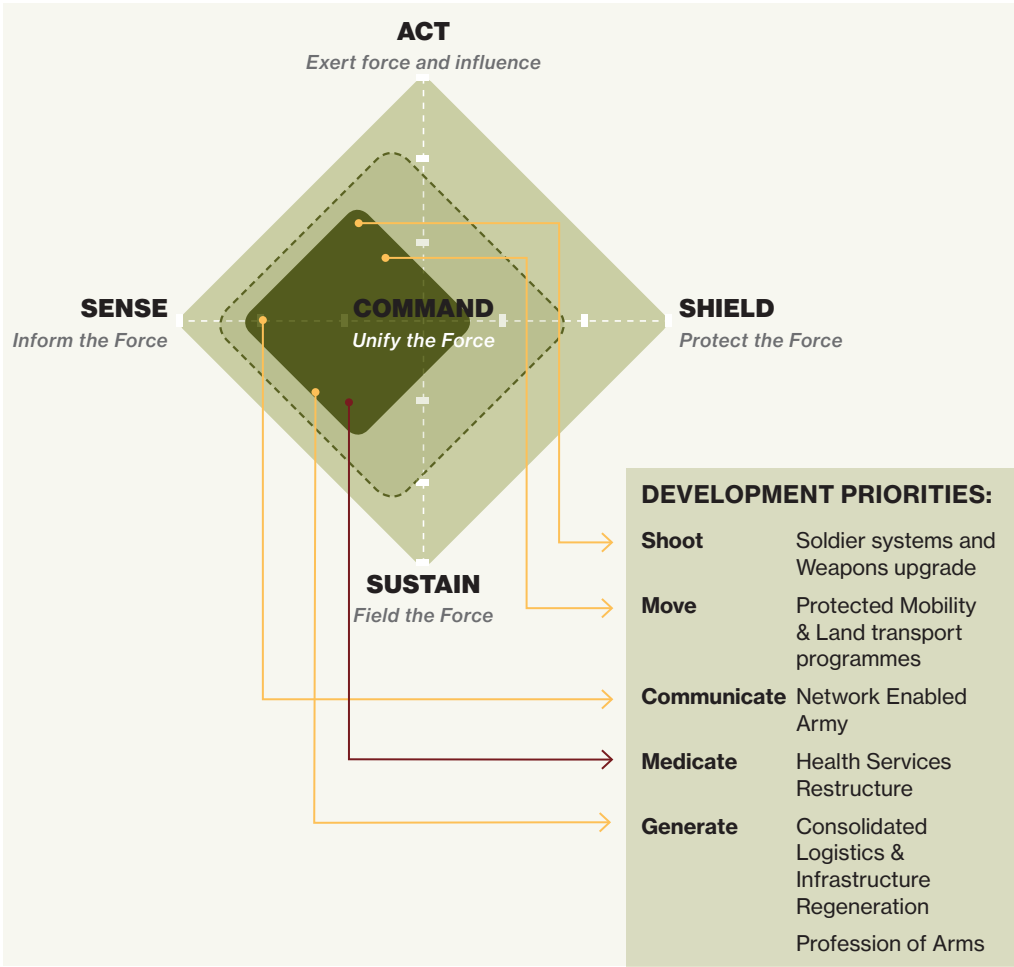



**Figure 15:** *Future Land Capabilities*

# KEY QUESTIONS LIST FOR FURTHER RESEARCH

## 1. The Future Land Operating Environment:

a. How will big data, machine autonomy, artificial intelligence, and human enhancement change military operations?

b. How will urbanisation and climate change impact on New Zealand's Joint Task Force operating model?

c. How dispersed is 'too dispersed' for future land force operations – what constraints and considerations will arise in distributed operations?

d. What are the ethical and legal considerations of employing remote and autonomous systems in military operations?

e. What has FLOC 35 not identified or incorrectly assessed in terms of the future land operating environment?

## 2. The Future Land Operating Context:

a. How can we best integrate Acceptable Enduring Conditions into military decision making, TTPs and thought processes?

b. If warfare has evolved from melee to mass and then to manoeuvre, is there another evolution coming and, if so – when and what will it be?

c. How does the concept of legitimacy apply to NZDF operations?

## 3. Integrated Land Missions

a. What are the implications of conducting Information Activity?

b. What does Capacity Building mean for force generation?

## 4. Future Land Capabilities

a. How can future deployed HQs best leverage reach-back?

b. Are there novel or innovative ways to harden and secure our networks?

c. What organisational structures does the future land force need to conduct CEMA as part of Integrated Land Missions?

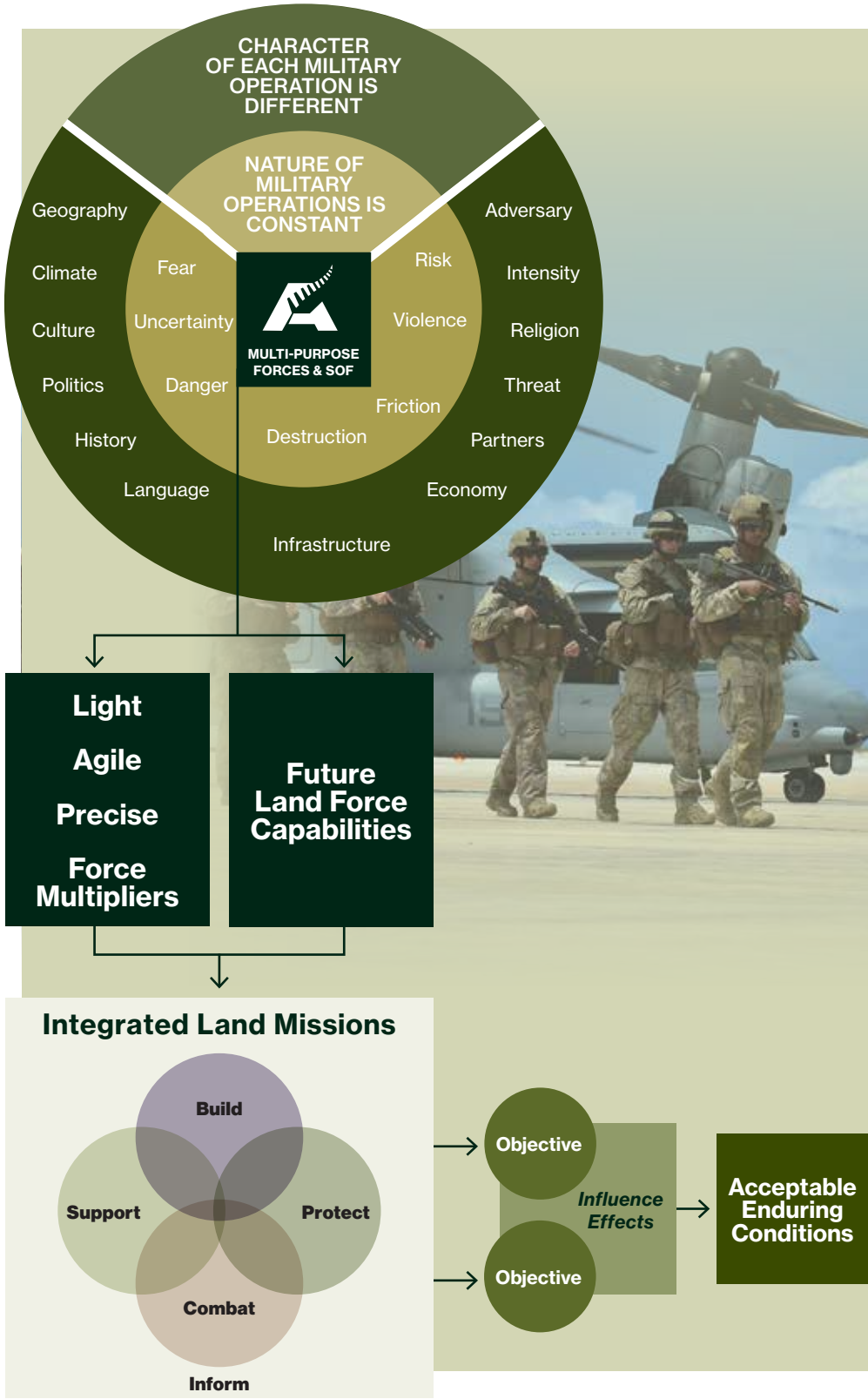
d. Does the CIMIC function best align with the Engineers, rather than the Artillery?

e. What can the land force adapt from psychology and physiology studies, to benefit decision making and leadership?

f. How can wargaming and red-teaming be employed to best effect?

g. What does changing demographics mean for future force generation?

h. How can the land force benefit from diversity in the workforce?


CHARACTER OF EACH MILITARY OPERATION IS DIFFERENT
NATURE OF MILITARY OPERATIONS IS CONSTANT
Geography
Climate
Culture
Politics
History
Language
Infrastructure
Adversary
Intensity
Religion
Threat
Partners
Economy
Risk
Violence
Friction
Destruction
Fear
Uncertainty
Danger
MULTI-PURPOSE FORCES & SOF
Light
Agile
Precise
Force Multipliers
Future Land Force Capabilities
Integrated Land Missions
Build
Support
Protect
Combat
Inform
Objective
Objective
Influence Effects
Acceptable Enduring Conditions

# ACRONYMS

| | |
|---|---|
| ABCANZ | American, British, Canadian, Australian and New Zealand Armies' Interoperability Program |
| AI | Artificial Intelligence |
| AOG | All-of-Government |
| C2 | Command and Control |
| CEMA | Cyber Electromagnetic Activities |
| CoE | Centre of Excellence |
| COP | Common Operating Picture |
| COTS | Commercial Off the Shelf |
| CSS | Combat Service Support |
| ER | Emergency Relief |
| ERR | Emergency Rehabilitation & Reconstruction |
| EW | Electronic Warfare |
| FLOC | Future Land Operating Concept |
| FPDA | Five Power Defence Arrangement |
| FVEY | 'Five Eyes' Intelligence alliance compromising Australia, Canada, New Zealand, United Kingdom and the United States |
| ISTAR | Intelligence, Surveillance, Target Acquisition and Reconnaissance |
| JIM | Joint, Interagency, Multinational |
| MFAT | Ministry of Foreign Affairs and Trade |
| MOTS | Military Off the Shelf |
| NEA | Network Enabled Army (NZ Army force digitisation and modernisation programme) |
| NGO | Non Government Organisation |
| NZ | New Zealand |
| NZAID | New Zealand Agency for International Development |
| NZDF | New Zealand Defence Force |
| OECD | Organisation for Economic Cooperation and Development |
| RNZAF | Royal New Zealand Air Force |
| RNZN | Royal New Zealand Navy |
| RPAS | Remotely Piloted Aircraft System |
| SA | Situational Awareness |
| SOF | Special Operations Forces |
| SSR | Security Sector Reform |

# GLOSSARY

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| **Acceptable Enduring Conditions** | NZDF operational term identifying and describing the desired end-state. |
| **Asymmetric threat** | The actions undertaken by a state, or by non-state parties, to circumvent or negate an opponent's strengths and capitalise on perceived weaknesses by exploiting dissimilarities – including values, strategies, organisation and capabilities. The instigator's aim is to gain an advantage, which could not be attained through conventional means, or gain an advantage more cost effectively than by conventional means. |
| **Command and Control** | The exercise of authority and direction, by a properly designated commander, over assigned and attached forces. Command and control functions are performed through an arrangement of personnel, equipment, communications, and procedures employed by a commander in planning, directing, coordinating, and controlling forces in the accomplishment of a mission. |
| **Cyber** | Domains characterised by the use of electronics and the electromagnetic spectrum to store, modify, and exchange data via networked systems and associated infrastructures. Cyber exists across the other physical domains of land, sea, air and space, and can facilitate contact between the cognitive processes and the physical domain. |
| **Distributed operations** | Distributed operations employ small, capable, tactical units that can leverage the power of joint effects and are spread across large areas; to avoid adversary strengths and gain psychological, temporal and spatial advantage through coordinated independent actions. |
| **Effect** | A term used to describe the consequence(s) of an action. |
| **Electronic warfare** | Military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy. |
| **Fires** | The use of weapon systems to create a specific lethal or less-lethal effect on a target. |
| **Five Power Defence Arrangement** | A series of defence relationships between the United Kingdom, Australia, New Zealand, Malaysia and Singapore, whereby the five countries consult each other in the event of external aggression against Malaysia or Singapore. |
| **Force Element** | Military grouping or formation of any size. |
| **Force multiplier** | Refers to a factor that dramatically increases the effectiveness of an item or group. |

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| **Force protection** | Actions taken to prevent or mitigate hostile actions against NZDF personnel, resources, platforms, and critical information. Can be defensive or offensive, and passive or active. |
| **Force structure** | Relates to the type of force required – including personnel, equipment, facilities, and military doctrine – to achieve the level of capability necessary to conduct operations effectively. |
| **Full spectrum** | The full range of levels of violence – from stable peace up to, and including, general war. |
| **Human security** | Relates to the security of individuals from the combination of threats associated with war, genocide, and the displacement of populations. At a minimum, human security means freedom from violence and fear of violence. |
| **Human terrain** | The socio-political makeup of a population – including ethnicity, culture, religion, age and gender. |
| **Influence** | The capacity or ability to have an effect on the awareness, perception, decision-making, behaviour, or actions of any party. |
| **Intensity** | The overall tempo and degree of violence employed and/or encountered. |
| **Hybrid tactics** | Any combination of conventional or irregular tactics, including information or cyber warfare tactics. |
| **Irregular activity** | Unconventional, illegal or criminal tactics or capabilities. |
| **Irregular threat** | A threat employing asymmetric capabilities (see Asymmetric threat above). |
| **Joint** | Adjective used to describe activities, operations, and organisations in which elements of at least two Services participate. |
| **Joint force** | A general term applied to a force composed of significant elements of Navy, Army, and Air Force, or two or more of these Services, operating under a single joint force commander. |
| **Land operations** | Military operations conducted by a land force. |
| **Littoral** | Coastal sea areas and that portion of land which is susceptible to influence of support from the sea. |
| **Manoeuvre Warfare** | An approach to operations in which shattering the enemy's overall cohesion and will to fight is paramount. It calls for an attitude of mind in which doing the unexpected, using initiative and seeking originality is combined with a ruthless determination to succeed. |

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| **Mission Command** | Intent and trust-based framework for command, emphasising higher intent and objectives, and allowing maximum freedom of action amongst subordinates. |
| **Multi-agency** | Involving cooperation between several organisations. |
| **Less-lethal** | Effects explicitly designed and primarily employed to incapacitate targeted personnel or material while minimising fatalities, permanent injury to personnel and undesired damage to property in the target area or environment. Effects on personnel and material are intended to be reversible. |
| **Precision Manoeuvre** | Manoeuvre Warfare enhanced by improved information linkages and systems, to more precisely apply combat power at decisive points and times. |
| **Riverine** | Any area situated near a river or riverbank. |
| **Security Sector Reform** | A concept that refers to a process to reform or rebuild a state's security sector. |
| **Special Forces** | Special Forces are combat forces selected and trained to special levels for the conduct of strategic, and when required, operational (and tactical)-level operations. |
| **Special Operations** | Special operations are focused, often discreet, operations of an unorthodox and frequently high-risk nature, undertaken to achieve significant political or military objectives that are outside the current capability of conventional forces. |
| **Special Operations Forces** | Special Operations Forces are selected military personnel who are organised, equipped, and trained to command, plan, conduct, and support special operations. |
| **Task Element** | A task organisation composed of a component of a Task Unit, organised by the commander of a Task Unit or higher authority, and employed to address a specific operational requirement. The level of command depends on the Task Element's complexity and the task requirements. Typically, a junior officer or non-commissioned officer commands a Task Element. |
| **Task Force** | A task organisation composed of a command and control element; one or more Task Groups and support elements as required. Typically, a Task Force is commanded by a Colonel or higher. |
| **Task Group** | A task organisation composed of a deployable command post or headquarters; one or more Task Units and support elements as required. Typically, a Task Group is commanded by a Lieutenant Colonel. |
| **Task Organisation** | A unit or formation that is combined or grouped under a command element for a specific mission or function. |

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| **Task Unit** | A task organisation composed of a deployable command post; at least one Task Element and support elements as required. A Task Unit may operate independently or as part of a larger Task Group, and is the lowest level that can generate concurrent effects (when it has more than one Task Element). Typically, a Task Unit is commanded by a Major. |
| **Theatre** | A designated geographic area for which an operational-level joint or combined commander is appointed and in which a campaign or series of major operations is conducted. |
| **The Integrated Approach** | An approach primarily driven by the process of people from different institutions and different disciplines working side by side at several levels to ensure that their perspectives and activities reinforce each other. The Integrated Approach requires low-level cooperation and mid-level coordination, supplemented by high-level alignment of overall strategic objectives. Integration should improve the flow of information, contribute to a shared understanding of stabilisation challenges and responses, reduce policy and delivery 'silos', and ensure greater effect on the ground.<br>Source: UK Stabilisation Unit |

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