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Te Ope Kātua O Aotearoa



**A FORCE FOR  
NEW ZEALAND**

New Zealand Defence Doctrine Publication

**DEFENCE  
LOGISTICS**  
**NZDDP-4.0**  
**(SECOND EDITION)**

# DEFENCE LOGISTICS (NZDDP – 4.0) (SECOND EDITION)

New Zealand Defence Force Publication *Defence Logistics* (NZDDP–4.0) (2<sup>nd</sup> Edition) is issued for use by the New Zealand Defence Force and is effective forthwith for guidance in defence doctrine.



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# PREFACE

## Scope

New Zealand Defence Doctrine Publication *Defence Logistics* (2<sup>nd</sup> Edition) (NZDDP–4.0) is the keystone Defence logistics publication. Responsibility for logistics in NZDF is dispersed through a range of organisations within the New Zealand Defence Force (NZDF). Hence the purpose of this publication is to provide logisticians and those whom they support the significance, interdependence, and influence logistics will have on the outcome of operations and campaigns.

Military operations are executed in increasingly complex environments against a backdrop of a fluid global security situation with a range of state and non-state actors participating. The support demands of deployed forces are increasing as technology pervades the battlespace.

In a globalised world, and consistent with a comprehensive approach to operations, contemporary logistics involves a range of networks that extend beyond the NZDF to include allies, coalition partners, host nations and commercial entities.

Logistics provides essential and in many cases critical support to manoeuvre forces. The provision of logistics support (including products and services) may be the main operational effort of the NZDF mission. Much of what is involved in providing logistic support to operations occurs behind the scenes and the complexity of logistics is often not discernible or understood by those receiving support.

## Purpose

The aim of NZDDP–4.0 (2<sup>nd</sup> Edition) is to set forth the doctrine applicable to logistic activities and performance throughout the New Zealand Defence Force.

## Application

NZDDP–4.0 (2<sup>nd</sup> Edition) provides the authoritative basis for development of logistics doctrine, education, training, equipment, procedures and organisations. NZDDP–4.0 (2<sup>nd</sup> Edition) does not specify procedures or techniques; rather it offers broad guidance which requires judgement in application.

## Structure

NZDDP–4.0 (2<sup>nd</sup> Edition) has seven parts.

- Chapter 1 – *The Nature of Logistics.*
- Chapter 2 – *Contemporary Logistics.*
- Chapter 3 – *Military Strategy and Logistics.*
- Chapter 4 – *Logistics Command, Management, and Governance.*
- Chapter 5 – *The Logistics System.*
- Chapter 6 – *Logistic Support to Capability.*
- Chapter 7 – *Logistic Support to Campaigns and Operations.*

## ACKNOWLEDGEMENTS

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- NZDDP – D *New Zealand Defence Doctrine* (4<sup>th</sup> Edition), 2017, Headquarters New Zealand Defence Force, Wellington, New Zealand.
- NZDDP – 00.1 *Command and Control* (2<sup>nd</sup> Edition), 2016, Headquarters New Zealand Defence Force, Wellington, New Zealand.
- NZDDP – 1.0 *Personnel* (2<sup>nd</sup> Edition), 2013, Headquarters New Zealand Defence Force, Wellington, New Zealand.
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- NZDDP – 4.0 *Defence Logistics* (1<sup>st</sup> Edition), 2013, Headquarters New Zealand Defence Force, Wellington, New Zealand.
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## EXECUTIVE SUMMARY

### Chapter One: The Nature of Logistics

Logistics is a New Zealand Defence Force (NZDF) capability that involves the science of planning and carrying out movement and maintenance of military forces. Logistics deals with design, development, distribution, and disposal of material. It involves the transport of personnel, the acquisition of services and facilities, and the use of medical health service support.

A study of logistics allows six principles to be identified that underpin the logistic support needed by a deployed force. The principles are: foresight, co-operation, economy, simplicity, flexibility, and sustainability.

Understanding the evolution of logistics provides insights into the challenges and opportunities that need to be mastered in providing today's logistic needs. To anticipate future logistic requirements foresight and intuition must be applied to the mechanics of logistic planning; making logistics as much of an art as it is a science.

Contemporary logistics requires physical systems, command and control arrangements, information networks, and people to be considered across the three battlefield environments of the strategic, operational and tactical. Whilst logistics underpins modern societies it is made more complex when it is expected to operate on the battlefield where the system and its people are subject to violence and environmental threats.

### Chapter Two: Contemporary Logistics

Adaption and innovation are key elements that need to characterise contemporary NZDF logistics to enable it to operate worldwide.

To execute a coordinated diplomatic military and civilian response NZDF logistics embraces a comprehensive approach which recognises that an enduring operational outcome will involve collaboration between international governments and military forces, organisations, and non-government organisations.

The combined effects of globalisation, rapid technology change, new commercial realities and a range of other contemporary influences are forcing NZDF logistics to continually evolve. Logistics frequently shapes the designs of campaigns, battles, and engagements. Because of their importance to military effectiveness, logistic forces are often critical vulnerabilities.

Future influences on logistics will involve changes in the characteristics of the future operational environment. The key characteristics of future logistics are expected to be agility; robustness; precision; networked; interoperability; deployability; contracted. Future logistics systems will be joint in nature and achieve comprehensive integration of control, information, and physical domains within the system.

### Chapter Three: Military Strategy and Logistics

Logistics is a significant component of national power and an important national strategic consideration. NZDF logistics provides an important interface with national and international logistics. National power depends on a combination of various elements and on New Zealand's ability to mobilise and integrate these elements within a coherent national strategy to support its national security interests. The application of national power and national policy objectives achieved through the coherent and effective application of all three instruments of national power: diplomatic, economic, and military.

National security relies upon the efforts of largely independent national components (diplomatic, information, economic, and military) to contribute to an all of government response to national security crises. NZDF logistics has a central role to play in supporting Defence to achieve military strategic outcomes.

Logistics is both a key facilitator and a constraint on successful management of warning time. Strategic warning time is considered in two contexts – capability warning time and crises warning time.

Sustainability refers to the ability of the force to maintain the necessary levels of combat power

for the period necessary to achieve its objectives. Sustainability concerns every phase of an operation, from generation, mounting, deployment, and sustainment to redeployment and reconstitution. It is dependent on the ability of the operational supply chain to deliver the right item, to the right place, at the right time, in the right quantity, and in spite of adversaries' disruptive actions.

## **Chapter Four: Logistics Command, Management, and Governance**

Logistics command, management and governance is complex and cannot be simply cast within a template. Logistics, as an entity, is a combination of diverse organisations within the NZDF. Whilst Commander Logistics (COMLOG) is responsible for the delivery of the logistics effect in support of NZDF outputs, the single Services retain the responsibility to raise and train logistics personnel to meet their and the joint operational requirements and there are few formed joint logistic units at the operational or tactical levels to provide a consistent command structure.

## **Chapter Five: The Logistics System**

NZDF logistics is a multidimensional intricate entity which incorporates a number of organisations and functions found throughout NZDF that work towards a shared goal. NZDF logistics can be viewed from two complementary perspectives: as a system of systems and a combination of networks. Viewing logistics as a system of systems and as a series of networks, aids understanding of how the systems functions and how it might be developed and improved. The performance of the logistics system is dependent on the professional mastery of logisticians

## **Chapter Six: Logistic Support to Capability**

NZDF logistics must provide the NZDF with logistic support capabilities that enable the NZDF to defend New Zealand and its interests. Capability management aims to balance current capability requirements with capability development. Logistics is an integral element of the capability life cycle. The logistics capability

can be comprehensively described in terms of the fundamental inputs to capability.

Logisticians at every level of command are responsible for providing advice on logistics preparedness and sustainability, and the impact of logistics preparedness on the overall preparedness of forces. NZDF logistics capability provides a construct to understand and manage the component parts of capability, without unduly focusing on equipment and systems.

## **Chapter Seven: Logistic Support to Campaigns and Operations**

Logistics plans are built upon critical information about the logistic characteristics of the operational theatre. Logistics support to operations is responsive, flexible, balanced, and survivable. Logistic planning is an integral element of joint military planning processes at the strategic, operational, and tactical levels. Campaigns and operations planning take place at different levels under varying circumstances. Logistic considerations are fundamental to any planning effort.

Logistic support to the conduct of campaign and operations involves a logistics system that covers campaign and operations at the strategic and operational level. Logistics support to campaigns and operations is needed across all phases of a campaign or operation, including preparation, deployment, sustainment, redeployment, and reconstitution. These phases are initiated sequentially and may continue concurrently until the operation ceases. Logistics planning will consider all phases of a campaign or operation during the initial planning cycle, and continue to refine the logistics plan as the operation progresses. The end of a campaign or operation can be complex and involve simultaneous activities. Careful detailed planning by commanders and their logistics staff ensures coordination with the overall campaign will ensure success.



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CHAPTER 1:

# THE NATURE OF LOGISTICS





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## Introduction

### Background

1.01 Logistics is fundamental to military capability. New Zealand Defence Doctrine Publication (NZDDP) 4.0. *Defence Logistics* (2<sup>nd</sup> Edition) is the principal logistics doctrine publication for New Zealand Defence Force (NZDF) and addresses the fundamentals of logistics. It provides the intellectual basis for all other logistic publications in NZDF and spans the two logistics support dimensions: support to capability and support to operations. This publication is applicable across the span of NZDF logistics and highlights the interrelationship between all NZDF logisticians, and the significance of logistics in achieving NZDF outcomes.

### Historical Background

1.02 The word 'logistics' is derived from the Greek adjective *logistikos* meaning 'skilled in calculating.' The first administrative use of the word was in Roman and Byzantine times when there was a military administrative official with the title *Logista*. At that time, the word implied a skill involved in mathematical

computations. The first use of the term in a military context was by the Swiss writer Antoine-Henri Jomini, who in 1838 devised a theory of war based on strategy, ground tactics, and logistics.

1.03 Logistics as a military activity is as old as organised warfare, and like war has evolved considerably over time. Developments such as the introduction of new methods of transportation, new ways of obtaining supplies and new weapon systems have directly influenced logistics over time. The history of logistics indicates that logistics will continue to evolve in the future in response to technological changes and new ways of solving logistics challenges, and provides some insight into logistics of the future.

### Pre-Modern Logistics

1.04 Most pre-modern forces had relatively simple logistic needs. Warriors usually provided their own weapons and means of mobility. The primary logistic concern of pre-modern forces was feeding armies and this was done by foraging or local procurement. With the emergence of professional armies in the 17<sup>th</sup> and 18<sup>th</sup> centuries came the initial development of organised logistic systems and services. The

### Real-Life Example: A Model Army

Successful commanders and armies have always paid careful attention to logistics. The Roman Army gave us the model for the organisation of more modern land forces through the centuries, even to this day, and their example also applies in the field of logistics. The Romans recognised that in spite of their superb discipline and relatively simple needs it was unsustainable to live off the land for long as they advanced on operations. Recognising the need for compact, long lasting foodstuffs, Roman soldiers were issued with hard biscuits made from ground corn called *Buccellati*. Stockpiles of the all-important grain were held in granaries at main supply bases and fortresses and each legionary carried three days' supply while on the march. The baggage trains also carried the ten man tents used by Roman soldiers, stocks of missiles for the light infantry (archers and slingers), missiles for heavy artillery, and engineering stores such as shovels and building materials. Thus, in the Roman baggage train we see the essential elements of most subsequent logistic tails: food, ammunition, and specialist equipment. Combined with their practice of constructing a network of roads and stores depots across their empire and by making good use of the sea and inland waterways to ease the strategic logistic burden, they effectively supplied the needs of remote garrisons and field armies and foreshadowed the successful policies and practices of later military forces.



Figure 1-1: The use of railways to transport supplies during the Franco-Prussian war transformed logistics.

introduction of cannon and firearms created new supply and transport requirements. Armies became larger and less manoeuvrable, and the relatively static nature of warfare meant that foraging alone was no longer able to feed the soldiers. This led to the creation of a logistics system consisting of fixed supply points called magazines and large supply trains which were usually operated on a commercial basis. Logistics emerged as a key constraint and a key vulnerability.

1.05 Napoleon and other commanders of his era broke this nexus and regained the mobility of operations. They did this through returning to foraging and looting as a means of supporting a faster moving, lighter but larger army. However this was Napoleon's undoing in his Spanish and Russian campaigns when sufficient local supplies were unobtainable.

## Industrial Age Logistics

1.06 The industrial revolution of the late 18<sup>th</sup> and early 19<sup>th</sup> centuries radically changed the conduct of warfare and logistics. One of the major changes was the scale of warfare possible. Weapons, ammunition, machinery, uniforms, equipment, and even foodstuffs could be produced on a much greater scale. In addition, mechanisation of production significantly reduced the labour requirement, freeing up manpower for service in mass conscript militaries. A second major change brought about by the industrial revolution was the increase in lethality of new weaponry. Finally, developments in transport modes such as railroads and steamships and later aeroplanes and automobiles significantly enhanced the mobility of forces and their logistic systems. Warfare was now conducted on a national scale, involving national



## Real- Life Example: Logistics and the Campaigns for Burma

The campaigns for Burma in the Second World War illustrate how logistical factors determine whether or not a warring state will be able to bring its material advantages into play.

In 1941, the Japanese launched general offensives in both Southeast Asia and the Pacific. Japan's leaders planned their offensives of 1941 with three purposes in mind. One, the Japanese intended to secure their own sources of fuel and lubricants by seizing the oil reserves of the Dutch East Indies. Two, they intended to secure the sea lanes which connected their new acquisitions to the Japanese home islands by capturing strategic positions between the Indies and Japan, such as Malaya and the Philippines. And finally, the Japanese wished to prevent any American fleet, and hence the United States, interfering with their conquests.

To the Japanese, the main significance of Burma was its position as a bridge between the Far East and India. Both the Allies and their Japanese enemies faced extreme logistical hardships in the campaigns for Burma in the Second World War. However, due to the large-scale use of aerial transportation, the Allied commanders were able to fight in their chosen manner. The Allied advantage lay in having greater quantities of useful resources and the flexibility to deploy these resources in a more effectively.

Burma was a secondary theatre of war for the Allies so one of the most crucial objectives for the commanders fighting there was to defeat their enemies without the need for massive reinforcement. In fact, without increased logistical capabilities, such reinforcement would have not have solved the problems of the British force even it had been available. The fact that the Allied commanders could move large units by air allowed them to use their limited forces to maximum effect. The aerial transfer of troops from Arakan to Imphal in 1944 demonstrates the connection between logistical technology and the principle of war known as the economy of force.

Japanese commanders took advantage of the vulnerability of the Allied lines of communication to drive back British forces early in the war. The British then found themselves in a position where, due largely to their poor lines of communication, they were unable to launch any kind of operations except for weak advances along predictable routes under their unfavourable tactical conditions. Through the use of aerial supply, the Allies were able to break out of this pattern and attack Japanese forces at times and places which would otherwise have been impossible. Later, at Kohima and Imphal, Allied commanders were able to redeploy large forces by air and to reduce their dependence on overland supply routes on at least a temporary basis.

Throughout the campaign, logistics was not only the factor which sustained Allied forces in the field, it was the factor which determined the range of options which the commanders of those units had available to them.

mobilisation, professional national militaries, and national logistic systems.

1.07 The industrial revolution transformed logistics from being a secondary consideration of warfare to an essential pre-requisite for the conduct of war. Mass militaries consumed vast quantities of food,

ammunition, and other supplies. Modern weapons and equipment created the need for new services such as maintenance and salvage as well as for new commodities like fuel and spare parts. The management of rail and shipping networks became crucial to delivering forces to the battlefield and sustaining them. Good supply lines became critical for the projection of land and sea power. The introduction

of air power provided new logistic capabilities along with new maintenance challenges. Logistic considerations became predominant at the strategic and operational levels of war. The ability of a nation to translate industrial capability into military resources and its capacity to sustain the military effort became crucial factors in determining its capacity to wage war.

## World War II

1.08 The significance of logistics as a component of national power was clearly evident during World War II. For example, the Japanese attack on Pearl Harbour was precipitated by the perceived threat to Japan's access to industrial resources. In addition, the Allied grand strategy of 'Europe First' was based in large part on the initial inability of the logistic system to support simultaneous offensives in the European and Asian theatres.

1.09 The Allies used their industrial and transport capacity combined with more sophisticated, quantitative techniques for forecasting and programming to establish logistic superiority which in turn enabled them to defeat the Germans. Despite the critical influence it had on the achievement of victory, the Allied logistic system of World War II remained relatively cumbersome and was stretched to its limits in supporting the war effort.

## The Information Age and Globalisation

1.10 The next major step in the evolution of logistics is emerging. The information age and the advent of globalisation are having significant effects on all aspects of warfare including logistics. Many of these effects will have an influence on logistics.

- The development of more capable weapons and equipment should continue to reduce the requirement for mass forces, which in turn should result in a reduction in the volume of logistic support needed.
- Modern electronics and information systems are making possible major advances in both

equipment design and maintenance management. Sustainability is now considered a critical factor in the development and procurement of new weapons systems. This should lead to a reduction in the logistic support burden but an increase in its complexity.

- An additional complexity is assurance of the supply chain and the ability of it to meet demands when it is vulnerable to adversaries via cyber and other economic 'denial' attacks. Modern day logistics reliance on electronics and information systems is further complicated by the advent of malicious software, known as malware, and spyware being deployed by potential adversaries in both peace and war. For instance, Trojan viruses can potentially be dormant in a critical system until woken by a command to attain an unexpected effect. Security of the supply chain is a key consideration and must deliberately planned and supported, including during initial acquisition of a capability/store.
- Improvements in information processing and communications are already permitting improved management of resources. By leveraging off these advances, improved information management should lead to greater responsiveness and efficiency by optimising logistic support requirements to suit the particular needs of each operation.
- The globalisation of businesses and economies has unavoidably cast national logistics into a global context. Nations are becoming increasingly interdependent for resources and commodities and also dependent on multinational corporations for logistics. Globalisation is increasing national logistic capabilities and risks.

## Contemporary Logistics

### Logistics Terminology

1.11 NZDDP – 4.0 *Defence Logistics* (2<sup>nd</sup> Edition) describes the application of logistics across the NZDF. Although single Services may use individual terminology this document should be seen as

## Real- Life Example: Logistics during the Cold War

For forty years the main threat to North Atlantic Treaty Organisation (NATO) territorial integrity was the armed forces of the Soviet Union and Warsaw Treaty Organisation, known as the Warsaw Pact. This organisation came into being in 1955 and was a response to the rearming of West Germany and its incorporation into NATO. The treaty reinforced a number of bilateral mutual aid treaties between the USSR and its allies.

In both the Soviet Union and the West, commanders recognised that logistics was integral to military affairs. Logistics was a key area of vulnerability for both NATO and the Warsaw Pact. Soviet commanders intended to attack Western supply dumps and communications infrastructure as part of a programme that would collapse NATO's forces.

Both the Soviets and their Western counterparts focused on supplies and communications because they were the underpinnings of all the other things which armed forces do. Supplies were the means and the ends in many campaigns: the resources which made it possible for operations to take place were also the target of those operations. Both sides wanted to disrupt each other's support systems.

Logistics was the crucial factor in the war between NATO and the Warsaw Pact because of its role in supporting other factors. The most deep-rooted military problems of NATO and the Warsaw Pact manifested themselves in the opposing alliances logistical establishments. The Soviet Union lacked the technological sophistication of the West. Eastern bloc countries were unable to equip the bulk of their forces with the same capacity of advanced equipment as their Western opponents. Hence the Warsaw Pact came to rely upon a strategy of mass. The West, for their part, had no desire to live in a state of perpetual mobilisation.

Victory would have gone to the side which managed to strike more surely, sidestep its opponent's attacks with more agility and manage such partial unknowns as the military and political effects of nuclear weapons most effectively. In the 1980s, military thinkers in both alliances began to recognise shortcomings in their armed forces, both logistical and otherwise. For both sides, reform meant a firming up of what already existed. The Eastern bloc placed greater emphasis on shock, speed, and surprise. Western countries, particularly the US, added bulk to their forces and developed doctrinal concepts designed to raise the value of their technological advance to a new level.

The interplay between NATO and Warsaw Pact concepts of strategy illustrates the fact that logistical factors determine the type of war which an army can fight, and therefore the range of strategic options its leaders can pursue. One of the key lessons of the Cold War is that leaders on both sides saw logistics as a key element in their plans to defeat their enemies.

*From Case Studies in Defence Procurement and Logistics: Volume 1: From WWII to the Post Cold-War World*



Figure 1-2: An important element of logistics is the storage, transport, and distribution of any necessary material.

authoritative and overarching. This publication is primarily concerned with logistics as it applies across NZDF. In this context logistics is considered in its broadest context as it applies to the NZDF. It should be noted that the application of various logistics terms may vary from one Service to the next.

1.12 The NZDF definition of logistics is as follows.

- Logistics is the science of planning and carrying out the movement and sustainment of military forces. In its most comprehensive sense, logistics comprises those aspects of military operations which deal with:
  - design and development, acquisition, storage, transport, distribution, maintenance, evacuation, and disposal of material
  - transport of personnel

- acquisition or construction, maintenance, operation, and disposal of facilities
- acquisition or furnishing of services
- health service support (HSS).

1.13 From an NZDF perspective, while the acquisition or construction, maintenance, operation, and disposal of facilities, and the provision of HSS are incorporated within the definition of logistics, the delivery of these functions are undertaken separately and within their own doctrinal framework.

## Defence Logistics

1.14 Defence logistics incorporates all logistics functions within the capability and operational support dimension. Defence logistics is large and complex and

should be perceived as:

- a system of systems
- logistic systems domains, including the control, information, and physical domains
- logistic functions
- the capability and operations support dimensions
- the levels of command.

## Logistics Lines of Support

1.15 There are four lines of support.

- **First Line.** Support capabilities that are organic or allocated to a ship, unit, or squadron
- **Second Line.** Support capabilities that are organic or allocated to a formation
- **Third Line.** Support capabilities provided to a military force at the operational level or at installations established along the strategic line of communication (LOC)
- **Fourth Line.** Support capabilities provided by strategic-level resources such as national depots and contractors and industry.

1.16 **Relationship between Levels of Operation and Lines of Support.** There is a close correlation between levels of operation and lines of support. While the former describes the level at which the support effort is managed, the latter indicates where support assets are grouped within the military command structure. Consequently, units conducting operational-level logistic tasks will also hold first line stocks for their own sustainment and possibly for their parent formation. This relationship is depicted at Figure 1-3.

1.17 **Component Support.** While NZDF logistic doctrine embraces the joint/multinational approach, each component, due to the nature of their missions, has a slightly different approach to implementing multinational logistic options. Whilst the specific methods of supporting deployed units vary, their support requirements are very similar. Support elements must be flexible, mobile, and responsive to the requirements of the component commander. Where efficiencies can be gained, the joint approach should be maintained down to the lowest level practicable. An overview of component support is provided below.

1.18 **Maritime.** Support to a deployed multinational maritime force has two elements: shore support and afloat support. Afloat support is the responsibility

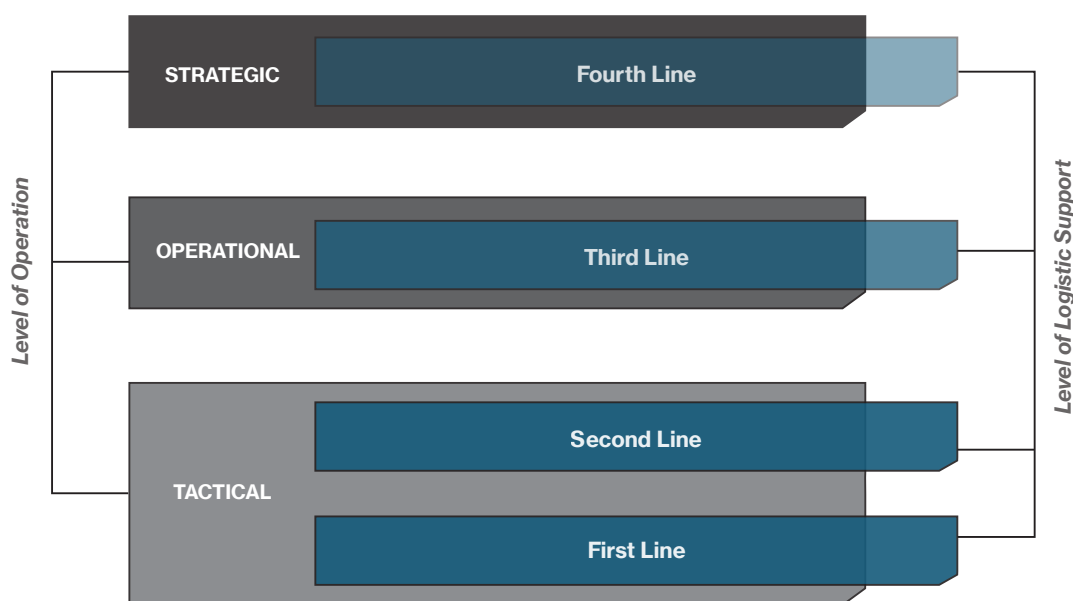


Figure 1-3: Levels of Operations and Lines of Support.

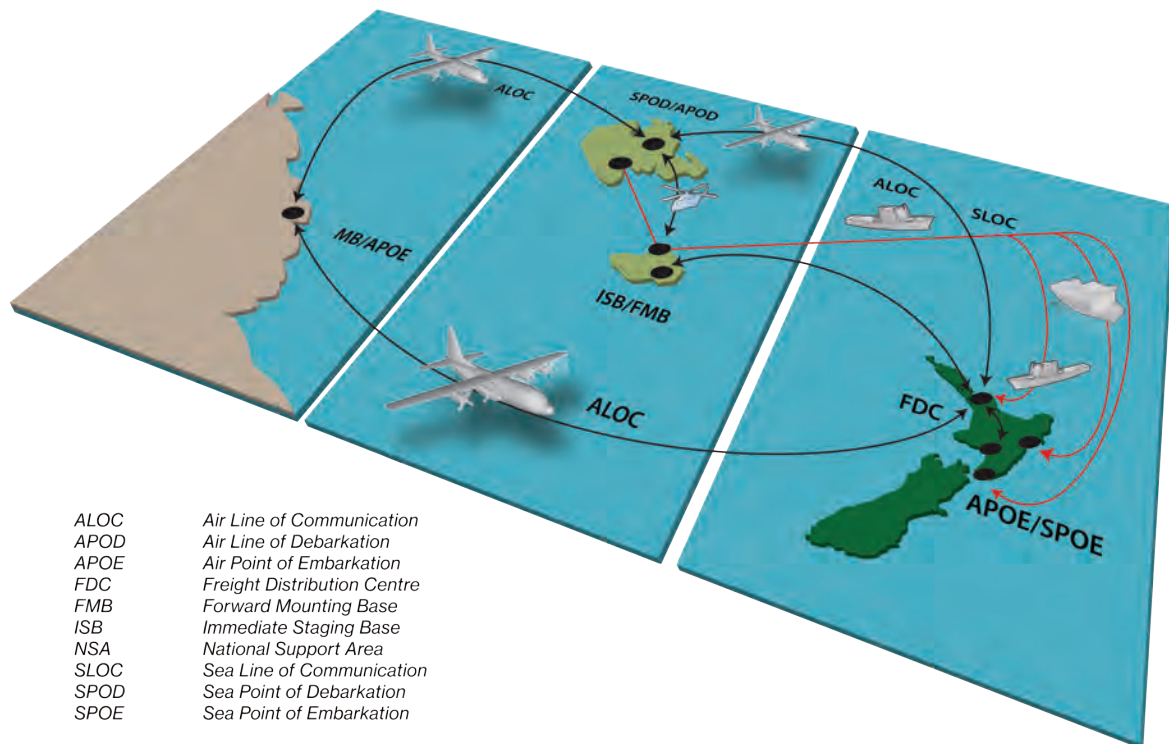


Figure 1-4: The New Zealand Defence Force logistics geographic environment.

of the commander at sea who controls all assigned logistic assets in the force afloat. Shore support encompasses the land-based logistic activities in direct support of a multinational maritime force. The main principle of the maritime logistic shore support concept is to provide shore-centralised distribution and support sites to support the units at sea. To ensure the appropriate focus, the shore support organisation must be responsive to the requirements of the commander.

1.19 **Land.** Support to a deployed multinational land force requires a clear understanding among contributing nations that national logistic organisations exist in a multinational framework in support of combined operations. Logistic support to a multinational land force on the modern battlefield, across the entire spectrum of conflict, requires flexibility and mobility. The land component support concept is designed to provide the required level of support to both national and multinational forces. It takes into account different national support structures and the composition of multinational logistic

support. Logistic support will be based on national provision and elements of multinational support as agreed by contributing nations.

1.20 **Air.** Air logistic support must be adequately tailored to satisfy operational requirements and must remain effective under all adverse conditions. The weapons systems used by air forces are technically complex, and place greater burdens on land based handling and service/repair facilities. Additionally, the nature of operations is changing to include operations out of remote and often bare bases and facilities. Air logistics is underpinned by a number of principles, which aim to optimise logistic processes in order to maintain the tempo of air operations.

1.21 **Joint Support.** Joint support coordinates and manages deployed logistics functions that are common across more than one environment or Service so as to ensure that resources required are optimised. Where possible joint support seek to deliver more for the same or the same for less when compared to

uncoordinated single Service options. Joint support requirements are task organised, scalable, and flexible, and links the deployed environmental supporting elements to the national support area.

1.22 **Special Operations.** Due to the scale, tempo, and nature of its requirements, the special operations component (SOC) is generally sustained through separate networks. However, SOC is increasingly dependent on logistic support from conventional forces. Consequently, the joint task force headquarters (JTFHQ) should plan to meet SOC requirements and be prepared to facilitate SOC non-standard sustainment and provide operational-level support. SOC logistics are addressed in NZDDP-3.12 *New Zealand Special Operations*.

## The Logistics Environment

1.23 The contemporary logistics environment includes physical systems, command and control arrangements, information networks, procedures, and people. In geographic terms the contemporary logistics environment includes all headquarters, force elements, support, and enabling agencies involved in producing logistic capability and operational outputs. The defence logistics environment encompasses the strategic, operational and tactical levels of command and management. It includes all logistic activity that occurs in the national support area (NSA) and nodes and lines of communication extending from the NSA into and throughout a joint force area of operations (JFAO). The geographic position and relationship between the NSA, nodes, lines of communication, and JFAOs vary from one operation to the next.

## Characteristics of Logistics

1.24 Any definition of logistics will invariably fail to give a complete picture of what logistics is, and what is required for logistics to be effective. Whilst the outcomes required of the logistics effort have been discussed, it is also important to understand the characteristics of logistics.

## Logistics as an Art and a Science

1.25 Logistics can be thought of as both an art and a science. Of all the major functions that affect the outcome of war, logistics is the most measurable. Logistics has therefore been one of the few aspects of war that has been consistently described as a science. This means that logistics benefits from a body of facts, relationships, and rules that can form the basis for calculation, deduction, and prediction (within the limits set by the essentially chaotic nature of war).

1.26 As with anything related to war, the obstacles that must be overcome to move and sustain forces (time, distance and terrain) are generally passive (climate and threat being the main exceptions), but the relationship between inputs and outcomes is far more regular in logistics than the other functions of war.

1.27 Because much of logistics is a science it must be thoroughly understood before it is applied. Logisticians must think each problem through, understanding the major assumptions that underlie the calculations and the implications of any change to those assumptions. Practitioners must understand the various elements of logistics and the relationships between them.

1.28 As in all other aspects of war, it is crucial to develop a vision of what needs to be done and how to do it for logistics. In addition to technical skill, development of that vision requires creativity, insight and the ability to manage risk. Mechanical and inflexible application of procedures and formulas can lead to paralysis and failure.

1.29 Logistics must therefore supplement analysis and calculation with foresight and intuition in order to anticipate future requirements. Creativity, boldness, and a willingness to innovate or improvise when required are necessary to exercise the art of logistics.

## Logistics Relationships

1.30 In logistics, as with any other aspect of the art of war, 'the essential thing is action.' Logistics can only be translated into effective action if a large number of people do the right thing at the right time. Some of the actions that make up logistics are routine, and are thus governed by rules and procedures. Other actions are ad hoc and are taken in response to particular situations. The thing that unites the actions is their relationship to the definitive task of supporting military forces and capabilities.

1.31 The actions that comprise logistics are all small steps in a long interrelated and highly complex chain of activity. Originating in the civilian economy, resources pass through the various echelons of command and control, connected by a network of logistics systems and processes. The intricacy of these relationships is not easily described by narrative, model, or flowchart, but an understanding of logistics requires a good sense of the nature of these relationships and demands effective contingency planning should any part of the system be deliberately targeted by an adversary to deny mission essential support or equipment.

1.32 The classic technique for making sense of these relationships is to reduce them into abstractions such as lines of communication, levels, or echelons of support. These abstractions are useful because they provide a shorthand that captures one or more features of a relationship (for example, scale or geographic location) but can also be dangerous as they mask the inherent complexity of logistics relationships and make them seem more straightforward than they are.

## Logistics Organisation

1.33 Because of its inherent complexity, logistics requires the sustained, creative, and systematic cooperation of large numbers of people. Such cooperation can only be achieved by well-considered and tailored organisational arrangements. The best organisation is an adaptable one that meets the peace

time requirements of preparing for war and operations but is structured for war and can easily transition.

While the various activities of logistics will be carried out by a number of different organisations internal and external to NZDF, these organisations must be viewed in totality for the effectiveness of the logistics system as a whole.

## Logistics as a Complex System

1.34 The NZDF is a complex system. A complex system is composed of multiple parts, each one of which must act individually according to its own circumstances and which, by so acting, changes the circumstances affecting all other parts. The NZDF is constantly evolving, changing its size, composition, organisation, and capabilities in response to the environment in which it operates. The logistics organisations evolve as part of this and to be effective they must function as a complex system operating within the NZDF. The most important implication of this is that logistics systems must not be over-regulated. To be effective, a logistics system will operate with some elements in a relatively stable condition and many others in a state of flux. When circumstances are rapidly changing and swift adaptation is required logistics systems must be capable of operating in non-standard ways.

## Logistics and Military Operations

1.35 The nature of any military operation is shaped to a significant degree by logistics concepts and capabilities. At the same time, logistics and the way that support is conducted are profoundly influenced by the particular circumstances of a war, campaign, battle, or the peacetime environment. These circumstances include, but are not limited to:

- geography
- climate and weather
- resources
- technology
- population



- culture
- politics
- style of warfare employed
- scale
- skill of commanders
- the goals pursued by various combatants.

### Violence and Danger

1.36 Violence and danger are fundamental characteristics of military operations. Because logistics is a function of military operations, the logistics system and the units and personnel that operate that system will therefore be subject to degrees of violence and danger. Characteristics such as force protection and dispersal that enable forces to function in such an environment must be considered in the design of logistic systems.

### Security

1.37 Adversaries routinely target logistics systems because they are complex and have many vulnerabilities. Reliance on information technology (IT) to drive and order inventories, for example, is a major cyber risk as orders can be cancelled, rerouted, or simply used to infer our intentions. A close relationship with security planners and providers is necessary throughout the logistic system. Security considerations may also feature in stockholding policy decisions – especially when an expensive but scarce item is mission essential.

### Friction

1.38 Logistics is also subject to friction to the same degree as other functions in military operations. Activities that are a routine part of both civilian and military life in time of peace become much harder to conduct in a war-like situation. Friction can take a number of forms in particular physical and

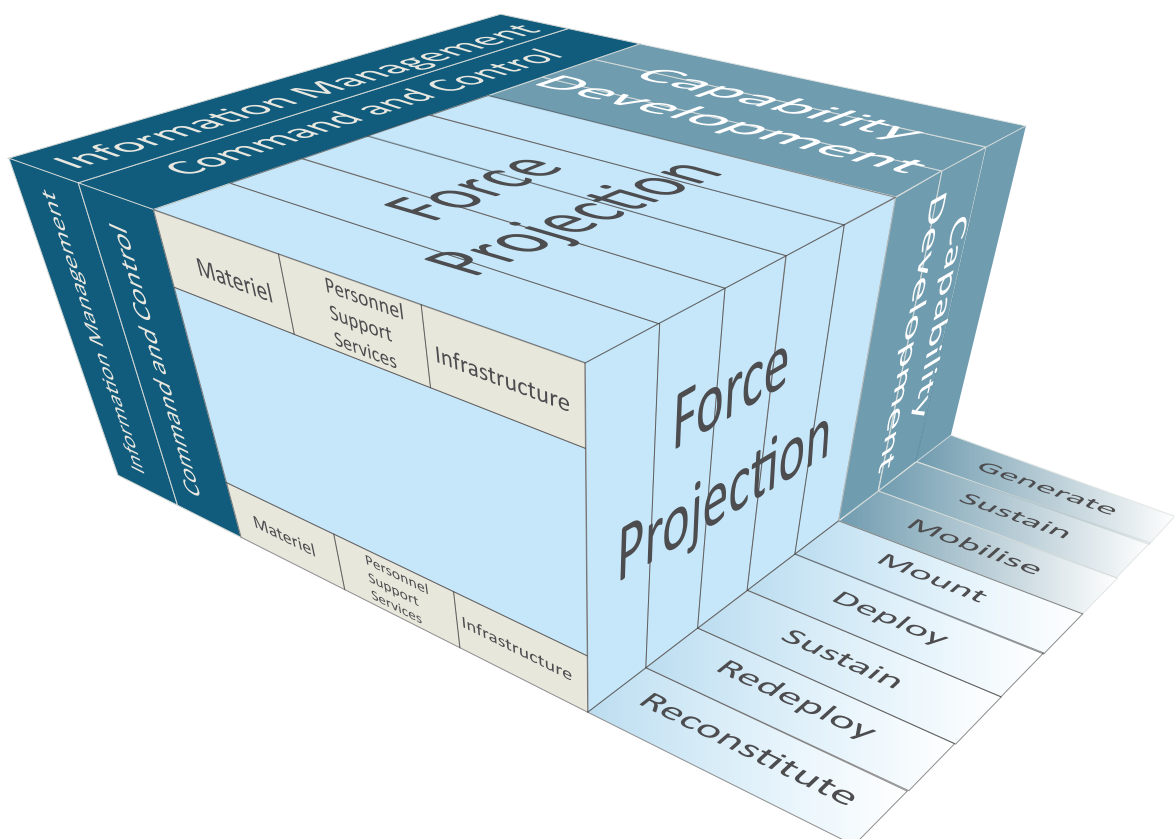


Figure 1-5: The facets of logistics

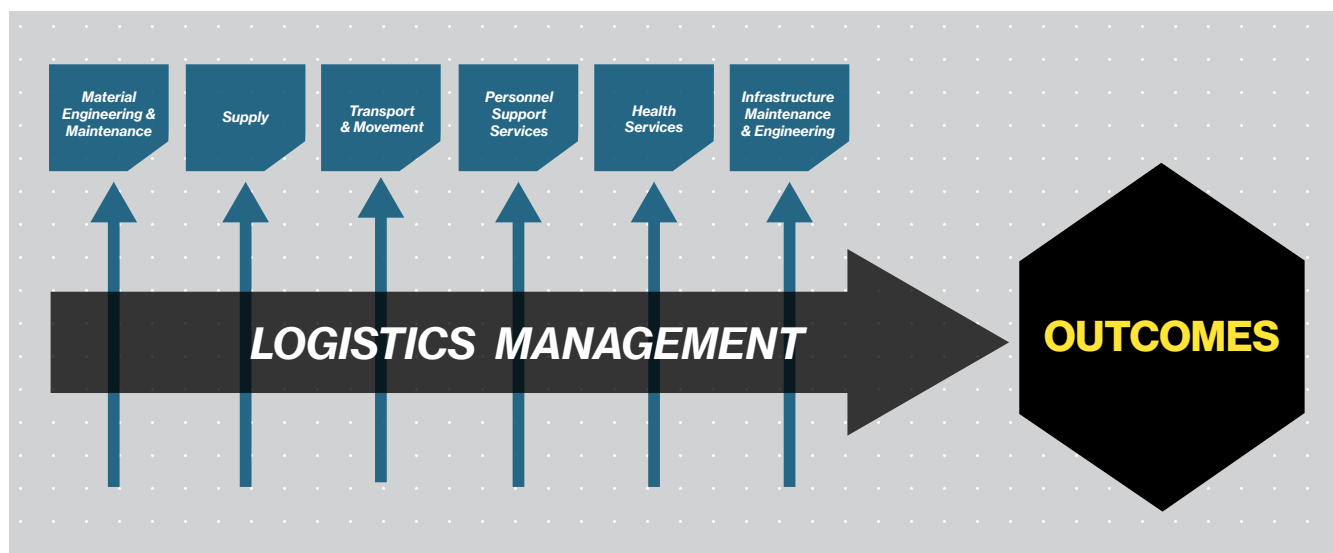


Figure 1–6: Logistics management.

psychological, which are greatly increased by enemy action. It is therefore important to cope with friction in logistics in the same manner as other aspects of warfighting by striving for simplicity and flexibility, despite the complexity of tasks and functions of logistics, and by fostering innovation.

### Logistics System

1.39 Logistics is a multi-dimensional and complex activity that constitutes an essential component of warfare. The system incorporates organic NZDF support capabilities, multinational partner capabilities, host nation support, contracted support, and NZDF and commercial support within the NSA. NZDF logistics can be viewed as a system of interrelated and interconnected systems. The NZDF logistics system includes three interconnected networks, founded upon the professional mastery of logisticians who make the system function. The system networks are as follows:

- a control network that includes all command and management aspects of logistics
- an information network that includes a myriad of information sources and systems
- a physical network that includes all logistics resources and installations.

### Logistics Functions

1.40 Logistics should not simply be defined as just a function, task, or system but rather in the context of a holistic endeavour. The managerial, engineering, and technical activities involved do not constitute the art and science of logistics by themselves. In order to compartmentalise logistics into manageable and understandable elements, logistics is often broken down into the areas related to the outputs of the logistics activity (infrastructure, personnel and materiel logistics) or functional areas based on the grouping of like activities, which are described further on.

1.41 Logistics also has a different focus and different temporal phases within each support dimension and involves numerous processes to meet the required outcome, which must be appropriately managed and controlled.

1.42 Figure 1-5 is a simplistic representation of the various facets of logistics that must be aligned, coordinated, and managed to achieve the diverse outcomes required.

1.43 Logistics is normally broken down into six broad functional areas. They are:

- supply
- materiel engineering and maintenance

- transport and movement
- personnel support service
- health services
- infrastructure maintenance and engineering.

1.44 Logistics systems and plans are usually developed for each functional area however, while each functional area is essential in and of itself, all functions must be integrated into the overall logistic system to ensure full support of operational force elements. For example, developing maintenance plans without regard to their impact on supply and transportation would result in inefficient and potentially ineffective support. Just as HSS planning would be impossible without considering supply, transport, maintenance, and infrastructure support.

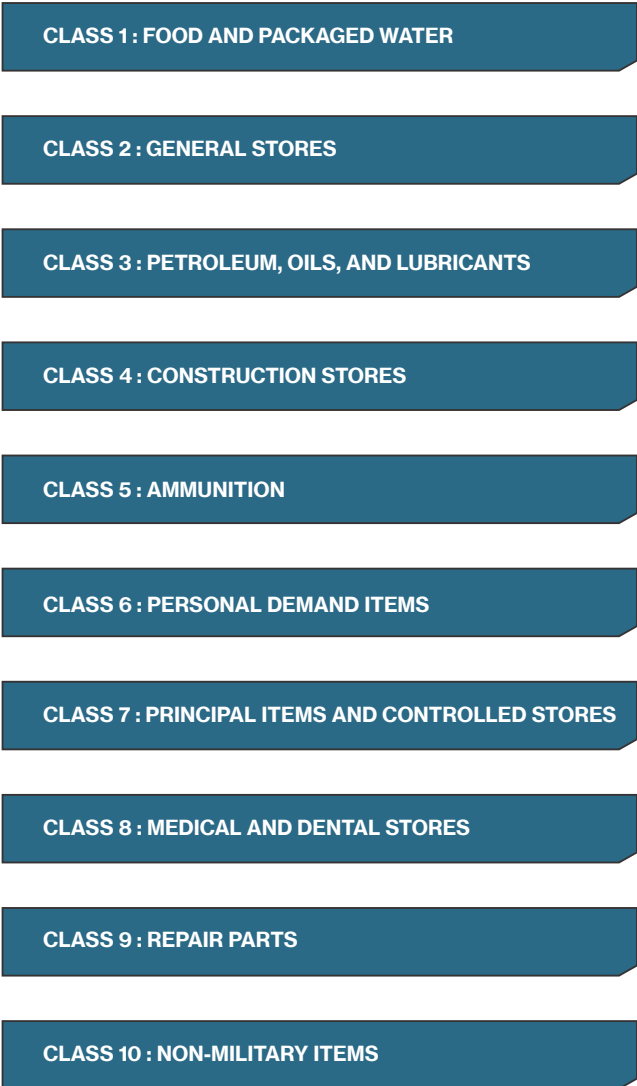
### Supply

1.45 Supply includes actions to acquire, manage, receive, store, and issue the materiel required by the operating forces to equip and sustain the force. The supply function includes:

- requirements determination
- procurement
- contracting
- provisioning
- warehousing/storage
- inventory management
- issuing, receipting, and disposal.

1.46 The NZDF supply system, in common with NATO, manages significant numbers of items, which are grouped into ten classes of supply for management and planning purposes. These are shown in figure 1-7. Supply support is generally managed along environmental lines in order to maximise efficiency and effectiveness. Supply support is derived from internal organisations as well as external sources such as:

- other government agencies



**Figure 1-7: Classes of supply.**

- commercial contractors and vendors
- allied supply agencies
- host nation support.

### Materiel Engineering and Maintenance

1.47 Materiel engineering and maintenance includes a wide range of activities required to ensure that materiel used by the NZDF meets the readiness and capability sustainment requirements. It also includes the necessary activities required to ensure that technical integrity, worthiness, and safety requirements are being met. The functional components of materiel engineering and maintenance includes the following:

- design
- construction
- test
- evaluation
- configuration control
- modification
- servicing
- repair
- overhaul
- reclamation, recovery, and evacuation.

1.48 Servicing, repair, and overhaul can be conducted at varying levels. These levels can be

applied flexibly and should only be used when appropriate to the situation. For example, in many situations, intermediate level maintenance would not be required. The levels are:

- **Organisational or Operational (1<sup>st</sup> Line).** Organisational maintenance consists of unit level corrective and preventative maintenance. It is the responsibility of the unit to which the equipment is assigned.
- **Intermediate (2<sup>nd</sup> and 3<sup>rd</sup> Line).** Intermediate maintenance is normally beyond the capabilities of the using unit, but is not so extensive as to require major industrial facilities or equipment. It involves calibration, repair, or replacement of damaged or unserviceable parts, components, or assemblies; emergency manufacture of available parts; and technical assistance to unit personnel.



Figure 1-8: Commanders should carefully consider transport and movement options when deploying personnel and equipment.

Intermediate maintenance provides a forward source of maintenance support that allows the supported force to maintain or recover mission capability within a theatre of operations. It is usually the responsibility of maintenance elements providing direct or general support to units assigned the equipment.

- **Depot or Deeper Level (4<sup>th</sup> Line).** Depot or deeper level maintenance involves major overhaul or a complete rebuild of parts, assemblies, subassemblies, and end-items, and may support organisational or intermediate maintenance by providing technical assistance. It is usually performed by contractors.

1.49 Transport and movement, as with all other functional areas, will be considered at every level of command. In addition but separate to the levels of command, transport is usually considered in terms of strategic, operational, and tactical transport based mainly on distances as follows.

- **Strategic Transport.** Strategic transport encompasses the movement of resources to and from the theatre of operations.
- **Operational Transport.** Operational transport is the bridge between the strategic lift provider and the operating forces. Logistics over the shore (LOTS) operations, transport to and from afloat support, and aircraft or road transport delivering from points of disembarkation (POD) direct to tactical units are generally considered operational transport.
- **Tactical Transport.** Tactical transport includes transport assets that are organic or assigned to support a force to provide for sustainability within an area of operations (AO).

## Transport and Movement

1.50 Transport and movement includes the movement of units, personnel, equipment, and supplies. It is essentially the support needed to put sustainability assets (personnel and materiel) in the correct location at the proper time in order to start and maintain operations. The transport and

movement system also provides for the movement of casualties, mail and other critical services. It includes landing support (including logistics over the shore), port and terminal operations, air delivery, materials handling equipment (MHE) operations, and freight and passenger transport.

1.51 This functional area is generally considered in two broad areas: movements and transport. Movements is the planning, organising, directing, and controlling of the movement of personnel and materiel, whereas transport is the actual physical movement which includes mode operation and planning, as well as terminal operations.

1.52 These levels of transport are used for planning and to describe the main transport segments, but should not constrain how transport is employed within the overall logistics system to achieve the distribution outcome. Ultimately, the outcomes required will drive how transport assets are used and controlled.

## Support Services to Personnel

1.53 Support services to personnel include non-materiel support activities and consist of various functions and tasks that are essential to the wellbeing of a force. This support extends to those areas of personnel support, quality of life, and morale issues that help define the combat effectiveness of the individual. Included in this category of support are services such as billeting; catering (as opposed to distribution of class 1 supplies); laundry, textile repair, and clothing exchange; shower and bath; postal services; mortuary affairs; and amenities/ recreational services. This functional area does not include legal services, chaplaincy, service conditions, pay and finance, the administration of discipline, or the career management of personnel.

## Health Services

1.54 Health services optimise the health of NZDF personnel by minimising the effects of wounds, injuries,

disease, and environmental factors on NZDF unit effectiveness, readiness, and morale. This functional area includes technical control of some medical and dental materiel; patient movement; casualty collection, treatment and temporary holding; primary care; hospitalisation; medical laboratory services; blood management; vector control; health protection services; veterinary services; dental services; and preventative health care. Additionally it includes training personnel in first aid; maintaining medical intelligence files; implementing preventative medicine measures; disposing of medical waste; and ensuring the combat readiness of deployed and deployable health care personnel. Health services also maintains oversight of the supply of medical and dental materiel and blood and blood products.

1.55 Specific HSS doctrine is further detailed in NZDDP –1.0 *Personnel* and associated health publications.

## Infrastructure Maintenance and Engineering

1.56 Infrastructure maintenance and engineering includes the construction, damage repair, operation and maintenance of roads and facilities, and logistics enhancements required to sustain military operations. Army engineers are traditionally the lead in this area of the NZDF. The main components of this functional area are engineer reconnaissance; horizontal and vertical construction; essential services (for example, power, water, sewage, cooling and heating); facilities management and maintenance; environmental management services; protection (for example, strong points and road blocks); demolition and obstacle removal; and explosive ordnance removal. Examples of infrastructure engineering products include shelter, warehouses, supply routes, terminals, hospitals, water production facilities/equipment, electric power, sewerage treatment, water and fuel storage and distribution, and environmental support operations.

## Logistics within the New Zealand Defence Force

### Joint Logistics

1.57 Whilst the NZDF has engaged in joint operations for some time under the command of Commander Joint Forces New Zealand (COMJFNZ) and subordinate joint commanders, it does not immediately follow that logistics has simultaneously become or needed to become wholly joint in nature. Joint operations offer obvious benefits in terms of joint effects, such as amphibious operations and close air support to land operations. However, joint logistics are not driven by the same imperatives. The single Services have substantial and unique logistic requirements that in many cases do not lend themselves to becoming joint in nature. Joint logistics arises in the first instance from the management and coordination of single Service logistics by a joint commander and staff at the strategic and operational levels, which is now a standard practice in the NZDF. Joint logistics seeks to optimise the logistics support to the NZDF by identifying common support requirements that can be delivered by one environment or a joint support element.

1.58 **Organisational Functions.** The principal NZDF logistics organisations and their broad functions are as follows.

- **The Royal New Zealand Navy (RNZN), New Zealand Army (NZ Army), and Royal New Zealand Air Force (RNZAF)** raises, trains, and sustains forces for operations, and manages in-service capabilities.
- **Headquarters Joint Forces New Zealand (HQJFNZ)** plans, mounts, and conducts campaigns, operations, and other activities for the defence of New Zealand and its interests. HQJFNZ's role includes command of military operations and exercises, and non-combat contributions to national support. The J4 Branch provides logistic staff and planning advice to the Commander.

- **Joint Defence Services.**
- **Defence Logistics Command (DLC)** leads the coordinated delivery of efficient and effective logistics within the national support base in support of training and operations. DLC also coordinates the development of logistic strategy, policies, and processes. DLC includes:
  - **Defence Logistics Commands Maritime, Land, and Air** provide third and fourth line domain specific maintenance, repair and overhaul, and logistic support for equipment and platforms operated by the services.
  - **Defence Equipment Management Organisation** provide third and fourth line NZDF maintenance, repair, and overhaul, and logistic support for equipment that is common to two or more of the Services.
  - **Defence Supply Chain Group** provides oversight and direction over common logistics support functions including integrated logistics support, codification services, inventory management, logistics information management support, and disposal services.
  - **Defence Shared Services Group (DSSG)** provide domestic support services at Defence camps and bases including but not restricted to catering and accommodation services, travel, administration, and other personnel support services.
- **Defence Commercial Services (DCS)** provides commercial support to the NZDF in relation to all third party expenditure (including operational) while supporting the generation of outputs.
- **Directorate of Industry Engagement (DIE)** develops successful partnerships with industry by encouraging innovative outcomes, increased economies and efficiencies, and reduces total costs of ownership.

## Single Service Logistics

1.59 While the logistic functions and systems found within each Service have similarities there are

also points of difference. These differences are mainly due to the environments within which each Service operates. In very general terms, single Service logistics can be characterised as follows.

- **Royal New Zealand Navy.** The RNZN logistics focuses on support to ships, which have substantial integral logistic support capabilities and rely on access to afloat logistics or that available from New Zealand and international ports. Smaller vessels with lesser integral logistics are more heavily reliant on access to ports. Access to suitable ports or afloat logistics is a potential constraint on maritime operations.
- **New Zealand Army.** The logistics challenges for the Army can be varied because most land force elements are required to be highly mobile and therefore can have only light integral logistic support capabilities. Army units are generally reliant on logistic support from a series of mobile echelons that are established to provide various levels of support. Army units are generally more reliant on fixed logistic facilities or bases within New Zealand.
- **Royal New Zealand Air Force.** The RNZAF logistics support to aircraft operations is provided in most cases from fixed New Zealand and international bases and airfields. Access to suitable airfields is a potential constraint on aircraft operations.

## Industry Logistics Partnerships

1.60 The NZDF is not capable of generating and sustaining many of its capabilities and supporting operations solely from its organic resources. In line with this constraint, the NZDF seeks to establish long-term collaborative strategic partnerships with industry, a development that redefines the nature of former NZDF industry partnerships. In the future there will be larger longer term contracts, covering a broader range of activities, and which are based on partnering principles rather than narrow product-based relationships. These contracts will need to address security aspects and will require formal security accreditation in some contracts.

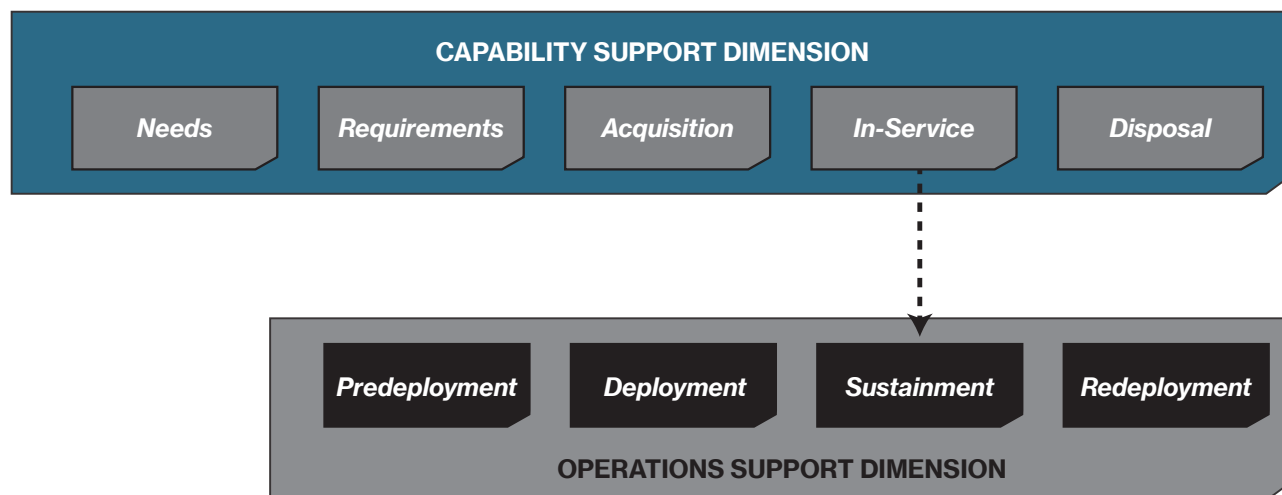


Figure 1-9: Support dimensions.

## Support Dimensions

1.61 Logistics plays a significant role in any military action whether the action is part of war, stability or support operations (SASO), or a training activity. The mission of NZDF logistics is to generate and sustain the operational preparedness of the NZDF and to support the employment of those forces to achieve a designated outcome, which may vary across the conflict spectrum.

1.62 In essence, logistic operations must contribute to the mission success through the three key functions of force generation, force deployment and redeployment, and force sustainment. In achieving this, logistic support is effectively provided within two support dimensions.

1.63 Logistics must firstly provide the support required to generate and sustain capabilities throughout their life as well as reconstituting them in order to ensure capabilities are appropriately prepared for operations.

1.64 Secondly, logistic operations must support the mounting of a tailored force and its projection into, and sustainment within, the operational environment. These dimensions differ in terms of their time frames, objectives, and measures of success. Dividing logistics into these two dimensions enables the appropriate mission focus at all levels of support.

1.65 Logistics contributes to operational results through force generation (that includes requirements definition and acquisition) and in-service support, including preparedness management and support to operations. In achieving this, logistic support is effectively provided within two support dimensions: capability support and operations support (as illustrated in Figure 1-9).

### Capability Support

1.66 Capability support is the support needed to acquire and support capabilities in-service and to ensure that capabilities are prepared for deployment on operations. This dimension operates over longer time frames and is focused on achieving designated levels of capability. Success in capability support is measured by the degree of preparedness that is achieved compared to the level of resources that are applied. This includes the definition of support requirements, acquisition of capability, and in-service support, which encompasses preparedness management and support to defence operations.

1.67 This dimension exists primarily within the NSA and it is a strategic level logistic function. There is significant potential to utilise industry and non-uniformed personnel for the provision of capability support.



## Operations Support

1.68 This is the support needed to deploy, redeploy, and sustain a force for the duration of an operation. It sits within, and is enabled by, the capability support dimension in that it mounts and sustains forces using the logistic system established in the capability support dimension. Operations support requires the establishment of a tailored logistic network that draws resources from the NSA, international sources, and the single Services, and positions those resources at the appropriate time and place using various support bases, logistic nodes, and transport modes to meet the needs of the supported force.

1.69 The operations support dimension comprises both the theatre of operations as well as that component of the NSA contributing to the direct support of the operation. It is usually defined by shorter time frames and is focused on supporting forces that have been directed to achieve a specific outcome. Its measure of success is therefore its ability to enable the achievement of specified missions.

1.70 **Combat Service Support.** The term combat service support (CSS) has its origins in the Army

and is now being used more widely. CSS is a subset of operations support. It is the support provided to combat forces, primarily in the fields of administration and logistics.

1.71 CSS supports the essential capabilities, functions, activities, and tasks necessary to sustain all elements of operating forces in theatre at all levels of war. It is the activity that actually provides services and supplies to the combat forces. The CSS organisation(s) supporting joint forces operating in complex environments therefore must be tailored, modular, flexible, and fully integrated into the command structure.

1.72 Since most of the delivery of resources occurs at the tactical level of war, CSS is considered to be essentially the same as tactical logistics.

## Logistics and the Levels of Command

1.73 The NZDF manages its contribution to national security through three interrelated levels of command: strategic, operational, and tactical. These levels of command reflect the distribution of responsibilities for planning and directing military

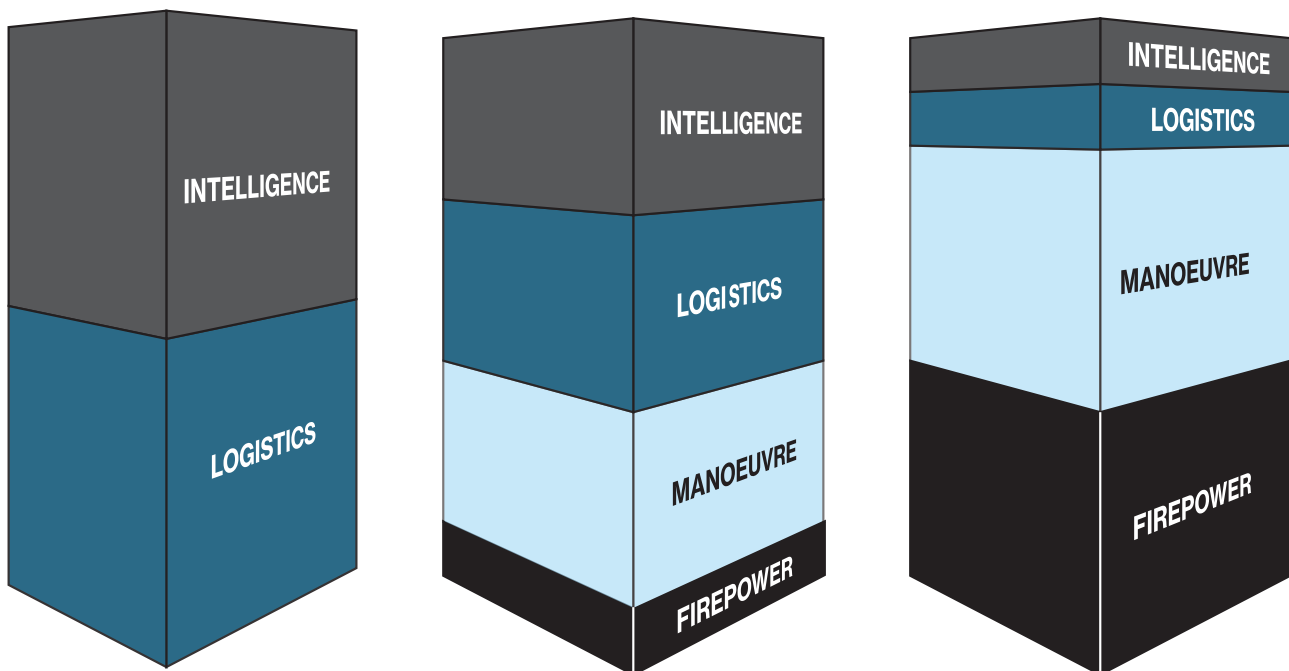


Figure 1-10: Relative significance of logistics at each level of command.

resources across the full range of operations. Logistics in support of operations is a crucial consideration at all levels of command. The relative significance of logistics compared with the other elements of military power differs at each level of command (as illustrated in Figure 1-10).

1.74 At the strategic level, logistics commanders and managers function predominantly in the capability support dimension and focus on achieving the national aim and military strategic end state. This involves developing, acquiring, managing, preparing, and mobilising forces. At the operational level logistics commanders function predominantly in the operations support dimension and focus on supporting campaigns in pursuit of national strategic objectives. The operational level logistics focus is on mounting, deploying, integrating, sustaining, and redeploying forces, enabled by capability support. At the tactical level, logistics commanders function entirely within the operations support dimension and focus on achieving operational end states. This includes replenishing, recovering, maintaining, reorganising, and reinforcing assigned forces.

## Generating Logistic Capability

1.75 Logistic capability is derived from a combination of force structure and preparedness. Preparedness is further refined in terms of readiness and sustainability: the ability to undertake military operations. Readiness denotes a force's ability to be committed to operations within a specified time. Readiness refers to the availability, proficiency and serviceability of personnel, equipment, facilities, and consumables allocated to a force. Sustainability refers to the provision of personnel, logistics, and other support, including recovery and reconstitution required to maintain and prolong operations or combat until successful accomplishment of the mission.

## Principles of Logistics

### General

1.76 NZDF logistics is codified by a set of

principles. The principles of logistics are enduring statements that have stood the test of time and provide valuable parameters for logistic activities. The principles are not absolute or dogma, and are not intended to be constraints. It is expected that the principles will be applied with good judgement and common sense. The principles may be used, for example, to assist in the formulation of plans, conduct of operations, guide analysis and review, and develop new systems. The relative emphasis placed on the principles will vary from one operation, activity, and environmental domain to the next. The principles of logistics are the following.

- **Foresight.** Foresight is the ability to anticipate future operational support requirements and to identify, accumulate, and maintain assets, capabilities, and information needed to support them. Logisticians at all levels must be able to anticipate future events and the associated logistic requirements. The principle aim of logisticians is to maximise the freedom of action of the operational commander by ensuring the operational or tactical plan is not limited or delayed by logistic constraints that could have been and should have been anticipated. Logisticians should reconstitute the previous phase, continually support the current phase, and plan and preposition for subsequent phases.
- **Co-operation.** Co-operation and coordination between the NZDF, allies, coalition forces, and strategic commercial partners is essential to optimise the logistics footprint. Consideration of the ability to utilise or provide logistic support to allied or coalition force elements is essential in any operational planning. The logistic planning solutions should also consider use of strategic and international commercial contractors to enhance logistic support. When the use of commercial contractors is considered economical, the decisions to enter into support arrangements should be enduring. Resultant relationships can be complex and require clear parameters and guidelines in the form of memoranda of understanding (MOU) to avoid the exploitation of scarce resources by one of the participants.

## Real-Life Example: Cooperation in Action

The NZDF makes extensive use of arrangements, agreements, and MOU to formalise cooperative effort. However, less formal cooperation efforts arising from relationships built by NZDF logisticians with other militaries through working groups can also result in substantial benefits to NZDF operations.

The New Zealand light armoured vehicle (NZLAV) was deployed at short notice in support of operations in Afghanistan. However, due to the proliferation of improvised explosive devices (IED) in that theatre, the threat level was significantly different from the type of protection provided by the existing NZLAV survivability systems. A survivability upgrade was therefore required.

By utilising the knowledge and personal contacts developed from attendance at the light armoured vehicle user nation group, the NZDF was able to quickly source a series of kits that improved the levels of protection for the vehicle and passengers. These kits included a variety of armour and blast seating which had been developed separately for the Canadian Army and the United States Army. As the kits had never been fitted to a vehicle of the same configuration as NZLAV, they were integrated into the NZLAV survivability systems utilising the vehicle manufacturer as the lead integrator. This solution enhanced survivability and reduced programme risk. It also provided confidence that the solutions had undergone destructive testing by other customers that would have been prohibitively expensive for NZDF.

The use of the light armoured vehicle user nation group demonstrates how international logistics co-operation can save time and cost and reduce risk.

- **Economy.** Economy is closely related to the principle of co-operation. Economy is best achieved when effective support is provided using the fewest resources at the lowest cost and within acceptable levels of risk. When prioritising and allocating resources, staff must continuously consider the optimum military logistics footprint required to provide the outcome necessary to meet the Commander's intent. Therefore economy and optimisation of resources are to be combined to ensure effectiveness and mission success. The requirement for economy, allied to effectiveness, is to be given detailed consideration in order to ensure that alternative means of achieving the outputs are taken into account. For example, non-military support solutions may be appropriate at some stage in the operations.
- **Simplicity.** Simplicity is avoiding unnecessary complexity in preparing, planning, and conducting logistic operations. Simplicity serves to foster efficiency in both planning and execution of logistic operations. Support to operations will often be complex and detailed but logistic plans must be simple and easily understood. Logistic plans should, where possible, allow the logistic main effort to be changed when required from one force element to another rapidly. Unnecessarily complicated logistic plans are likely to frustrate the initiative of subordinate logistic commanders and increase risk and potential confusion. The use of clearly understood standard operating procedures for routine or recurring logistic functions will ease planning and enhance interoperability with allied forces.
- **Flexibility.** Flexibility is the ability to adapt logistic structures and procedures to changing situations, missions, and concepts of operations. Logistic support dedicated or organic to operational force elements must be as dynamic, mobile, and responsive as the operational force elements themselves. Flexibility exemplifies logistic resourcefulness, with logistic plans being flexible in order to achieve both operational

responsiveness to meet the commander's intent as well as economy. Logistic plans should reflect the understanding that the overall plan will be subject to sudden or radical change and are to include alternative planning, anticipation, security considerations, reserve assets, redundancy, forward support, and centralised control with decentralised operations.

- **Sustainability.** Sustainability is a measure of the ability to maintain logistic support to all users for the duration of the operation or the lifetime of a capability. Sustainability relates to having enough personnel to replace or rotate deployed forces during a prolonged operation; serviceability of major platforms and other equipment; the quantities of available supplies and replacement items; and the ability of critical functions, such as sea and airlift, to be used at elevated or prolonged rates of effort. Sustainability involves achieving a balance between demand, duration, distance, resources, priority, and risk. Sustainability is achieved through effective planning; accurate projections of requirements; careful application of the principles of economy, responsiveness, and flexibility to provide the required support; and successful protection and maintenance of the lines of communication.

CHAPTER 2:

# CONTEMPORARY LOGISTICS





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## Introduction

### Background

2.01 During the twentieth century, the world experienced the full range of conflict. When the Cold War ended in the early 1990s, the geopolitical situation became more fluid and consequently more complex. The threat of nuclear annihilation receded, while the prevalence of regional wars, and especially those underpinned by religious and ethnic unrest, increased markedly. Over the same period the variable economic performance of many countries and the parallel development of technology complicated regional and global strategic relationships even further. Cumulatively, these developments suggest that conflict in the twenty-first century will be no less challenging.

2.02 The world is still witnessing a tendency towards asymmetric and indirect forms of conflict. These forms of conflict include:

- terrorism, transnational crime, and corruption
- economic warfare: attacks on key infrastructure systems to sabotage key industries and disrupt economic life
- cyber-attacks: corrupting or disabling key information databases, digital sensors, and control systems
- environmental warfare: the deliberate destruction of, or damage to, eco-systems to sabotage economic activity or degrade the environment.

2.03 The operational environment is becoming increasingly congested, cluttered, contested,



Figure 2-1: The New Zealand Defence Force often operates in complex, dynamic, and unpredictable environments.

connected, and constrained. Civilians are more directly or indirectly involved or affected by conflict. The distinctions between military and non-military forces, civilians, combatants, and non-combatants have become increasingly blurred. This trend is set to continue.

2.04 Beginning with East Timor in 1999 followed by Afghanistan in 2001, the Solomon Islands in 2003, and ongoing involvement in these and other theatres since that time, the New Zealand Defence Force's (NZDF) sustained period of high operational tempo has placed heavy demands on defence logistics capabilities and capacities. The diversity of locations and conditions faced by the NZDF in recent deployments means that new equipment often has to be acquired and existing equipment adapted or enhanced, at short notice. In addition, there has been the challenge of deploying and supporting the NZDF in demanding operational environments far from New Zealand. Strategic uncertainty gives little guidance as to where the next challenge might arise, and innovative approaches are required in addition to prudent contingency planning based on hard won experience.

2.05 In response, NZDF logistics remains forward-looking and on a path of continuous modernisation. The logistic force-in-being responds to the support demands of current operations within the context of the contemporary operating environment.

## Characteristics of the Contemporary Operating Environment

### Joint, Interagency, and Multinational Environment

2.06 Today's complex security environment means that operations undertaken by New Zealand's military forces will generally be in a joint, inter-agency, and multinational (JIM) environment. The NZDF will normally contribute task-organised force elements to a wider coalition, which could include other armed forces, non-governmental organisations (NGO), United Nations (UN) agencies, and national and foreign government agencies.

2.07 Whilst each participant will be responsible to varying degrees for their own logistics requirements, it is also essential that a mutually beneficial logistics support approach is adopted; this ensures an economy of effort.

2.08 In a JIM environment, the NZDF will frequently find itself being both a provider and receiver of logistic support. This is best achieved through a collective approach to planning that is based on maximising interoperability, adaptability, and liaison. Accordingly, logistics planning is best undertaken where practicable collaboratively between participating governments, military forces, civilian agencies, and international NGOs.

2.09 To enhance effectiveness in a JIM environment, the NZDF has entered into a range of international logistics agreements, arrangements, and relationships that enhance its capacity and preparedness to participate in multinational operations and that provides access to international sources of support.

### Range of Joint Operations

2.10 Joint operations are a complex mixture ranging across the competition continuum from armed conflict to cooperation and they extend from providing various forms of support to local and international civilian communities to matters of national survival.<sup>5</sup> Figure 2-2 illustrates the complex nature of joint operations. Logistic planning in the capability support dimension needs to address the range of joint operations and where possible develop adaptable systems that can function successfully across the range. Given the diversity of the range of operations, it may not be possible for the NZDF to acquire logistic systems to support all circumstances. Balance can be achieved by sourcing support options from organisations outside the NZDF, including local and international industry, other government agencies, and other defence forces.

<sup>5</sup> Joint operations are described in greater detail in NZDDP–3.0 *Campaigns and Operations* (2<sup>nd</sup> Edition).



## Impact of Globalisation and Commerce

2.11 Military technology and the economics of arms production are changing. The most visible change has been a consolidation of the commercial structure of defence industry internationally. In response to rising costs and falling defence spending following the end of the Cold War, defence industry in the United States (US) underwent a wholesale consolidation that saw the number of large manufacturers fall dramatically. A similar trend has been occurring in Europe, albeit more slowly. In addition, as the cost of military equipment generally continues to grow as technologies advances, the number of weapons systems acquired by countries will likely fall. Consequently global industry consolidation is likely to continue, resulting in fewer potential sources of military equipment and technology for New Zealand. While this will result in a smaller number of suppliers and therefore reduced competition, it will have the compensating benefit of creating larger more sustainable international firms.

### Key Term

#### Military Capability

Military capability is the capacity to achieve a desired operational objective in a selected environment, and to sustain that effort for a designated period.

2.12 At the same time, the economics of military equipment production will force the development of a greater number of multinational programmes and also increase the use of commercial off-the-shelf and military off-the-shelf technology in military applications and solutions. The very limited New Zealand domestic defence industry means that our military capability will largely depend upon multinational defence firms. Global companies will continue to perform an important role in supplying and supporting the full range of the NZDF's needs. These trends bring a mixture of opportunities and challenges that demand a proactive response if the NZDF is to continue to get the equipment and support it needs.

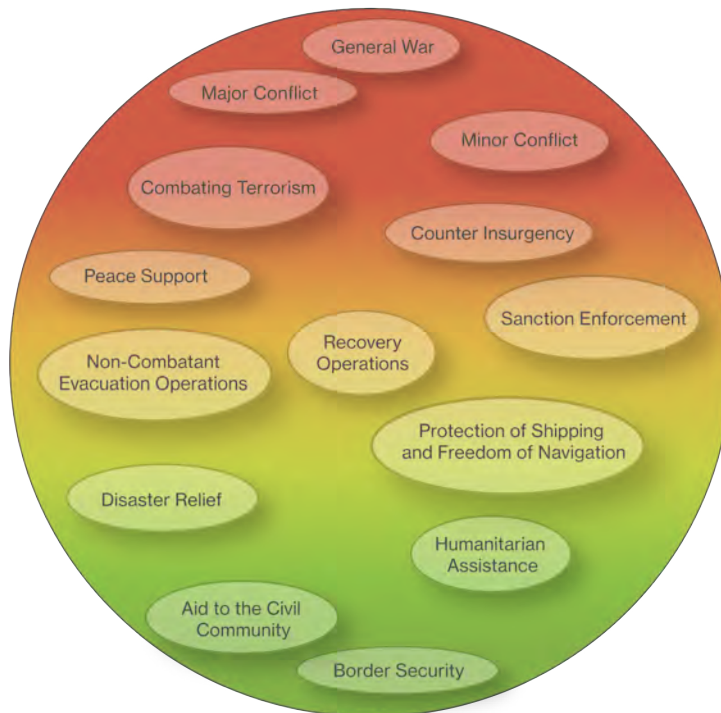


Figure 2-2: Range and type of joint operations.

## **Real-Life Example: New Zealand Defence Force Working with Other Government Departments Following the Christchurch Mosque Shootings**

On 15 March 2019 a lone gunman carried out two terrorist attacks on mosques in Christchurch killing 51 people. Following the immediate response, for the first time in New Zealand history the government responded by raising the terrorism threat level to high. The New Zealand Police were required to increase immediately their presence in Christchurch by supplementing it from staff across the country. Due to increased demand and a shortage of resources in Christchurch, the New Zealand Police requested logistic and specialist support from New Zealand Defence Force (NZDF) for Operation DEAN.

The NZDF immediately established liaison staff (LNO) in Police National Headquarters and in Christchurch Police Station to coordinate NZDF support to the response. Support provided by the NZDF included fixed-wing transport of equipment and personnel to and from Christchurch, including prisoner transport of the suspect. The New Zealand Army also provided ground transport in Christchurch, accommodation and messing at Burnham Camp and West Melton Training Facility, and ammunition storage at Burnham. The NZDF assisted in the construction of a temporary morgue at Christchurch Hospital and then staffed it with NZDF mortuary affairs and disaster victim identification (DVI) qualified personnel. The NZDF planned and were prepared to establish additional temporary mortuary facilities at Christchurch Airport to support the repatriation of international victims; however, this was not executed.

On 29 March 2019, a national memorial service was held in Christchurch with additional services held in other main cities of New Zealand. VIP guests for the Christchurch service included Governors General and Prime Ministers from New Zealand and Australia, and large delegations of international government representatives. Due to the heightened security and stretched resources, NZ Police requested further support from the NZDF for Operation UNITY.

For Operation UNITY, the NZDF continued to move New Zealand Police personnel and equipment in and out of Christchurch in the build up to the service. This extended to transport of very important person (VIP) personnel on the day of the service. Accommodation and messing continued for the New Zealand Police and was extended to Australian Federal Police and Saint John personnel. Takeaway meals were provided to New Zealand Police personnel working on security tasks throughout the city. On the day of the event, additional contingency support was prepositioned in main centres, including rotary wing assets, emergency response groups, protected mobility, and specialist search and explosive ordnance disposal support. Throughout both operations, the NZDF was able to contribute capabilities and resources to the other government and non-government organisations that were not commercially or readily available. This demonstrated agility in being to support and strengthen relationships with the New Zealand Police and other supporting agencies.

## Other Contemporary Influences

2.13 Modern warfare is continually changing as technological developments transform the ways that operations are conducted. The political environment – whether domestic, regional, or global – in which operations are conducted is also changing continuously over time. The changes in technology affect the capability of military systems and also the general conditions in society under which operations are conducted. These societal conditions include the state of a society's transport, communications, health, and education systems, and also the role of the mass media. Some of the key characteristics of the contemporary operating environment include the following.

- **Increasing Tempo and Concurrency of Operations.** In an increasingly uncertain international security environment, the NZDF has found itself continuously involved in operations ranging from war through stability to peace support and disaster relief. The tempo of operations has increased as technology has overcome the limitations of night, adverse weather, and geography. This has placed additional demand on defence logistics to provide support over long lines of communication and to maintain capabilities subject to higher than anticipated usage rates in harsh and diverse environments.
- **Joint and Multinational Operations.** Multinational operations have become normal. This style of operation has placed increasing demands on logistic systems to be interoperable between the Services and with external partners, many of whom are non-traditional partners. The greatest challenge is to remain interoperable with Australia, Canada, the United Kingdom (UK), and the United States (US) – known as the Five Eyes – and other highly advanced allies, and at the same time remain interoperable with our regional neighbours.
- **Comprehensive Approach.** New Zealand recognises that an enduring operational outcome may entail significant collaboration between international governments and military forces, international organisations, and non-government

organisations to execute a coordinated diplomatic, military, and civilian response. In some cases, operations involving the NZDF may be led by government departments other than the NZDF. For example, the NZDF support to Operation CHRISTCHURCH QUAKE involved the NZDF operating in support of the Ministry of Civil Defence and Emergency Management (MCDEM).

- **Supporting Government Departments and Agencies.** The responsibility for logistically supporting other government agencies outside New Zealand usually falls to the NZDF. The relationship that the NZDF has with those other departments continues to take on an increased importance. Some of the departments the NZDF has a working relationship with are:
  - Aviation Security Service
  - Department of Corrections
  - Department of Conservation
  - Fire and Emergency New Zealand
  - Government Communications Security Bureau
  - MCDEM or the new National Emergency Management Agency (NEMA)
  - Ministry of Foreign Affairs & Trade
  - Ministry of Business Innovation and Employment
  - Ministry of Primary Industries
  - Maritime Safety Authority
  - New Zealand Police
  - New Zealand Customs Service
  - New Zealand Security Intelligence Service
  - New Zealand Transport Agency
  - Ministry of Health.
- **Non-linear Operational Environment Threats.** Contemporary operations are predominantly conducted in non-linear situations where threats permeate the operational environment. In contemporary operational environments asymmetric threats have assumed greater significance and may target logistic installations and information systems in the national support base or along extended lines of communication in preference to more traditional military targets.

## Real-Life Example: Operation HAVRE

Operation HAVRE is an annual commitment and a standing NZDF Output 4.1 resource and border protection operation (RBPO). Operation HAVRE saw support to other government organisations (OGA) namely the Department of Conservation (DOC), the New Zealand Met Service (NZMet) and GNS NZ. Operation HAVRE area of operations was the Kermadec Island group region with primary operations being carried out on Raoul Island. 5th Movements Company (5 Mov Coy) provided an aerial delivery detachment in support in order to conduct underslung operations mounted from HMNZS CANTERBURY to Raoul Island. HMNZS CANTERBURY was the lead planning unit for the operation with support elements including 6 Squadron RNZAF (6 Sqn) and 5 Mov Coy. The principle activities for Operation HAVRE included; personnel, equipment and provisions resupply, annual meteorological station servicing, and transport of DOC and GNS NZ scientists.

As Operation HAVRE is an annual commitment DOC and 5 Mov Coy have developed an agreement to work together and provide annual aerial delivery training prior to the operation beginning. DOC rotate their staff through Raoul Island where RNZAF P3 Orions and C-130s conduct regular aerial delivery resupplies of mail and essential supplies. Because of the good relationship between DOC and 5 Mov Coy, soldiers from 5 Mov Coy now provide a condensed version of the drop zone recovery and clearance course in order to ensure the DOC workers that are about to post to the island are equipped with the skills they need to be safe around aerial delivery resupplies. DOC greatly values the relationship between the NZDF and themselves and now calls on 5 Mov Coy through Headquarters Joint Forces New Zealand (HQJFNZ) for advice on aerial delivery.

Logisticians need to assess the physical and electronic risks to logistic systems and ensure that appropriate protective arrangements are made.

- **Geographic Diversity.** Strategic uncertainty applies not only to the types of operations but the geography as well. Lines of communication have been stretched over great distances and into unfamiliar locations with poor infrastructure. The associated logistic challenges have been just as diverse and have required adaptation, flexibility, and resourcefulness. Rapid acquisition of theatre specific equipment has become a common approach to resolving theatre-specific requirements, along with the management of in-theatre stock holding policies. It is to be expected that the challenges of geographically diverse theatres will continue.
- **Environmental Issues.** The NZDF is a significant Crown land owner with approximately 74,000

hectares of land and over 140 identified heritage sites. The NZDF is also a significant user of New Zealand maritime and air space and it has a duty to ensure all its activities are completed in an environmentally and ecologically responsible manner.

- Logisticians are responsible for complying with instructions, policies, and standards to minimise environmental hazards and impacts such as emissions and to reduce or eliminate the toxic by-products of logistic activities. On operations and exercises, commanders are responsible for ensuring that all logistic activities accord with NZDF policy for the management of hazardous substances, environment, and infrastructure and with relevant legislation established by central, regional, and local government. Relevant statutes include:
  - Resource Management Act 1991 (RMA)

- Hazardous Substances and New Organisms Act 1996
  - Building Act 2004
  - Maritime Transport Act 1994 (MTA)
  - Health and Safety at Work Act 2015
  - Biosecurity Act 1993
  - Ozone Layer Protection Act 1996
  - Antarctic (Environmental Protection) Act 1994.
- **Regional and District Plans.** Under the RMA, regional and district plans are made which impose rules. Operational aspects of environmental management on Defence lands are described in the *Defence Estate Management Manual*. Specific advice on management of environmental issues can be obtained from Defence Estate and Infrastructure (Environmental Services).
  - **Cultural and Heritage Issues.** The NZDF deploys to a diverse range of theatres, many with thousands of years of human history. Potential logistic sites may have cultural or heritage significance and/or value. Heritage sites may be either natural or cultural places. The United Nations Educational, Scientific, and Cultural Organisation maintains a register of significant sites. Logisticians are required to be alert to cultural and/or heritage implications. The protection of cultural property must be considered when conducting pre-deployment reconnaissance of the joint force area of operations (JFAO). Advice should also be sought from Defence Legal Services (DLS) or J09 (Legal) where there is concern logistic activities may pose legal risks.

## Commercial Support

### Introduction

2.14 The NZDF does not have the logistics capacity to support operations without support from industry. The need to reduce costs, the increased complexity of technology, and intellectual property limitations imposed by original equipment manufacturers (restricting the NZDF's ability to undertake many repair, maintenance, and overhaul

tasks ourselves) requires an increased use of contractor logistic support. As a result logistics and sustainment has shifted from a Service-oriented delivery model to one that goes beyond traditional understanding of the joint delivery model and has now become 'blended' with industry. The focus is now to achieve the logistic objective by the most efficient means possible: be it military or commercial solutions or a balanced combination of both.<sup>6</sup>

2.15 Critical to this is that NZDF logisticians must be intelligent customers and develop the skills and commercial acumen to fully understand commercial logistics (including its limitations and characteristics) so that they can use commercial options to their advantage.

### Considerations when Contracting for Commercial Support

2.16 **Government Rules of Sourcing.** NZDF procurement practices are required to comply with the Government rules of sourcing. The purposes of the rules are to strengthen accountability; promote open, transparent and competitive procurement processes; attain value for money; meet New Zealand's commitments to free trade; ensure procurement processes are predictable; and make it easier for companies to engage in the procurement process.

2.17 The Government rules of sourcing do allow for opt out provisions to be applied which are relevant to the NZDF. This includes the ability to enter into procurements between the NZDF and other government agencies, procurements undertaken overseas, non-contractual arrangements including other arrangements and agreements, and procurement of arms, ammunition, and other war materials.

2.18 **Managing Risk.** An important part of securing best procurement outcomes from commercial

<sup>6</sup> The balance between value for money and maintaining a sustainable organic logistics capability.

providers is the management of risk by both parties. Engaging commercial logistics providers is not without risk. Off-shore sourcing may bring higher levels of risk as a result of extended lead-times, greater buffer stocks, and potentially higher levels of obsolescence where one supplier is responsible for the sole supply of an item. Several well-documented cases exist where major supply chain disruptions have been caused because of a failure at a single source. The risks are obvious, may be unavoidable, and must be mitigated.

## Contracting in Areas of Operations

2.19 The use of defence industry contractors in areas of operations has now become commonplace. The requirement has been driven by a mixture of factors but the reality is that the NZDF and most coalition partners do not have the capacity to provide or instantaneously grow logistics support to meet the full suite of operational outcomes. At times the engagement of local contactors is also an essential element of the Government's broader strategy that seeks to rebuild struggling nations.

2.20 Contractors in areas of operations may be arranged directly by the NZDF or where the NZDF utilises contract arrangements put in place by coalition members such as the US Army logistics civil augmentation program.

2.21 Logisticians are expected to appreciate the strengths, limitations, and risks associated with engaging contractors to provide essential military support. Caution must be exercised when considering the use of contractors in areas of operations as they may have undesirable affiliations and relationships that are not immediately apparent and should prompt either field security or counter intelligence (CI) involvement in their accreditation. Caution must also be exercised in writing the contract; for example, it must specify which country's law is to apply. Further to this, use of contractors in areas of operations is subject to the same level of public scrutiny as if they were based in New Zealand. Therefore their legal status and the bounds of acceptable conduct of must be clearly and deliberately determined prior to their engagement.

## Contracting in the National Support Base: Building Industry Partnerships

2.22 Cost-effective and timely delivery of equipment and support to the NZDF is best achieved by the NZDF and industry working together. The many successes achieved jointly by the NZDF and industry in rapidly equipping and supporting the NZDF on overseas deployments attests to the fundamental strength of the relationship.

2.23 Many NZDF procurements are extended programs that can last for a decade or more. In such circumstances, there are significant strategic and security benefits from an approach that allows changes to be made as technology evolves, specifications are refined, and opportunities for productivity gains emerge. This sort of flexibility can be achieved through a variety of contractual mechanisms – ranging from incentive-based alliances through to fixed-price contracts – provided that a 'partnership' approach is taken to managing changes. Better outcomes are possible for both the NZDF and its suppliers by taking a partnering approach to procurement.

2.24 Partnering requires that both sides have the skills and commercial acumen to work together and, importantly, to protect their own interests. The NZDF has become a more intelligent customer and in doing so relies upon logisticians in Defence Logistics Command (DLC) and Capability Branch along with procurement and commercial management professionals in Defence Commercial Services (DCS) to bring the NZDF procurement and contracting policy, procedures, and templates into line with commercial best practice.

2.25 Good communication is essential to an effective working relationship between the NZDF and industry. Communication is especially important between the NZDF's capability end-users and industry. Without direct feedback from the operators and consumers of NZDF materiel, supplies, and services, industry is unlikely to be able to provide equipment and support that is fully attuned to the needs of the NZDF.

2.26 The extent to which NZDF logistics can partner with industry is nevertheless limited by a range of Government policies and the capacity of industry to respond to NZDF operational requirements. Industry is ultimately focussed on profitability rather than achieving national strategic aims and providing freedom of manoeuvre to an operational commander. Government and industry regulation, plus commercial practicalities – such as investment returns, business growth, and job security – do not sit comfortably with operational uncertainty, the requirement to deploy to unfamiliar and often hostile environments, and the potentially catastrophic consequences of failure in logistics support to operations. The result is that there tends to be a preponderance of industry logistics in the national support area (NSA) where efficiency is a prime consideration, and a prevalence of military logistics in an operational area where effectiveness is the prime consideration.

## Emerging Technology

2.27 In addition to the impact of globalisation and the changing commercial support solutions, emerging technology continues to change and offer improvements at unprecedented rates. Generally, military equipment is becoming more complex, more reliant on digital components, and less repairable (other than by component replacement). In many ways commercial companies continue to be at the forefront of logistics innovation using emerging technology as it generates greater competitive advantage. Within this context the following changes within military logistics continue to have an impact.

### Autonomous Logistics Data and Routines

2.28 Access and control of logistics data is a critical facilitator to both militaries and original



Figure 2-3: New Zealand Defence Force worked with other agencies and departments as part of the response to the Kaikoura earthquakes.

### Real-Life Example: New Zealand Defence Force working with other Government Departments during the Christchurch Quake.

The February 2011 Christchurch quake had a magnitude of 6.3 and killed 185 people. The earthquake caused widespread damage across Christchurch, especially in the central city and eastern suburbs. The Government declared a state of national emergency which stayed in force until 30 April 2011. The February quake was the most damaging in a year-long earthquake swarm affecting the Christchurch area. It was followed by a large aftershock on 13th June (which caused considerable damage) and a series of shocks on the 23 December 2011.

The NZDF involvement in Christchurch involved providing immediate comprehensive humanitarian aid and disaster relief (HADR) response. The NZDF provided logistics, equipment, transport, air bridges, evacuations, supply, and equipment shipments.

The Royal New Zealand Air Force (RNZAF) provided an air bridge between Christchurch and Wellington using a Boeing 757 and two C-130 Hercules. They brought in emergency crews and equipment and evacuated North Island residents and tourists out of Christchurch. The crew of the Navy ship HMNZS CANTERBURY provided meals for a 1,000 people left homeless and accommodation for a small number of locals. The army operated desalination plants to provide water to the eastern suburbs.

The NZDF were able to contribute niche capabilities and rapidly adapt to new requirements or where capability gaps exist. The NZDF had the ability to facilitate, enable, and enhance command and control awareness, planning, and logistic support.

The NZDF demonstrated capacity and capability in being able to support and strengthen relationships with New Zealand Civil Defence and other government departments during the crisis. There was a unity of purpose between the NZDF and all other bodies and this enabled speed and efficiency. A British urban search and rescue (USAR) team leader present at the crisis observed that it was the 'best organised emergency response' he had witnessed.

equipment manufacturers. Modern equipment is now frequently fitted with sensors that provide direct and real time data feeds to original equipment manufacturers (OEM) on the performance, sparing and maintenance requirements of equipment. The benefits of logistic data feeds is that it enables a more agile and responsive supply chain by OEMs which reduce lead times for support. It can also triggers requirements for advance or deferred maintenance requirements based on real time data being collected.

2.29 However OEM accessing logistics data poses challenges in terms of who owns the data and how the security of data is being managed – for example, through encryption or block chain

technology – and how this may impact on availability of capability. Invariably the shift to autonomous logistics data and routines places more knowledge in the hands of OEM and often limits the ability of militaries to undertake any substantial maintenance, repair, or overhaul of equipment. This may also impact on those logistics trades which have previously been able or required to undertake intermediate and deep level maintenance functions.

#### Artificial Intelligence

2.30 Linked to autonomous logistics data and routines is the growth in the use of artificial intelligence (AI) using big data and deep learning





Figure 2-4: A US Cargo Resupply Unmanned Aircraft System prepares for flight at Camp Bastion, Afghanistan in 2014.

systems. The ability to aggregate data and have AI algorithms learn and then act upon logistics requirements offers greater flexibility and the opportunity to allocate scarce resources more efficiently. However, AI may also have the impact of moving response and prioritisation decisions into the realm of OEM rather than the NZDF.

2.31 This will require consideration of any unintended consequences that may arise including the potential impact on sustainment to operations. Therefore, NZDF logisticians will need to ensure that future commercial support contracts factor in the growing use of AI to ensure that NZDF interests are protected.

## Unmanned Logistics Support Systems

2.32 Unmanned logistics support systems comprising extensive use of robotics and automation are now in use in military and commercial sectors. Early use of such systems were found in simple warehouse picking roles allowing the removal of personnel from routine tasks. This had the impact of reducing personnel requirements, increasing speed and in accuracy in inventory management, and allowing 24/7 operations.

2.33 However, lessons learned from Afghanistan and Iraq (where the extensive use of improvised explosive devices (IED) and the impact of harsh terrain weather conditions has placed personnel at risk and threatened the use of conventional supply lines) has accelerated the development and use of unmanned

logistics systems. This has included the use of unmanned aerial vehicles, unmanned ground vehicles, and, more recently, robotic walking mules. These systems are destined to make a greater presence in the execution of logistics support activities and will promise greater flexibility, safety, and speed in delivering of materiel and reduce the need for humans in the battle space.

## Alternative Energy

2.34 Modern equipment and the nature of agile operations have resulted in an ever-growing demand for electrical energy and fuel. Conventional methods of meeting these requirements are no longer adequate, not only due to the demand itself but also the load it places on conventional supply chains. Alternative energy and fuel options are being adopted by militaries as a means of meeting future requirements. These include the use of photovoltaics, hybrid vehicles, methanol and hydrogen based fuel cells, and piezoelectricity energy generation. Not only do these technologies create alternative ways to meet energy and fuel demands, they can also reduce conventional logistics footprints.

## Additive Manufacturing and Reverse Engineering

2.35 The provision of spares through real time manufacturing using 3D and 4D printing is now providing a means to accelerate supply and availability of spares required. It is also a means through reverse engineering of manufacturing items which have previously been declared obsolete. The technology has been widely used by the US Marine Corps for field manufacturing of radio components, tools, medical equipment, and mortar systems. Likewise, additive manufacturing is now being used by the European Defence Agency through the construction of manufacturing facilities within International Organisation for Standardisation (ISO) containers. This allows for the ready transportation of the capability to areas of operation as required.

2.36 While the use of additive manufacturing enables rapid production of materiel and has the ability to address obsolescence through reverse engineering, it also presents a number of issues which may limit its use to a research and development role:

- it requires personnel to be trained to use additive manufacturing equipment
- the ability to manufacture any product is likely to be controlled by OEM intellectual property rights
- it requires the acquisition and transportation raw materials to the site where the manufacturing will be undertaken.

## Obsolescence

2.37 As noted above, changes in technology continue to advance at an unprecedented rates, which means that systems are becoming obsolescent more quickly. It has been well understood that defence capabilities are now more likely to undergo more than one upgrade during their life to keep pace with technological advances. This is the norm and the traditional response to this has been to:

- enter into long-term buys of spares and components
- enter into end-of-life last-time buy orders of spares and components
- acquire OEM intellectual property to enable manufacturing of obsolete components.

2.38 In reality, these strategies will only be partially successful and will result in a growth of inventory, storage space, and deterioration, all of which will negatively impact on available funds. Furthermore, it is likely that there will be unanticipated compatibility problems where other parts of capability have been upgraded through normal OEM succession of products and which no longer can be integrated with older components. The only means of addressing obsolescence is through thorough proactive capability management and integrated logistics support planning.

2.39 While obsolescence has traditionally been considered a matter which relates only to materiel, it now also impacts the human dimension. The role of the NZDF logistician will need to evolve from the management and maintenance of materiel to the management of technology and data which results in materiel. All of the emergent technologies will demand more from NZDF logisticians in terms of the management, control, and security of data.

## Balanced Logistics

2.40 In the past, logistics systems that lacked visibility and control mechanisms have generally adopted a demand-based system where distribution is determined by and responsive to client demands. This approach has created a lag in the system that has been overcome by imprecise predictive analysis of support requirements. Future networked logistics systems will have operational environment situational awareness, visibility of stocks, and the transport modes to provide much more flexible and accurate distribution of supplies. The result will be logistic systems where stocks held in the national support base and stocks distributed to the theatre will be balanced. The emphasis will be on materiel flow rather than static, demand/response supply and support chains. Networked logistics is a prerequisite for achieving balanced logistics. It will require the establishment of common distribution processes and procedures between the Services and wider Defence logistics community, including industry.

### Characteristics

2.41 The key characteristics of a balanced logistic system are as follows.

- **Velocity over Mass.** This reflects the requirement to minimise the in-theatre stockholding by maximising the materiel flow through the various components of the logistic system. This may require more frequent distributions in smaller quantities and a changed movement priority system. Balanced logistics will enable materiel to bypass nodes where necessary and flow via the optimal route.

- **Footprint Optimisation.** The requirements of deployability, survivability, and sustainability dictate that the in-theatre logistics footprint is to be kept to an optimum size. This does not necessarily translate into a *minimum* footprint as the need to support the deployed force with whatever logistic resources are required remains paramount. Accessing support from outside the theatre can contribute to balance and reduce the threat to logistics within an area of operations. This can be achieved through the use of 'reach-back' and 'reach-out'.
- **Reach-back.** Reach-back enables deployed forces to access military and non-military support from the most appropriate source outside their operational environment. Such sources could include neighbouring units, other force support assets, and the national or international support base.
- **Reach-out.** Reach-out – also known as side-casting – involves sourcing using alternative support arrangements rather than relying on lines of communication back to the national support base. Reach-out sources include local purchase, neighbouring agencies and forces, coalition partners, the host nation, United Nations arrangements, extant contracts within theatre (not necessarily engaged by the NZDF), and implementing arrangements with other nations.
- **Total Asset Visibility.** Decentralised execution of the logistics function will be dependent upon the information network providing accurate and timely visibility of materiel and personnel within the physical network.
- **Reliable Delivery.** Seamless integration of the three networks is the critical facilitator to ensure reliable delivery of commodities and services to the deployed force. There must be sufficient flexibility to enable consignment destinations to change whilst those consignments are moving through the system.



CHAPTER 3:

# MILITARY STRATEGY AND LOGISTICS





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## Introduction

### Background

3.01 New Zealand's Defence policy settings are expressed in the *Strategic Defence Policy Statement 2018*. This presents an assessment of New Zealand's strategic environment and sets out Government's expectations for the roles the Defence Force will perform in order to promote the overall wellbeing of New Zealand, its communities and environment. The capabilities required to give effect to these Defence policy settings will be outlined in the Defence capability plan.

3.02 The policy statement established the primary operating area for the Defence Force to be New Zealand's territory (including its Exclusive Economic Zone (EEZ)) and its neighbourhood, from Antarctica through the South Pacific. The Defence Force must be prepared to operate independently – and lead operations – in these areas if required. New Zealand's national security and interests also depend, however, on events further afield. The New Zealand Government expects the Defence Force to be able to contribute to operations in support of Asia-Pacific regional security, as well as worldwide in support of the maintenance of the international rules-based order. To be able to contribute effectively to these operations, the Government expects the Defence Force to be interoperable with New Zealand's allies and other key security partners.

3.03 New Zealand has recognised that contemporary operations – whether at home or abroad – generally require an all-of-government response. Such responses integrate security activities alongside other tasks to achieve broader objectives. The New Zealand Defence Force (NZDF) capability to deploy rapidly and establish a basic level of security will often be an essential element of a New Zealand response to a crisis situation but will – in nearly all cases – not be a sufficient response in itself.

3.04 This comprehensive approach has particular implications for logistics, including an expectation

that military logistics will be integrated with other government agencies, commercial logistics capabilities, and international military and civilian logistics capabilities when appropriate. A degree of dependence on the global supply chain to support the NZDF is accepted within the principle of self-reliance.

3.05 The nature, range, and duration of operations undertaken in pursuit of New Zealand's defence policy provide significant challenges for the NZDF's logistics. A robust, flexible, and responsive logistics system that is integrated with civilian and other military logistics is needed to support the operational diversity required of the NZDF.

## Military Strategy and Logistics

### Introduction to Military Strategy

3.06 The Government determines the national security interests that shape defence policy. The NZDF works with other government agencies and departments to achieve national security interests and ensure New Zealand is safe and secure. The Government's strategy is to draw on all elements of national power to safeguard the security of New Zealand. National policy objectives are achieved through effective application of all three instruments of national power: diplomatic, information, economic, and military (DIME).<sup>7</sup>

3.07 **Diplomatic Instrument.** The diplomatic instrument enables the achievement of New Zealand's policy objectives through diplomatic means. Successful diplomacy depends upon persuasion, effective communication, and the skilful interplay of the military and economic instruments.

3.08 **Information.** Information is an important instrument of national power and a strategic resource critical to national security. Previously considered in

<sup>7</sup> The NZDF has recently aligned with the US and the UK and included information as an element of national power. This will be changed in NZDDP-D *New Zealand Defence Doctrine* in due course.



Figure 3-1: The military, along with the diplomatic and economic, is one of the New Zealand government's instruments of national power.

the context of traditional nation-states, the concept of information as an instrument of national power extends to non-state actors – such as terrorists and transnational criminal groups – that are using information to further their causes and undermine those of the New Zealand Government and our allies. The NZDF operates in a dynamic age of interconnected global networks and evolving social media platforms. Every NZDF action that is planned or executed, word that is written or spoken, and image that is displayed or relayed, communicates the intent of the NZDF, and by extension the New Zealand Government, with the resulting potential for strategic outcomes.

3.09 Intelligence and information received across government shapes planning and execution at all levels. Efficient management of information provides

the opportunity to influence a range of audiences and activities in a coherent manner.

3.10 **Economic Instrument.** Economic power can provide a range of incentives, boycotts, tariffs, and sanctions to influence decisions and behaviour. Military force may be required to support the economic instrument, through embargo operations and naval cooperation and guidance for shipping, for example.

3.11 **Military Instrument.** Military power is most effective when employed in conjunction with the other instruments to achieve national objectives. The application of force or the threat of its use against elements seeking to erode security helps to maintain the integrity and security of the international system. New Zealand maintains a balanced and credible range of military capabilities that are held at appropriate readiness levels.



3.12 **Additional Instruments.** In addition to these traditional instruments of national power, it is increasingly recognised that there are actually a number of other ‘tools’ governments have to achieve their policy objectives. These additional instruments include:

- the law
- financial
- development funds and programmes
- intelligence.

### The Logistics Dimension of National Power

3.13 Much of what constitutes national power has a logistics dimension and has implications for the capacity of NZDF logistics to support New Zealand’s national security interests. Particular areas that have a direct bearing in the capacity of NZDF logistics are:

- geography
- physical infrastructure
- levels of industrial development
- levels of commercial development.

3.14 The Government draws elements of national power together into national security policy and strategy, which is in turn translated into military strategic outcomes. The Ministry of Defence (MOD), working in close cooperation with the NZDF, distils national strategic guidance into military strategy including a series of strategic outcomes and broad tasks which the NZDF is to be prepared to undertake. Within the NZDF arena, strategic guidance is further broken down at each of the three contiguous, overlapping, and interrelated levels of command and management: the strategic, operational, and tactical levels.

### Logistics Input to Strategy

3.15 A national security strategy relies upon the elements of national power to make contributions to

an all-of-government response to national security crises. Logistics has a central role to play in supporting the NZDF to achieve the military strategic outcomes sought in concert with other government departments and New Zealand commercial entities. In many respects logistics is at the forefront of New Zealand’s all of government approach, particularly in relation to the following:

- strengthening multinational logistics support agreements and arrangements with defence partners
- strengthening civil-military partnerships
- developing the NZDF’s industry partnerships
- supporting high operational tempo
- reconciling demand requirements with supply constraints
- achieving more efficient use of resources
- improving interoperability
- providing adaptable humanitarian assistance and disaster relief capabilities.

### Logistics Advice

3.16 **Military Strategic Level.** NZDF logistics command and management arrangements have been constructed to provide appropriate logistics input at each of the levels of command. At the strategic level, Commander Logistics (COMLOG), in the role of the Strategic J4, provides logistics input to the national and military strategic level, assisted by senior NZDF environmental logistics commanders. The J4 Headquarters Joint Forces New Zealand (HQJFNZ) is an operational level stakeholder for joint logistics and is responsible for ensuring that logistics issues are fully considered in operations. With COMLOG, they inform capability planning as detailed in Chapter 4.

3.17 **Operational Level.** The J4 HQJFNZ is the principal adviser at the operational level with regard to campaigns and operations. COMLOG and Defence Logistics Command (DLC) provides the Service Chiefs,

## Real- Life Example: National Support Element New Zealand Forces in East Timor

To support New Zealand Forces in East Timor (NZFOREM), an NSE was established in Darwin Australia and tasked initially only to support Royal New Zealand Air Force (RNZAF) 3 Squadron detachment operations. Given the growing criticality of the NSE as a node to provide sustainment and administrative support, the NSE was enhanced to support the wider NZFOREM requirements for all deployed force elements.

The NSE establishment of twenty-six personnel was drawn from across the entire NZDF. The NSE comprised a command element, a finance section, a local purchase section, systems, applications and products (SAP) operators, a mail cell, an air loading team, a movement control detachment, and an administrative detachment. The Australian Defence Force (ADF) provided considerable assistance through providing accommodation, work facilities, furnishings, computers, and vehicles.

The operation of the NSE highlighted early on that the NZDF must establish NSEs with the aim of providing support to all of the deployed force elements to ensure that sustainment in theatre is appropriately balanced and prioritised. The operations also highlighted the importance and benefits of working closely with the ADF.

*From Observations from New Zealand Forces in East Timor September 1999-March 2003*

Commander Joint Forces New Zealand (COMJFNZ) and other operational commanders with logistic and technical forward support (see Chapter 4) required to deliver the required outputs on campaigns, operations, exercises, and other activities.

3.18 **Tactical Level.** At the tactical level, the DLC provides tactical level logistics support by supplementing with personnel and expertise and advice to force elements, defence support units (DSU), national support elements (NSE), and force insertion and extraction teams (FIET).

### Strategic Warning Time

3.19 One of the key issues associated with providing military options in response to security crises is the warning related to the situation. Logistics is both a key facilitator and a constraint on the successful management of warning time. Warning time is considered in two contexts as follows:

- capability warning time
- crisis warning time.

## Key Terms

### Capability Warning Time

The time between a contingency arising and the capacity of the NZDF and its support agencies to produce a responding capability. Capabilities generally take considerable time to be generated because they usually involve consideration of options, a decision-making process to acquire, acquisition and introduction to service (including organisation, personnel, collective training, supplies, facilities, support, and command and management inputs).

### Crisis Warning Time

The time between New Zealand learning that a crisis might occur and that crisis taking place. In some cases this warning time may be extremely short, such as in the case of a weather related disaster.

3.20 Whilst all operations require logistic support to some extent, many that may arise at short to mid-term have significant logistic implications that may affect the NZDF's capacity to provide military options within the warning time. Such operations call for carefully considered logistic advice, for example:

- natural disaster relief, either in New Zealand or overseas
- evacuation of New Zealand nationals and nationals of third party countries, from a foreign country, with or without the support and assistance of that foreign country, and perhaps during a civil war or other form of civil disorder
- participation in and, in some cases, leading multinational peacekeeping and peace enforcement operations, especially in peace operations
- support to a democratic regional government threatened by anti-democratic forces or widespread breakdown of law and order (at the request of that government)
- in extreme circumstances, unilateral intervention in other countries for humanitarian purposes
- participation in multinational operations in regional conflicts
- defence of New Zealand sovereignty against direct military threat or attack
- participation in general war, especially one involving New Zealand's national survival.

### Key Term

#### Sustainability

Sustainability refers to the ability of a force to maintain the necessary levels of combat power for the period necessary to achieve its objectives.

## Sustainability and Sustainment

### Introduction

3.21 Sustainment refers to the provision of personnel and logistics support and any other form of support required maintaining deployed force capability until successful accomplishment of the mission. Sustainability estimations are essentially a strategic risk management activity in which considerations relating to the sustainability of a force must be balanced against its force structure, readiness, and the operational outcome sought by Government. Sustainability considerations extend beyond supply and include materiel, personnel, and other technical, administrative, and infrastructure support required to sustain NZDF capabilities. New Zealand's ability to sustain forces draws upon support organic to NZDF and also the capacity of the national support area and international support sources.

3.22 Sustainability concerns every phase of an operation – from generation, mounting, deployment, and sustainment to redeployment/reconstitution – is dependent on the ability of the operational supply chain to deliver the right item, to the right place, at the right time, in the right quantity. The supply chain is a cyclical process that supports:

- the forward movement process that terminates when the customer or operator in the field receives the item they have demanded through the supply system
- return logistics or the reverse supply chain, which is the return or rearward flow of repairable items and redundant or surplus material for subsequent reconstitution, rotation to stock, and redistribution, back loading, and disposal.

3.23 Sustainability considerations influence strategic decisions regarding the level of commitment, duration, tempo, and the level of intensity of a campaign or operation. Government guidance on matters such as rotation policies, strategic and operational end states, duration and access to resources beyond those organic to NZDF including

New Zealand national resources, and international resources and support will be critical to informing sustainability estimates.

3.24 The DLC manages the materiel sustainment of a variety of materiel systems and their products and services, ranging from stand-alone high-value capital assets platforms (such as classes of warships and aircraft) to fleets of equipment (such as vehicles and commodities like clothing and general stores) to consumables (such as combat rations, fuels, and lubricants).

## Planning and Managing Sustainability

3.25 Sustainability planning is assumption-based planning. Experience, historical analysis, and planning scenarios all have a part to play in planning sustainability. For example, operational analysis and computer-based modelling can give an indication of the likely requirement. However, sustainability estimates will also require a degree of professional judgement that balances the need to avoid over-insurance against the minimum essential sustainment needed.

3.26 Risk assessment and subsequent risk management are essential elements of managing sustainment. Strategic risk management must balance sustainability against force structure, readiness, and operational outcome. The components to capability provide the basis for sustainability planning and for expressing the sustainment requirement, and, therefore, for reporting deficiencies against the requirement.

3.27 Achieving effective sustainability depends on optimising limited resources, making decisions based on new and changing circumstances, and improvising where necessary and overcoming impediments. Sustainability planning considers sustainment issues at the three levels of command as follows.

- **Strategic.** Considers the capability to generate, rotate, reinforce, and reconstitute maritime, land, and air forces at their operational level of capability

and to sustain those forces once deployed on the mission.

- **Operational.** Considers the concurrent or sequential sustainability of forces that may be deployed in one or more joint force areas of operation (JFAO) within a theatre.
- **Tactical.** Considers the sustainability of a force within a JFAO, and focuses on specific force elements and their tasks within the JFAO.

## The Four Ds

3.28 There are many factors that influence sustainability such as attrition (of personnel and materiel), equipment availability, resource availability, training, stockholdings, risk, and concurrency. Four important factors to be considered when estimating the requirement for sustainment include destination, demand, distance, and duration; otherwise known as the 'four Ds'. Consideration of these factors will generally lead to identification of most major sustainability issues.

- **Destination.** The destination (i.e. the operational theatre) dictates the environment in which the operation is to take place, including the physical and environmental threat. The environment determines the pattern of wear and tear and storage on equipment, and the physiological demands on personnel. The destination will influence the line of communication to the operation and determine the resources required to maintain it. Destination will critically influence the resources required for deployment, the timing, speed of deployment and reaction, and the execution of subsequent operational plans. The length and difficulty in maintaining the line of communication, and the ability of the enemy to interdict it, will determine the need, or otherwise, for forward mounting bases and the extent to which non-organic resources may be required.
- **Demand.** The demand will determine the volume of support required, and will vary considerably depending on the nature of the operation. For example, the volume and nature of supplies



Figure 3-2: Destination, demand, distance, and duration are key determinants of sustainability.

demand to support humanitarian assistance operations will differ greatly from that demanded for major conflict. Demand is not simply a function of calculating the consumption or usage of supplies, but also its pattern, rate of change, and variability. Demand is related to the commander's intent and may vary with time, be cyclical, steady, or surge at particular times. Demand will determine the size of the organisation required to sustain the operation. Demand will depend on the nature and scale of the operation, the characteristics and size of the force, and also the facilities and services available within theatre. Essential to meeting the demand will be some method of prioritising demands. There will seldom be sufficient resources to meet all demands; therefore, controlled allocation of resources determined at the strategic and operational levels as part of risk management is essential.

- **Distance.** The distance both to and within the theatre of operations, and the time required to travel those distances, will determine the length, mode of transport, and capacity of supply routes. This in turn will affect the size, shape, structure, and balance of resources required to sustain the operation. It will also determine the volume of equipment required to stock any equipment regeneration process as well as transit times and the need for intermediate staging bases. Distance may vary as operations develop; therefore, there must be sufficient resources available to adjust and extend the lines of communication to maintain operational flexibility.
- **Duration.** The duration of the operation, along with the other factors such as the rate of demand, will determine the overall volume of materiel required and the size of the sustainment task. Duration will

determine the need for endurance and the need to rotate or replace personnel and supporting infrastructure. An assessment of risk will have to be made: is a short, sharp operation such as a non-combatant evacuation to be planned and sustained or is it to be a fully resourced, more deliberate prepared operation such as peace support that

takes longer to mount? Duration should also take into account the need for preparation prior to commencing operations and recovery once operations have ceased. Logisticians should note that the duration of operations is often not accurately appreciated during early planning.

### Real- Life Example: Sustainment

The inability to sustain a simple item of supply can significantly impact on deployed operations in ways that are not always obvious or predicted.

Something as simple as the availability of AA battery can affect operations. Personal role radios, light emitting diode (LED) torches, laser pointers, target designators, and other military hardware items rely on AA batteries. A computer mouse will not operate without an AA battery and with no mouse, operations plans are more difficult to disseminate. Hence without sufficient AA batteries, prosecution of military operations will be adversely affected.

In 2006, during the winter of the CRIB 7 mission in Afghanistan, the New Zealand contingent faced a logistics problem. Consumption of AA batteries had rapidly increased, and shortages were significantly impacting on CRIB 7's ability to prosecute military operations.

Investigation by the CRIB 7 logisticians team quickly confirmed that quality of the battery being used was unable to maintain effective operation in the extreme cold. Upon issue, the batteries were fully charged, but within 10 to 15 minutes of operation had become inoperable. Consultation with other nations and the New Zealand national support element (NSE) at Bagram Air Field identified one reason they were experiencing these problems was because they were operating from a base at 5000 feet and then moving through freezing mountain passes at 18000 feet.

CRIB 7 continued to utilise the batteries available from local and coalition supply chains but demand grew to in excess of a thousand batteries each week. This option would not be sustainable over the winter months ahead. The operational effectiveness of the mission was being placed at risk and an alternative supply chain solution had to be found.

The CRIB 7 logisticians with the procurement sections in the NSE and defence support unit (DSU) Middle East Region, implemented a trial of different types of AA batteries sourced from out of theatre. Comparisons were made on a product by product basis noting the different operating environments and how battery failure occurred.

The vagaries of supply chains identified that an AA Energiser battery sourced from the DSU had a superior performance to an AA Energiser battery sourced through local supply chains in Pakistan, yet they were supposed to be the same product. The issue was solved by using Lithium ion batteries sourced by the DSU. It was a simple but expensive solution. When spring arrived, CRIB 7 were then able to revert to the locally sourced AA battery as it met operational requirements for the warmer seasons.

*From Recollection from Afghanistan by Colonel M. Proctor (Rtd) Deputy Commander and Chief of Staff Crib 7*

CHAPTER 4:

# LOGISTICS COMMAND, MANAGEMENT, AND GOVERNANCE





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## Introduction

4.01 Logistic responsibilities within the New Zealand Defence Force (NZDF) is an aggregation of diverse organisations. Defence logistics includes substantial military, civilian, and commercial components. The principal defence logistics and support organisations include joint defence services, defence logistics command (DLC), defence estate and infrastructure, single Service Headquarters, and Headquarters Joint Forces New Zealand (HQJFNZ).

4.02 At the highest level, Commander Logistics (COMLOG) is responsible for leading NZDF logistics and providing specialist logistics advice to the Chief of the Defence Force (CDF). COMLOG also provides logistics advice to the Service Chiefs to support their raise, train and sustain responsibilities and as necessary the Commander Joint Forces New Zealand (COMJFNZ) to support NZDF operations.

4.03 Command of the military logistics and support organisations is subject to the normal NZDF command and control (C2) arrangements.<sup>8</sup>

## Command, Management, Governance, and Public Accountability

### Command

4.04 Command is the legal authority to direct, coordinate, and control armed forces. NZDF's doctrine on command describes several commonly recognised components, among them leadership. Although the terminology and interpretation of the components of command differ among New Zealand's traditional military partners, the generally accepted components of command are:

- authority
- leadership

- decision-making
- control.

### Management

4.05 Management refers to the physical planning, organisation, and coordination of resources necessary to achieve specified goals and objectives. Management is therefore about ensuring an organisation has the necessary means to follow a set direction. For the NZDF logistic leaders, the practice of management is essential to them marshalling and controlling the resources required to meet the demands of their own decisions and plans.

### Governance

4.06 Governance refers to the processes by which organisations are directed, controlled and held to account. Governance may be described as the people, policies, and processes that provide the framework within which commanders and managers make decisions and take actions to optimise outcomes related to their spheres of responsibility. The principles of good governance are accountability, transparency, integrity, stewardship, leadership, and efficiency.

### Key Terms

#### Management

Management is the physical planning, organisation, and coordination of resources necessary to achieve specified goals and objectives.

#### Governance

Governance is the people, policies and processes that provide the framework within which commanders and managers make decisions and take actions to optimise outcomes related to their spheres of responsibility.

<sup>8</sup> As discussed in NZDDP 00.1 – *Command and Control* (2<sup>nd</sup> Edition).

## Public Accountability

4.07 Public accountability requires that the conduct of NZDF logistics is monitored to ensure value for money is achieved. The governance arrangements that apply to NZDF logistics activities includes a range of policies, processes, procedures, management agreements, C2 arrangements, organisational structures, orders, instructions, New Zealand legislation, international arrangements and agreements, and international standards. The principal logistics governance arrangements can be found on the NZDF publication centre: <http://pub-r/ps/p0-0001/Pages/Home.aspx>

## Command, Management, and Governance Arrangements

4.08 Command, management, and governance of NZDF logistics is complex. NZDF logistics is an aggregation of diverse organisations that are not unified at the strategic level. The challenge is to achieve unity of purpose without unity of command. At the strategic level NZDF logistics is split into two streams: estate and infrastructure, and logistic sustainment. Figure 4-1 outlines the governance arrangements while Figure 4-2 outlines the command and management relationships for the logistic support stream. That is the most complex. The estate and infrastructure arrangements are less complicated.

### Estate and Infrastructure

4.09 The Head of Defence Estate and Infrastructure (HDEI) is the principal manager on all NZDF matters relating to infrastructure. They also provide advice to CDF through VCDF on the strategy, performance, and delivery (inclusive of construction) of the Defence estate. The activities of DEI are governed and managed through the capability governance board (CGB), capability management group (CMG), and capability project board for all new estate infrastructure projects and the estate investment committee and state steering group provide the same oversight of the maintenance, performance, and regeneration of the existing estate infrastructure.

## Logistic Sustainment

4.10 COMLOG has an overall coordination function on logistics sustainment and support matters and acts as the NZDF's strategic J4 in order to provide advice to the CDF, through the Chief Joint Defence Services (CJDS). However COMLOG does not have command or management authority over the entire NZDF logistics community. Rather, COMLOG coordinates logistic sustainment through collaborative arrangements and forums such as logistics leadership board (LLB), NZDF governance committees, and capability management groups (CMG).

4.11 The LLB is the senior governance body in the NZDF for logistic sustainment. It meets on a monthly basis. The LLB addresses strategic logistics issues that influence the future operations of the NZDF. The LLB also has a critical part to play in the governance of the DLC and the broader NZDF logistics and support system.

4.12 The management of DLC is exercised through monthly meetings of the CMT. These meetings of the LLB have the opportunity to address routine operational matters whilst adopting a future focus.

4.13 Figures 4-1 and 4-2 outlines the complex arrangements of command, management, and governance of the logistics sustainment functions across the NZDF. The figures shows the variety of diverse organisations that are involved and the relationships between, governance, command, management, and support.

4.14 The NZDF's logistic sustainment command and management responsibilities are not bound or constrained by the strategic, operational, and tactical levels. The practical application of operational and tactical NZDF logistic sustainment command and management arrangements is situational, requiring close consultation and coordination where responsibilities overlap.

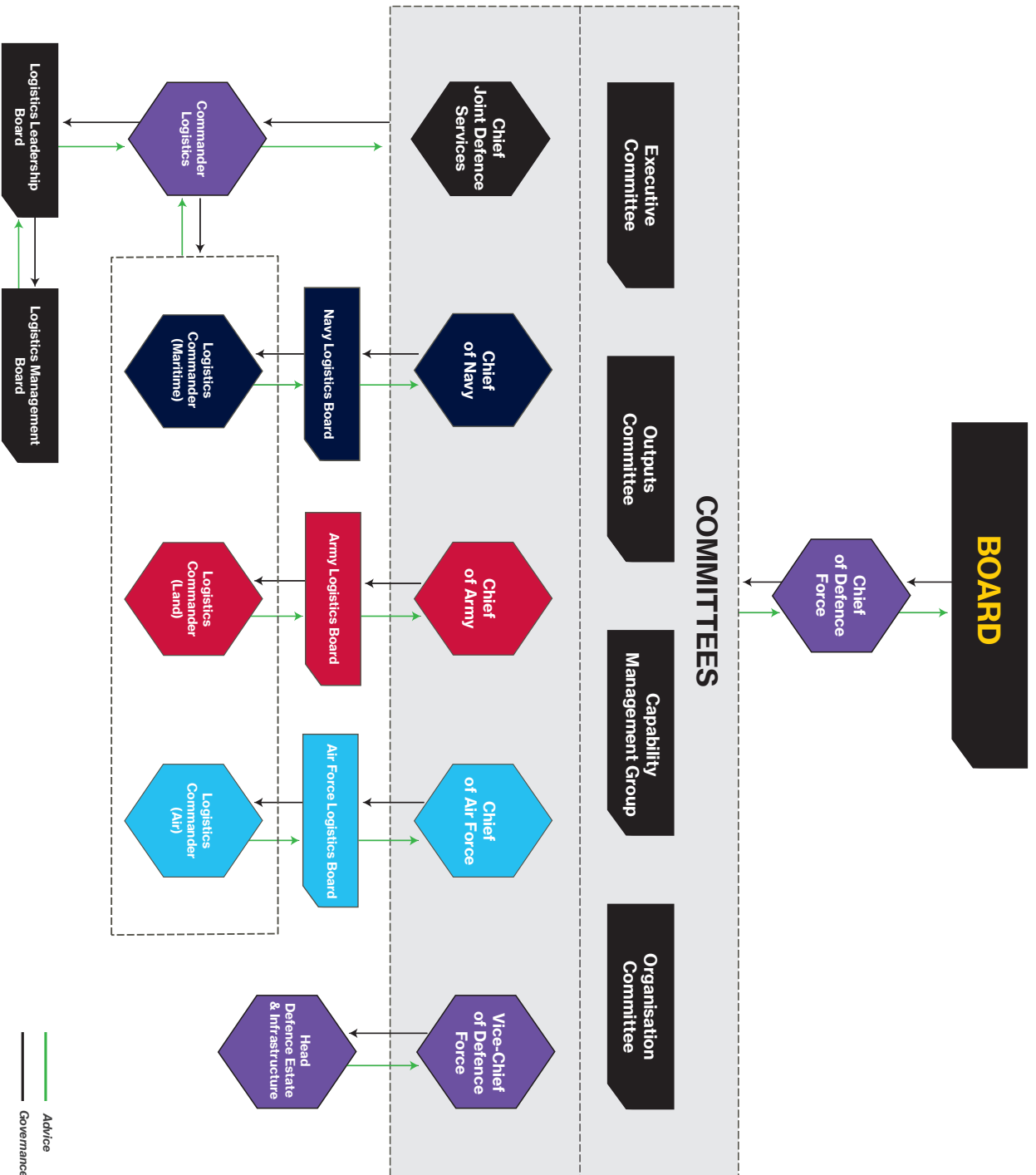


Figure 4-1: Governance relationships.

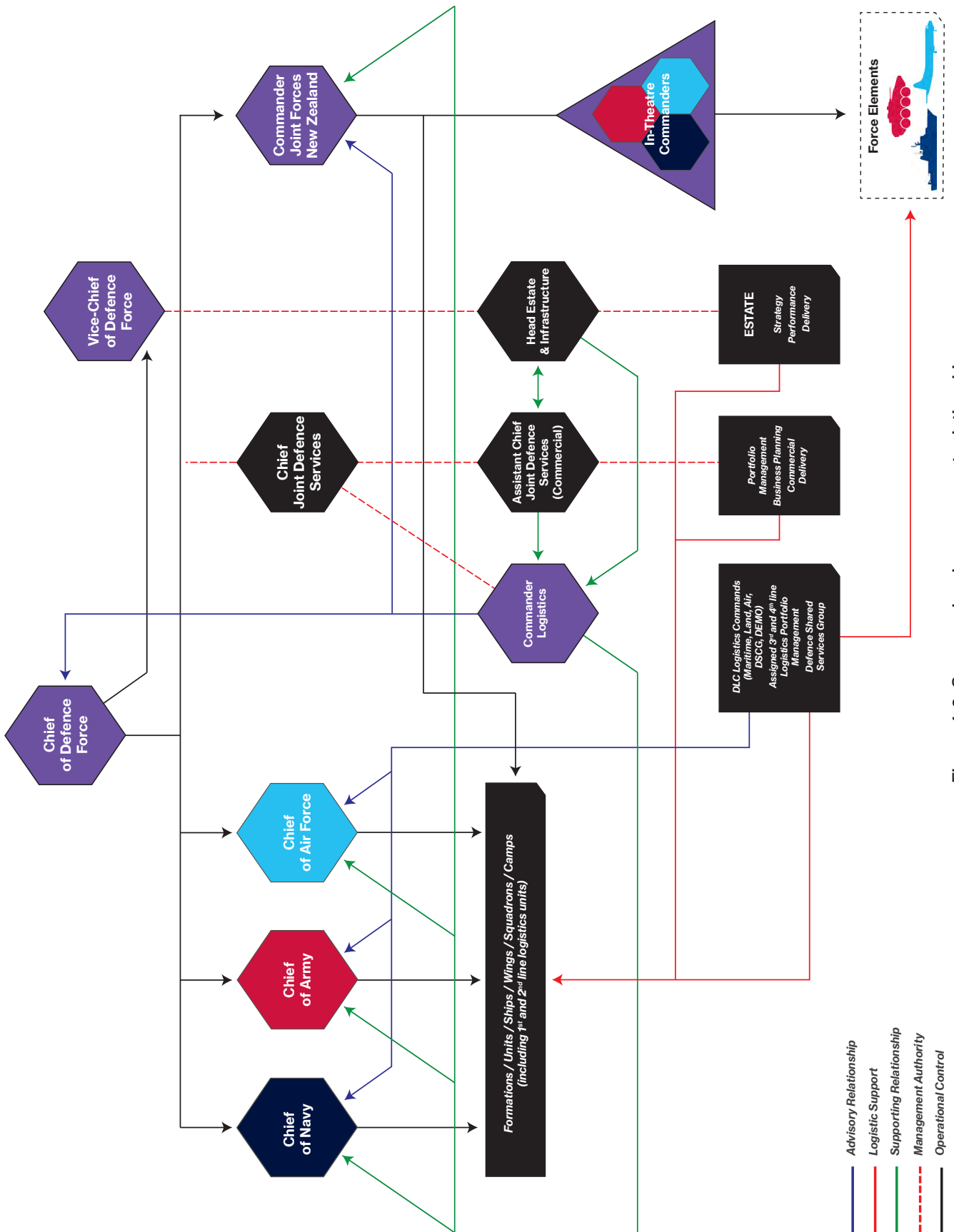


Figure 4-2: Command and management relationships.

## Principal Logistics Commanders and Managers

### Chief of the Defence Force

4.15 As commander of the NZDF, CDF is supported by the Vice Chief of the Defence Force (VCDF), COMJFNZ, the Service chiefs, and COMLOG in executing his logistics command functions. Logistics is a function of command, and therefore ultimate responsibility for the provision of logistics support rests with CDF, who relies on COMLOG for logistics advice. Much of what CDF is responsible for has logistic implications or is directly related to logistics. This includes:

- planning and conduct of military operations
- preparedness of the NZDF including its organisation, manning, training, and logistic support
- raising of forces
- maintenance of standards of health
- considering political, financial, or legal constraints on the use of military force, with particular regard to alliance or multinational force partners
- directing forces and resources to be assigned.

### Vice Chief of the Defence Force

4.16 VCDF is the military deputy to CDF and acts as CDF in when CDF is absent. VCDF is the joint capability manager. This includes managing joint capabilities and providing input to joint capability development. VCDF's logistics responsibilities include defence estate and infrastructure.

### Chief Joint Defence Services

4.17 CJDS areas of logistics accountability include DLC and defence commercial service (DCS). CJDS leads and influences all aspects of consolidated logistics support to deliver NZDF military outcomes.

### Service Chiefs

4.18 The Chief of Navy, the Chief of Army, and the Chief of Air Force command their respective Services in accordance with Section 9 of the Defence Act 1990. They are CDF's principal military advisers on defence policy, military strategy and the employment of their Service. As with CDF, the Service chiefs have significant logistic responsibilities. The Service chiefs are the principal capability managers within the NZDF organisation, whose roles are to raise, train, and sustain in-service capabilities. In particular, the Service chiefs are responsible to CDF for the preparedness of their Service force elements.

### Commander of Joint Forces New Zealand

4.19 CDF may elect to command operations directly. However, CDF will normally exercise command of NZDF operations through COMJFNZ. COMJFNZ commands Headquarters Joint Forces New Zealand (HQJFNZ) in order to plan, control, and conduct campaigns, operations, joint exercises, and other activities on behalf of CDF. CDF directs the Service chiefs to assign forces, including logistic forces to COMJFNZ for operations. Once logistic forces have been assigned, COMJFNZ becomes responsible for the logistic support required to achieve the designated mission. Within HQJFNZ, this responsibility is delegated to the J4 HQJFNZ who ensures that the logistics system from the national support area (NSA) into the theatre of operations is functioning as required. As there is no doctrinal template for C2 of logistics in support of operations, J4 HQJFNZ in consultation with COMLOG will tailor the logistics C2 to suit the operational circumstances.

4.20 COMJFNZ may elect to appoint a logistic component commander (LOGCC). The LOGCC would command and control logistics operations in the joint forces area of operations (JFAO). The decision to do so will normally depend on the environment, scale, and complexity of logistics support required.

## Commander Logistics

4.21 COMLOG is the NZDF Strategic J4 and the commander of DLC. Through this combination of roles COMLOG is a critical influencer of NZDF strategic logistics outcomes and can enable and implement logistics strategies and plans through the 3<sup>rd</sup> and 4<sup>th</sup> line organisations that make up the DLC.

4.22 **Strategic J4.** As Strategic J4, COMLOG is the senior military officer accountable to the CDF, through the CJDS, for the management of support to the operational delivery of joint logistics capability, oversight, and assurance of the logistic capability. The Strategic J4 role is to shape the delivery of logistic capability and streamline and simplify common logistics activities through:

- development of logistics policy, strategy, and doctrine
- logistic planning at the strategic level
- providing integrated logistic support advice to the CGB and capability working groups (CWG)
- strategic relationship management of logistics contracts
- oversight and technical control of overseas procurement offices
- sponsorship of logistic information systems development
- co-ordination of international logistics support capabilities and agreements.

4.23 **Commander of Defence Logistics Command.** As the head of DLC, COMLOG is accountable to the Service chiefs and COMJFNZ, through CJDS, for the provision of operational level support to force elements and operational commanders, tactical logistics supplementation, and for the provision of garrison and shared services support to all NZDF camps and bases.

4.24 To meet the operational level support requirements, the DLC through three environmental

logistics commands (maritime, land, and air) and two functional organisations – the directorate of supply chain management and the equipment management organisation plan – coordinate and provide in a consolidated approach:

- maintenance, repair, and overhaul (MRO) services
- non-platform equipment management
- class 1-9 materiel
- contingency reserve stock
- warehousing and distribution services
- disposal services
- logistics information management support services
- materiel codification services
- oversight of the NZDF supply chain
- contributing to logistic planning at the operational level
- technical control of logistics units that provide forward support and combat service support.

4.25 At the tactical level of logistics, the DLC may also provide support to HQJFNZ by supplementing defence support units, national support elements (NSE), and force extraction and insertion teams (FIET) with any deployed personnel and expertise.

4.26 The provision of non-deployable logistics and shared services support is undertaken by the defence shared services group (DSSG). DSSG delivers this function through service centres across NZDF. The key logistics activities provided by DSSG include:

- travel and claims services
- administration domestic vehicle services
- accommodation, barrack, and defence housing services
- non-operational hospitality and catering services
- registry and mail services

- administration and control of mobile devices and technology
- identity and security passes
- administration of shared facilities and infrastructure.

### Assistant Chief Joint Defence Services (Commercial)

4.27 The Assistant Chief Joint Defence Services (Commercial) is responsible to CJDS for the management and oversight of DCS. DCS are the focal point for all procurement, purchasing, and contracting support within NZDF and through the commercial portfolio, business processing and commercial delivery groups:

- develops and maintains NZDF procurement policy
- facilitates the procurement of equipment, material, and services required by the NZDF, and not undertaken by the MoD
- provides support and oversight for the NZDF procurement strategy for goods and services
- provides support and oversight of NZDF contract and vendor management
- conducts tendering, evaluation, and contract preparation in support of sponsor or their delegates for all procurements not undertaken by the MoD
- authorises all NZDF purchase delegations as sub-delegated by CDF
- provides technical oversight of the commercial activities of the Defence procurement offices
- undertakes the accounts payable function
- acts as the principal NZDF relationship manager with the New Zealand Government Procurement and Property Branch in Ministry of Business, Innovation, and Employment (MBIE).

### Head Estate and Infrastructure

4.28 The HDEI is responsible to VCDF through functional managers for the strategy, performance and delivery of the defence estate.

4.29 The General Manager of Estate Strategy is responsible for:

- developing estate and infrastructure strategic plans and programmes to initial business case level
- relationship management and engagement with single Services and portfolios (including representing estate and infrastructure at the CSG)
- development and execution of estate and infrastructure strategy (including strategic asset management, NZDF tenure, and estate people strategy)
- development and maintenance of estate and infrastructure policy.

4.30 The General Manger of Estate Performance is responsible for:

- delivering and coordinating a portfolio/programme/project approach for estate and infrastructure with a focus on benefits planning, capacity planning, and resourcing
- developing and executing an estate and infrastructure information management strategy, including defining information needs and providing analysis support and advice to inform NZDF investment and decision making
- developing and implementing an ongoing business improvement programme, business excellence, and innovation across the estate and infrastructure organisation.

4.31 The General Manager Estate Delivery is responsible for:

- programme/project development and construction delivery, including user requirement analysis option development, design, cost planning, and execution

- specialist environmental advice, policy and delivery of services including resource consents, outline plans, management of contaminated sites, and heritage places
- estate health and safety and compliance activities
- asset management, conditional assessment, and planning
- facilities management including oversight and coordination of all base and camp maintenance activities, soft service, and energy management.



CHAPTER 5:

# THE LOGISTICS SYSTEM



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## Introduction

5.01 In Chapter 1, the nature of logistics was described as a multidimensional and complex entity that has continued to evolve throughout history. This is because logistics spans the strategic, operational, and tactical levels of command, and extends from commercial partners, through the national support area (NSA) to the foxhole. Logistics is geographically dispersed, multifunctional, and organisationally diverse, being found throughout the New Zealand Defence Force (NZDF), the single Services and the joint environment. The local and international commercial sectors also make a substantial contribution to the NZDF.

5.02 It is recognised that such a diverse and complex entity may not be easily or simply described and understood. It helps our understanding to note that NZDF logistics is united around a single purpose: to generate and sustain the operational preparedness of the NZDF, support the employment of those forces by providing robust, agile, flexible, and focussed logistics, and strive to optimise what is

collectively available across the NZDF and commercial partners. It is by developing an understanding of the entire logistics system and its component parts that universal issues such as logistics command, management, control, and information systems can be designed and improved.

## Logistics Systems of Systems

### Overview

5.03 The logistics system is populated by related entities (that is, members of the NZDF commercial logistics community, which are functionally as well as structurally related) that work together to achieve shared goals. The logistics system is perhaps most easily recognised as the physical entity that provides support to operations and extends from the NSA along lines of communication to an operational theatre. However, this is only one manifestation of the logistics system and does not provide a complete picture. From a systems perspective, defence logistics consists of many interconnected and interrelated

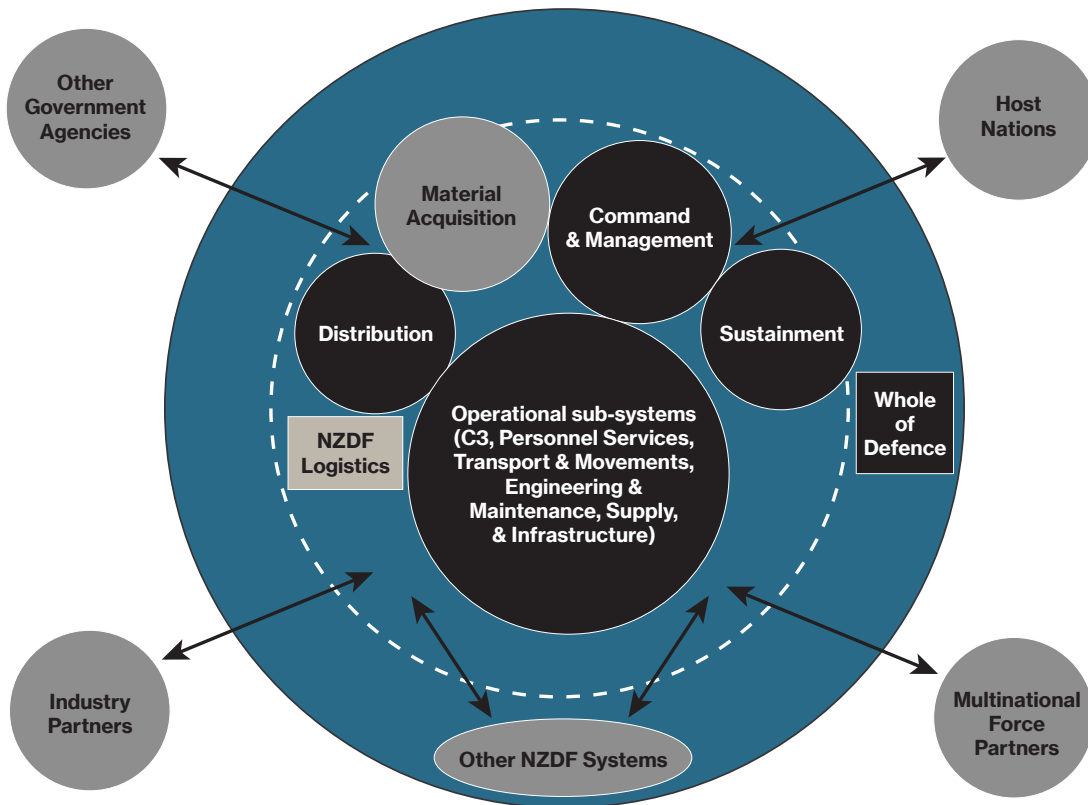


Figure 5-1: The New Zealand Defence Force logistics system.

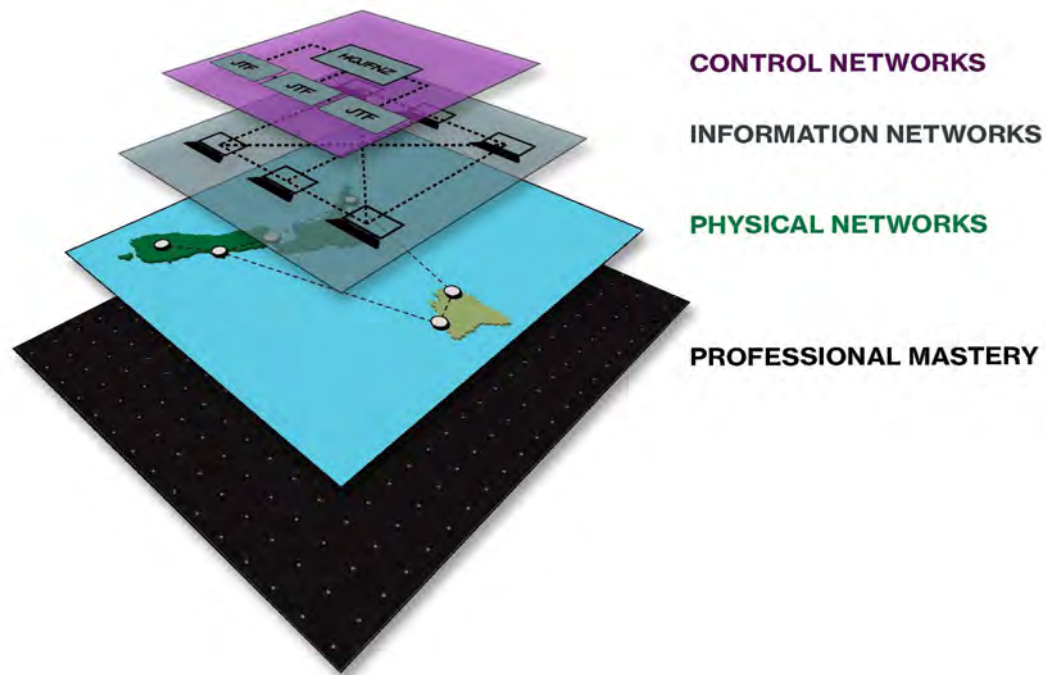


Figure 5-2: Logistics networks.

sub-systems that each contribute to the functionality of the entire system and its outputs. Sub-systems are functional entities that typically consist of personnel, organisations, processes and materiel. Figure 5-1 provides an illustration of the NZDF logistics system and its major sub-systems.

5.04 The NZDF logistics system is an open system. All logistics sub-systems are interconnected, and information, data and products can flow freely within, into and out of the system to and from other systems. For example, logistics sub-systems can interact with other NZDF systems or extend beyond NZDF to other government agencies, industry partners, coalition partners, and host nations.

5.05 At the heart of the logistics system are the operational subsystems – those functions that are usually organic to or assigned to a joint force for the conduct of an operation, and include command, control and communications, personnel support services, transport and movements, materiel engineering and maintenance, supply, and infrastructure engineering and maintenance. The generic logistics functions are listed in Chapter 1. The other major subsystems are:

- command and management, which extends across the entire system

- acquisition, which includes the needs, requirements, and acquisition phases of the capability life cycle
- sustainment, which is the provision of resources necessary to support operations and achieve preparedness, and includes the in-service and disposal phases of the capability life cycle
- distribution, which is the means by which logistics support is delivered to the users and includes transport, warehousing, inventory management, and control.

## Logistics Networks

### Introduction

5.06 Another perspective of the NZDF logistics system is obtained by considering logistics as existing in three distinct areas: the control networks, the information networks and the physical networks (see Figure 5-2). The control networks enables commanders and managers to decide, direct, and exercise control in order to achieve visions, missions, end states, outcomes, goals and objectives. The connectivity provided by the information networks allows logisticians to share access and protect

information within the system, and develop their situational awareness of situations internal and external to the system. In the physical networks, the logistics system is allocated people, equipment, resources, and locations to complete the tasks directed by commanders and managers. This perspective is based on the premise that professional mastery is essential to the capacity of NZDF logistics to function effectively, and therefore professional mastery forms the foundation of the logistics networks.

5.07 Understanding this system allows us to comprehend the strengths and vulnerabilities and how to build more robust systems in the future. It also aids an understanding of an adversary's logistics system and how best to disrupt it. Systems that do not have strong linkages between control, information, and the physical, or are too dominant in one area to the detriment of the others, will struggle to function effectively and are more easily targeted by an adversary.

## Control Networks

5.08 The control networks includes the command and management architectures, logistics organisations and agencies, and the legislation, policies and procedures necessary to direct, standardise and regulate logistics operations. It includes military command and control, assigned force elements and standing operating procedures, and NZDF civilian management, organisations and procedures. Logistics controls provide commanders and managers with mechanisms to achieve those visions, missions, end states, outcomes, goals, and objectives that have been specified to them by the chain of command or derived by them.

5.09 **Commanders and Managers.** The authority conferred on commanders and managers to direct logistics operations is the basis of the control networks. It is essential that there is no ambiguity associated with the assignment of authority, responsibility, and accountability for logistics

operations and the allocation of logistic resources. Logistics commanders and managers are rarely solely responsible for logistics operations as they are normally acting in support of another commander who has overall responsibility. A major control focus for logistics commanders and managers is the effective use of limited resources. This involves anticipating requirements, allocating appropriate resources to achieve required levels of support in accordance with operational priorities, dealing with uncertainty and managing logistic risks. These matters are addressed in consultation with the operational commander.

5.10 **Controls.** The control networks is not a constraint on logistics operations. Rather, the control networks puts into practice procedures that are known from experience to be effective and compliant with legislation and NZDF logistics and finance policies. Planning is a prominent logistics activity in the control networks as it has a strong procedural basis, generates courses of action that meet the higher commander's intent, and provides the information needed to synchronise logistics with other activities and monitor the performance of logistics tasks. Consistent with its predominantly scientific nature, logistics is a relatively highly regulated military activity. Some of the controls logisticians are required to comply with include:

- national and international laws
- technical regulations
- financial arrangements and accounting regulations
- international arrangements and agreements covering logistics sharing and offsets between New Zealand and other nations
- Ministerial directives, Government procurement guidelines
- Defence Force orders, which cover a range of logistics matters.
- international standards governing the provision of logistics support
- commercial contracts between NZDF and industry providers.

### 5.11 Procedures and Operating Methods.

The control networks includes those procedures and operating methods that activate the NZDF logistics system and its sub-systems. Most logistics procedures and methods have a basis in doctrine and are recorded in manuals, handbooks, and standing operating procedures.

5.12 Commanders can establish broad controls over logistics systems in support of operations by specifying the method to be adopted. The two basic methods of operating a logistics system are the push method and the pull method.

- **Push.** When consumption is predictable, such as when operations are routine or following well-established patterns, or when forward units have a capacity to receive and store surplus supplies, logistics support can be allocated or 'pushed' through the system. The push method keeps units topped up to predetermined levels and is less concerned with just-in-time support and more concerned with just-in-case support. The push method may also provide levels of support that may be in excess to immediate requirements, such as medical facilities. The push method requires minimal control, although overburdening forward units with excessive stockpiles should be avoided. The push method minimises risk.
- **Pull.** The pull method operates on the just-in-time principle and relies on the forward units calculating and requisitioning or 'pulling' support. Implementation of the pull method is dependent on excellent visibility of forward support requirements, and requires a supply and distribution system that is responsive to surges in demand. The pull method requires detailed control mechanisms both forward and in the rear to ensure that any risk of shortfalls occurring is mitigated.

## Key Terms

### Push

When consumption is predictable logistics support can be allocated or 'pushed' through the system.

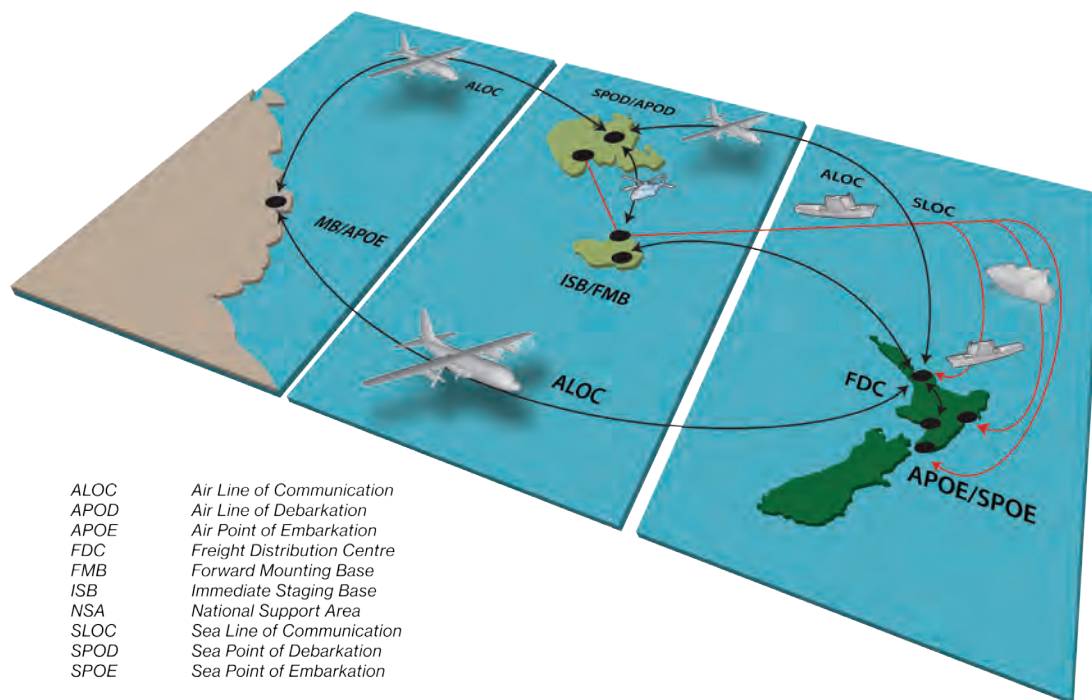
### Pull

The pull method operates on the just-in-time principle and relies on the forward units calculating and requisitioning or 'pulling' support.

5.13 Related to the push and pull methods are the control methods employed to deliver support to forward units.

- **Supply Point Distribution.** With this method, resources are staged at a logistics node and the supported unit comes to that node to obtain supplies or services. The receiving unit is responsible for transport to and from the node. This method is generally efficient but places a significant transport responsibility on the supported unit.
- **Unit Distribution.** With this method, supplies and services are delivered to the supported unit by the supporting logistics organisation. This method is generally more responsive to the needs of the forward units but requires the dedication of significant transport assets.

5.14 In practice different combinations of the methods described above will be used during the course of an operation or campaign. The unpredictability, chaos and friction of war require logisticians to optimise the performance of the logistics system employing whatever control methods are appropriate to the situation at hand. Logisticians need to anticipate, adapt and retain flexibility in the systems they construct.



**Figure 5-3: Physical networks – nodes and modes.**

### Information Networks

5.15 The logistics information networks contains a myriad of information systems that are facilitators to both the physical and control domains. Information systems provide a means to gain visibility of logistics operations, resources and support arrangements, and enable the control of the provision of support. Information systems also provide decision support tools to assist in planning and to measure and monitor logistics system performance. By having appropriate information, logisticians can provide informed advice, assess and manage risk, measure system performance and make decisions regarding matters such as priorities of effort, inventory holdings, maintenance and distribution schedules and task requirements.

5.16 The NZDF logistics systems take advantage of the developments in capability of modern communications and information systems. Information technology has enhanced the collection of usage data, the tracking of assets, and the processing of requirements, providing more detailed and accurate

information upon which to base plans and decisions and enabled greater responsiveness.

5.17 The NZDF's logistics capitalises on information systems that enable the transfer of information much more rapidly and in a manner that can update all nodes within the system simultaneously, transcending traditional command and control hierarchies. There are limits on the amount of information that humans can process and the increased availability of information may make controlling the logistics system more complex. Information needs to be managed, filtered and prioritised by the staffs so that commanders and managers do not become overwhelmed or distracted by details. In addition, information system facilitators such as bandwidth capacities are finite and require careful management to ensure priority information is able to be disseminated freely and in a timely manner.

5.18 Whilst the information networks offers many advantages to the logistician care must be taken to ensure the system is not deliberately or inadvertently compromised. Security staff assist logisticians in

assessing this risk through system CIS certifications, security clearances, a security culture, and insider threat programmes. Counter-intelligence staff also assist logisticians by identifying the threat and recommending mitigations for vulnerabilities.

## Physical Networks

5.19 The physical networks includes the resources and installations required to provide logistics services. The physical domain includes geographic locations, encompassing the national support area (NSA), international support sources, deployed logistics nodes, modes of transport and movement between nodes and the personnel and equipment resources required to operate the nodes and modes.

5.20 The physical networks is fundamentally concerned with the generation or receipt of support, the movement of support to and from the location at which it is required and the disposal or salvage of resources. The physical networks consists of the following:

- logistics nodes are locations at which resources are acquired, maintained, stored, and moved from one mode to another
- transport modes are the physical means of moving materiel and personnel between nodes (as illustrated in Figure 5-3).

5.21 **Nodes.** Nodes provide anchor points for the logistics system. Nodes provide points at which support is generated, acquired, maintained, stored, and/or distributed. Nodes are establishments for the provision of services, maintenance of equipment, medical treatment of personnel, assembly, and redistribution of assets and transport transition points from one mode of transport to another. Nodes can be simple caches or dumps to complex facilities such as maritime logistics bases (for example, a maritime node formed by one or more ships that provides support to an amphibious landing force). Nodes can be mobile or static.

## Key Term

### Node

The point at which resources are acquired, maintained, stored, and moved from one mode to another.

5.22 The major forms of nodes include the following.

- **National Support Area.** The NSA comprises all permanently established military bases located within New Zealand territory, New Zealand national facilities that are used by NZDF (such as ports, airports, and rail heads) and civilian establishments that are contracted to support Defence. For operational planning purposes it is considered as a single nodal entity. The NSA may include temporary bases such as mounting bases and points of embarkation that are superimposed over a permanent facility to support a particular operation or campaign. Such bases may require a surge in the capacity of the permanent base to provide support.
- **Forward Bases.** In order to reach a remote theatre or area of operations, forward bases may need to be established along the lines of communication and outside the operational theatre. Types of forward bases include intermediate staging bases and forward mounting bases.
- **Deployed Bases.** Logistics bases established within an operational theatre are deployed bases. Types of deployed bases include points of disembarkation and forward operating bases. They include bases that may provide a wide range of logistics functions through to simple nodes for the exchange or transfer of stores from one mode to another. These latter nodes may only need to exist for relatively short periods.
- **Sea-bases.** Maritime vessels can be used as afloat bases in support of amphibious or land operations. Ships can serve both as a mode of moving supplies into the theatre of operations and as mobile nodes



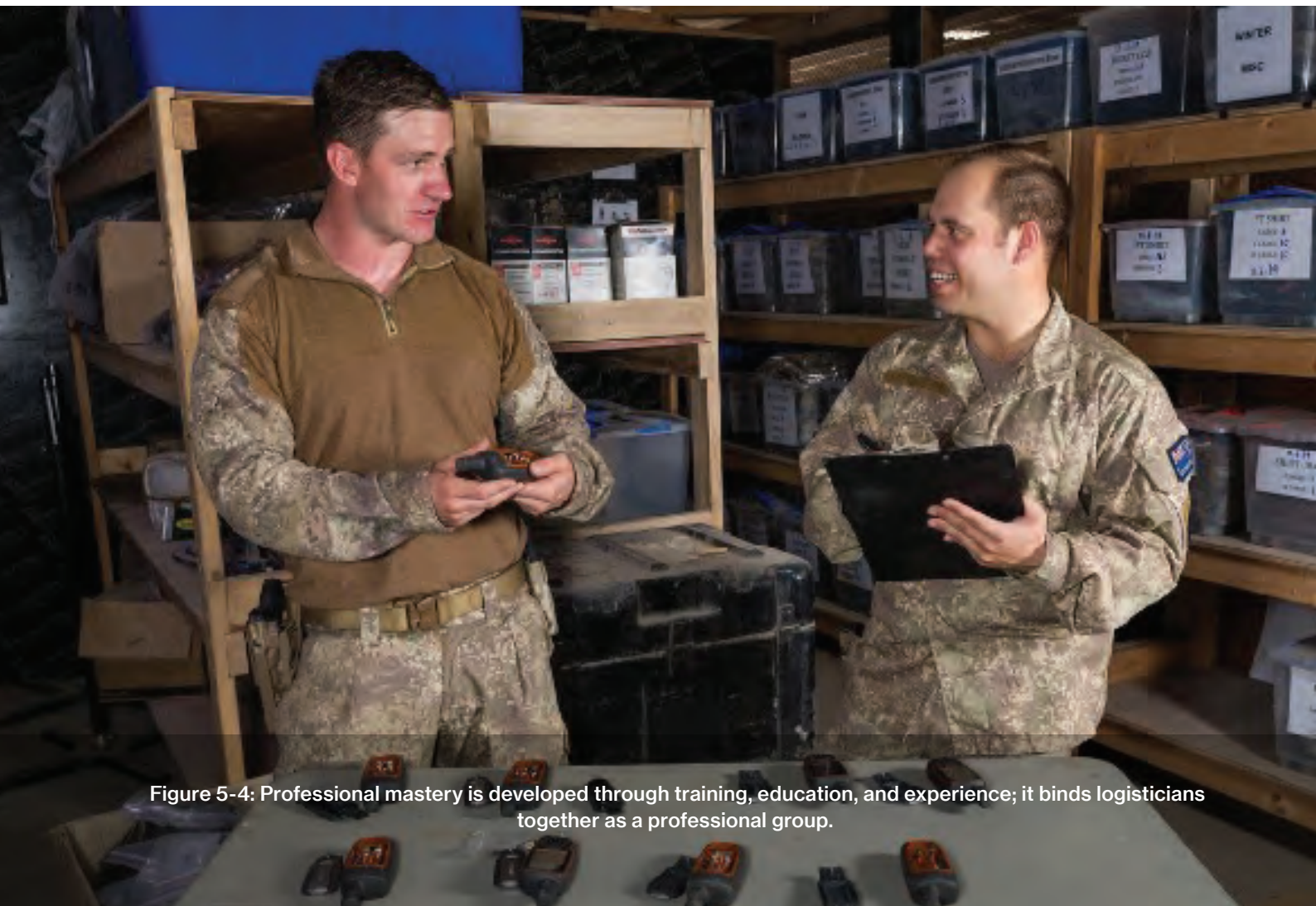


Figure 5-4: Professional mastery is developed through training, education, and experience; it binds logisticians together as a professional group.

for resupply within that theatre. Certain ships can also provide health facilities, maintenance capabilities, fresh water, accommodation, and messing.

5.23 **Modes.** The links between nodes are called modes and refers to the forms of transport to move support. The major transport modes include road, rail, air, water, and pipeline. Modal links can vary from simple structures with few modal connections through to complex networks involving multiple modes. The type of links established depend on the availability and capacity of transport resources, distances between nodes, the modal redundancy required and the control mechanisms in place. The major modal routes linking nodes within the NSA and between the NSA and a theatre of operations are known as lines of communication.

## Key Term

### Mode

The physical means of moving materiel and personnel.

## Professional Mastery

5.24 Professional mastery is an expression of how individuals apply their skills, knowledge and attitudes to their tasks. It is developed through training, education, and experience, and binds logisticians together as a professional group. Professional mastery covers a range of issues, of which the key elements are as follows.



Figure 5-5: Logistics knowledge is information that is gathered through operational lessons and reports.

- **Doctrine.** Logistics doctrine provides the intellectual basis for the military profession that is logistics. Doctrine guides logistics thinking without constraining it, and looks to the future.
- **Education.** Logistics education is guided by doctrine and addresses the enduring aspects of the profession. Logistics education may be provided by the NZDF and civilian education establishments.
- **Training.** Training is derived from the specific requirements of the workplace and prepares individuals and logistics teams for their jobs. Training conducted in logistics training establishments and in the workplace provides individuals with the necessary proficiencies required of their employment, including competency-based qualifications, licences,

experiences relevant to their employment streams and skills.

5.25 **Organisational Knowledge.** Logistics organisational knowledge is generated continuously by the logistics community and informs the continuous development and improvement of the NZDF logistics system.

5.26 **Logistics Knowledge.** Logistics knowledge is information that is gathered in various forms such as operational lessons and reports. Much of the logistics knowledge obtained is applied almost immediately at the tactical level to address specific issues that have arisen. Leveraging knowledge involves disseminating knowledge, subjecting it to further analysis from a range of perspectives, and using that analysis to advantage. Leveraging is particularly concerned with

identifying gaps between current system performance and future logistics system performance, and applying knowledge to address those gaps.

5.27 Effective application of logistics knowledge requires the active involvement of people who research and analyse logistics knowledge from their various perspectives and apply that knowledge. The utility of logistics knowledge is dependent on the quality and quantity of information recorded. In an organisational sense, logistics knowledge consists of a number of components. These components are outlined below.

- **A framework** of NZDF logistics goals and objectives, which is contained in logistics, policy, doctrine, concepts, and business plans.
- **A culture** of wanting to learn, evaluate systems performance, apply lessons, and use doctrine. The logistics learning culture is fostered during training and in the workplace and is a command and management responsibility.
- **Incentives** that promote the routine use of logistics knowledge. Incentives include directives, orders, and instructions that promote use of logistics knowledge.
- **People and processes.** The active involvement of people in leveraging knowledge invigorates logistics knowledge, supported by processes that facilitate effective use of knowledge.
- **Information systems** and their inbuilt processes. Logistics information systems ideally will have integral sub-systems that enable users to capture, receive, store, collate, retrieve, and disseminate logistics knowledge to other users.
- **Networks and logistics communities** that take a special interest in logistics knowledge and promote its use.
- **Champions and advocates** are needed throughout the NZDF logistics community (commanders and managers have a particular responsibility in this regard).



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CHAPTER 6:

# LOGISTIC SUPPORT TO CAPABILITY



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## Introduction

6.01 Military capability goes beyond equipment. Rather, it includes all necessary components that, together, enable a military force to successfully achieve an operational objective or task. In the New Zealand Defence Force (NZDF), the elements by which the military capability of a force is measured are preparedness and the components described by PRICIE acronym. This parts of this acronym stands is displayed in Figure 6-1.

6.02 The components of capability and their relationship to Logistics are as follows.

- **Personnel.** Capability is delivered through people who are the sole component of capability with the intrinsic ability to generate value. Logistics is a defence profession. It requires trained and educated NZDF personnel and NZDF civilians to command, manage, supervise and deliver logistic support. Logisticians fall into two broad categories: specialists and generalists.
  - Logistics specialists have proficiencies in at least one logistics discipline, including personnel support services, transport and movements, integration and configuration, materiel engineering and maintenance,

supply and infrastructure engineering, and maintenance.

- Generalists, in addition to their specialist knowledge and experience, have general knowledge of logistics, including managing and understanding the logistic system, logistic planning, and logistic policy and processes. Generalists have a broad understanding of most logistic disciplines. Logistic commanders and managers are expected to be logistic generalists. Logistic specialists and generalists are further defined in terms of their employment environment, including joint and single Service.
- **Research and Development.** Research and development (R&D) is the 'engine for change' in the continual modernisation of the NZDF. The NZDF must be a smart buyer and user of technology to ensure that it maximises the effectiveness of its limited assets, and keeps them interoperable with other nations' forces. It is important the NZDF remain abreast of future technology trends and how they will impact upon future capabilities required.
- Research in and subsequent development of NZDF current and future forces are conducted in concert with the defence technology agency (DTA). DTA also assists in the analysis of data gathered in the



Figure 6-1: The components of capability.

course of NZDF activities to assist in the evaluation of extant logistic processes.

- **Infrastructure and Organisation.** Infrastructure includes buildings, structures, property, plant equipment, and areas for training and other purposes – exercise areas and firing ranges, for example.
  - Logistic organisations have been established to be responsive to their immediate customers and contribute to the wider defence logistics system. Logistic organisations are found within the defence environments (for example defence logistics command) and the single Service environments (for example logistic units organic to manoeuvre forces). All of these organisations are integrated into the logistics organisation through the system of systems approach, and whilst they have particular organisational alignment (for example to a single Service) they are linked by the defence logistics system, as are the logistic elements of non-logistics organisations.
- **Concepts, Doctrine, and Collective Training.** Concepts are the way in which we think the NZDF will operate in the medium- to long-term future. They have been developed in response to either changes in the strategic or security environment or emerging technology. Doctrine represents what we know works. It provides the fundamental principles guiding the operations of military forces, or elements thereof, in support of national objectives.
  - Collective training applies laterally across combined, joint, and single-Service elements, and vertically down to unit levels. To enhance performance, organisational elements must undertake a comprehensive and ongoing collective training regime validated against the detailed preparedness requirements derived from government guidance.
  - Logistics is not usually given priority within the collective training program, as it is anticipated that logistics will train in concert with manoeuvre force elements. Whilst this is the case, there are limitations on the full achievement of logistic collective training

objectives within wider collective training activities. These limitations are related to the cost and time. Given these limitations, computer-simulated logistics provides an important mode of relatively unconstrained collective training.

- **Information Technology.** Communications and information systems are an essential part of military operations that provide commanders at all levels with the means to exercise command and control and disseminate vital information. Information management includes the systems – system architecture, hardware, and software – required to support the NZDF's operational and non-operational activities. Information is a key facilitator that underpins all
- **Equipment and Logistics.** Equipment includes all major platforms and weapon systems including, but not limited to: ships, armoured vehicles, aircraft, missile systems, major electronic systems, and the myriad sub-items required to operate and support these platforms and systems. Supplies and services include the logistics support and supply chains required to support military capability.

## Key Term

### Military Capability

Military capability is the ability to achieve a desired operational objective in a selected environment and to sustain that level of effort for a designated period. It is the combined effect that systems of inputs have in helping to achieve a particular operational consequence.

### Capability Management

6.03 The process of generating, sustaining and disposing of capabilities is called capability management. Capability systems have a life cycle that begins with the identification of the need to address a current or prospective capability gap. This need is progressively translated into a working capability system that is operated and supported until it is ultimately withdrawn from service.



6.04 The responsibilities for managing the phases of the capability life cycle are dispersed and usually shared. Capability managers (CM) play an important contributing role, and sometimes the primary role, at all stages of the capability life cycle. The principal CMs are the following.

- Chief of Navy (CN) for maritime force capability management
- Chief of Army (CA) for land and special forces capability management
- Chief of Air Force (CAF) for air force capability and airworthiness management
- Vice Chief of the Defence Force (VCDF) for joint capability management
- Chief Joint Defence Services for the defence information environment capability management
- Chief Defence Intelligence (CDI) for joint (non-single service) defence intelligence capability management.
- Commander Logistics (COMLOG) as the Strategic J4 for joint logistics capability management. From a logistics perspective, greater emphasis is being placed on 'Equipping the Force' by pooling equipment that comprises capability. This aims to:
  - create greater efficiency and utilisation of equipment
  - avoid incurring future costs thereby making the defence capability plan more affordable
  - enable force elements to be better prepared for and supported on operations
  - improving combat equipment availability and accessibility
  - reducing logistic workload and freeing up capacity
  - ensuring equipment is fit for purpose, safe and available in the right place at the right time
  - providing greater confidence in logistics planning.

### Capability Management Life Cycle

6.05 The capability management life cycle is divided into six phases all of which have a logistics component (see Figure 6-2).

### Policy and Strategy Phase

6.06 The first phase of the capability life cycle is policy and strategy. It provides three important strands of information for capability planners. The principle elements of this phase are detailed as follows.

- **Policy.**
  - **Defence Assessment.** This examines the strategic outlook and implications for New

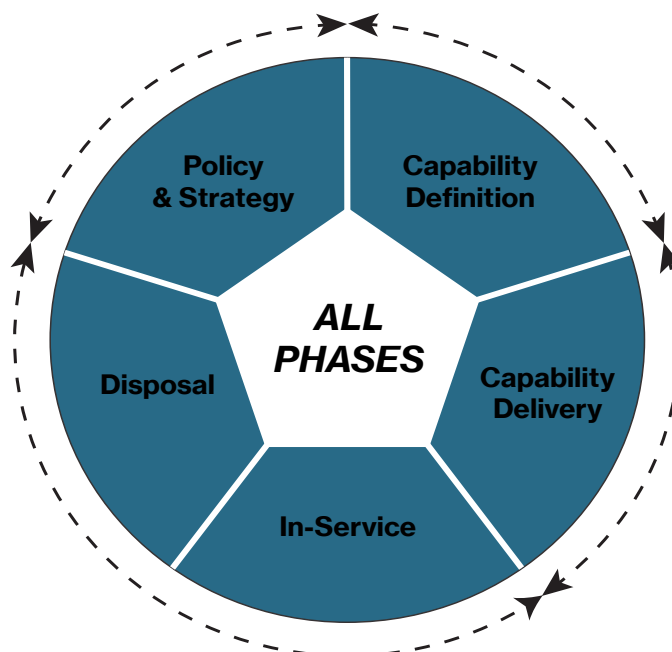


Figure 6-2: Capability Life Cycle.

Zealand. This results in policy advice submitted to government by the Secretary of Defence in consultation with the Chief of Defence Force (CDF).

- **Defence White Paper** (or equivalent). This is led by the Secretary of Defence, this document is a public expression of the government's defence policy goals, matched to a future strategic environment.
- **Defence Capability Plan.** This describes the capability sets needed to deliver the government's defence policy as described in the Defence White Paper.
- **Strategy.**
  - **Future Operating Concept.** The future operating concept (FOC) is approved by VCDF. It explains the NZDF could conduct operations in the future to meet government policy objectives. It provides conceptual, force, and capability modernisation guidance, and is subject to a rigorous experimentation and validation process before concepts are considered as future capability options.
  - **Long Term Investment Plan.** The long term investment plan (LTIP) sets out how Defence intends to deliver the investments in the defence capability plan and the defence capital plan. The LTIP outlines the indicative capital allocated over financial years, the timing of investment decisions, and the benefits and outcomes expected. It also describes the processes and tools used to advise Ministers on planned investments, and to effectively deliver approved investments.

## Capability Definition Phase

6.07 The purpose of the capability definition phase (CDP) is to identify in a methodical and rigorous way, the capability options available to the NZDF to achieve a desired effort or outcome. This is achieved by undertaking two high level processes:

- system capability definition
- individual investment/project capability definition.

6.08 The results of this phase should:

- represent value for money
- provide force structure coherence
- provide options that reflect current and validated capability concepts
- provide for capability investment that can be successfully delivered and operated in a sustainable way.
- deliver a security plan to protect the capability through its life of type.

6.09 The Secretary of Defence ordinarily leads and is accountable for the Capability Definition phase, in collaboration with the CDF.

## Capability Delivery Phase

6.10 Capability delivery comprises three high level processes:

- source and integrate the new capability
- manage acquisition and verify the new capability
- manage integration and validate the new capability.

6.11 The CDF ordinarily leads and is accountable for the capability delivery phase, in collaboration with the Secretary of Defence.

## In-Service Management Phase

6.12 The in-service phase of the capability life cycle is the period of time where a capability is used for its intended purpose by the end user. It is the phase where the original user requirements are fulfilled and the promised benefits are realised. During 'In Service' the following key activities occur:

- project activity is completed and the project is closed
- the capability is operationally released
- the capability is utilised to deliver outputs as

agreed with government and the agreed benefits are realised

- information is fed back to inform processes within the capability definition and policy and strategy phases.

6.13 CDF ordinarily leads and is accountable for the 'In Service' phase, in collaboration with the Secretary of Defence.

## Disposal Phase

6.14 Planning for disposal is instigated in the capability definition phase in accordance with the Capability Management Plan(s) and is undertaken throughout the life of a capability.

6.15 A project is established to undertake the disposal once disposal is pending. A disposal project follows the same process used for the development of a new capability, with acquisition activities being replaced by disposal activities. PRICIE is considered when developing the project brief, concept of disposal, and disposal implementation plan.

6.16 In addition to any arms control and environmental legislation, regulations and international accords that may need to be satisfied, approval from the country of origin and / or manufacturer may also be required before disposal. Compliance is required with original acquisition conditions such as end user certificates (EUC), export licenses (for example USA:DSP 5), FMS case numbers or non transfer agreements (for example USA:DSP 83).

6.17 In accordance with Cabinet Circular CO (15) 5 all proposals to dispose of Defence assets:

- held on the Crown account and with a carrying value of \$25M or more, require Cabinet approval
- with a carrying value of between \$15M and \$25M, require approval by the Minister of Defence.

6.18 CDF ordinarily leads and is accountable for the disposal phase, in collaboration with the Secretary of Defence. Together, they Co-Chair the capability governance board (CGB): the CGB approves the establishment of a major disposal project.

6.19 To give effect to a disposal project the following responsibilities are undertaken:

- the capability management group (CMG) oversees capability disposals on behalf of the CGB
- COMLOG is responsible for disposal of assets, equipment and materiel through the National Disposals Office
- AC CAP is responsible for monitoring, planning and managing capability disposals through use of the Capability Management Plans.

## Through Life Support

6.20 Throughout the capability life cycle, the logistics requirements for through life support (TLS) analysis plays a significant role in establishing what it will take to generate a capability at the levels of preparedness required and then to sustain it to meet NZDF outputs. The components of TLS are the following.

- **Systems Engineering.** Systems engineering in the NZDF provides the processes for formally capturing and analysing requirements and allocating those requirements to functional and physical components of the system. During the Strategy and Policy Phase, the capability requirements are captured and extrapolated – typically the readiness and sustainability requirements – into specific support and mission system supportability functional requirements. The functional requirements are extrapolated further during the in-service phase and allocated to specific the integrated logistics support (ILS) elements or mission system components as performance objectives, which are the basis for system and equipment product specifications and associated test documentation.

- **Integrated Logistics Support.** ILS includes all the support elements necessary to ensure a capability can be adequately and economically supported throughout its life. The NZDF elements of ILS are listed below.
  - **Engineering Support**—all considerations necessary to provide input into the design process to minimise identified supportability risks associated with the life cycle supportability requirements of the capability.
  - **Maintenance Support**—develops, establishes, and integrates into the existing infrastructure, a maintenance support system capable of sustaining the capability system throughout its life at minimum overall cost commensurate with meeting the required levels of preparedness.
  - **Supply Support**—includes all spares (units, assemblies, modules, etc.), repair parts, consumables, special supplies, and related inventories needed to support the system.
  - **Training Support**—all the considerations necessary to provide service, civilian, and contractor personnel with the resources, skills and competencies necessary to acquire, operate, support and dispose of a capability system.
  - **Packaging, Handling, Storage, and Transportation (PHS&T)**—all considerations necessary to ensure that capability elements are designed or chosen to optimise preservation, packaging, handling, storing, and transportation requirements.
  - **Facilities**—all considerations necessary to establish permanent and semi-permanent capital works, modification to existing facilities and associated machinery and plant to operate and support a capability system throughout its life cycle.
  - **Support and Test Equipment (S&TE)**
    - includes all tools, special condition monitoring equipment, diagnostic and check-out equipment, metrology and calibration equipment, maintenance stands, and servicing and handling equipment required to support scheduled and unscheduled maintenance actions associated with the system.
  - **Personnel**—includes identification and provision of service, civilian and/or contractor human resources who have pre-requisite training, skills and competencies necessary to acquire, install, test, train, operate, and support a capability system throughout its life cycle.
  - **Technical Data**—identification, acquisition, storage, and utilisation of all forms of data necessary for ILS throughout the materiel life cycle.
  - **Computer Support**—identification, acquisition and management of communication systems, computer systems, information systems, documentation and other resources necessary to provide data processing or information support to the operational, maintenance, supply, training, and administrative requirements of a capability system.
- **Logistic Support Analysis.** Logistic support analysis (LSA) is a complex process that links together the capability system requirements, ILS objectives and life cycle costing to deliver the optimum design of the Support System. It is the technical analysis used to assist in making logistics decisions with the best outcome in terms of life cycle costs and capability availability.
- **Life Cycle Costing.** The majority of capability system life cycle costs occur in-service. However, the decisions that commit NZDF to in-service operating and support costs occur in the acquisition, introduction into service and in-service management phases (and to a lesser extent the delivery phase). The life cycle cost is one of the two most important factors in the ultimate decision on which capability options NZDF acquires (the other being performance specifications). Life cycle costing analysis helps us to understand the capability's total cost of ownership before and during acquisition. LCC is also used throughout the in-service phase to ensure that value for money is being achieved.
- **Counter-Intelligence and Security.** Early integration of counter-intelligence (CI) considerations and security requirements into TLS planning helps ensure security risk is

effectively managed and NZDF capabilities are not compromised by security vulnerabilities within the supply chain. CI provides visibility and understanding of the security threat posed by foreign and domestic threat actors, while security mitigates vulnerabilities affecting personnel, information and physical assets within the supply chain. Effective security processes also help ensure the supply chain is not compromised by a lack of security awareness leading to loss or unauthorised disclosure or access.

## Key Terms

### Integrated logistic support

The management and technical process through which supportability and logistic support considerations are integrated into the design and taken into account throughout the life cycle of systems/equipment and by which all elements of logistic support are planned, acquired, tested, and provided in a timely and cost-effective manner.

## Readiness

6.21 The focus of military strategy is generating and providing military capability and military effects options to the Government. Military capability is the combination of force structure and readiness. The effective generation of military capability includes all aspects of PRICIE.

6.22 With planning being conducted for an operation, the NZDF must ensure that the force elements it intends to use are prepared for military operations. NZDF force elements are kept at varying levels of capability, depending on the employment contexts in which they are likely to be used. In order to be employed on a military operation or task, NZDF force elements must reach their operational level of capability (OLOC). Reaching OLOC means that a particular force element has the required level of readiness to be deployed.

## What Is Readiness?

6.23 Readiness<sup>5</sup> is the term used to describe the way the NZDF holds military capabilities ready to respond to emerging operations. It describes the time taken for designated units and formations to be ready to deploy on military operations, appropriately manned, trained, equipped, and supported to meet the defined conditions and standards for the designated operation.

6.23 Readiness states allow the NZDF to direct the prioritisation of personnel levels and equipment states, and to manage the optimum balance of readiness activities for specific joint military capabilities and specialised force elements. The readiness state for each capability or discrete force element and the defined requirements and standards are specified in the classified annex to the Defence Force Output Plan.

6.24 The readiness of the NZDF for military operations is managed through outputs; specifically outputs 1-3: prepared for operations and other tasks. These outputs encompass the generation of combat forces that can be deployed, sustained, recovered, and regenerated at the scales of effort required to meet the Government's strategic objectives.

## Generation

6.25 Managing the generation of the entire range of military capabilities is a considerable challenge. The total capability requirement comprises the combined resources of the NZDF throughout the 'readiness cycle'. Defining the logistics and personnel requirements against an uncertain baseline requires judgement and is highly dependent on having a level of certainty about the readiness levels of various force elements and decisions regarding the ways and

<sup>5</sup> Also referred to as 'Response Time' – the time period for assigned forces to transition from the directed peacetime readiness level to full operational capability within the Notice to Move period. Readiness is measured as the time from when the Government decides that it will prepare for the employment of the Armed Forces in a particular circumstance to when those forces will be ready to depart New Zealand. Readiness does not include the time taken to deploy or the in-theatre preparation necessary before forces can be declared fully operational in the designated area(s) of responsibility.

means to call on additional personnel, undertake the necessary training and consideration of what assets need to be stockpiled or what can be obtained within the response time.

6.26 This includes support for peacetime training, generating forces for operations as well as recuperating following the withdrawal from the theatre of operations, regenerating the peacetime state of readiness and being ready to start the cycle once again.

## Categories

6.27 The NZDF employs three terms to categorise and manage levels of capability, including – as mentioned above – OLOC, directed peacetime readiness level (DPRL) and basic level of capability (BLOC). These levels recognise that force elements need only be maintained at a level of readiness commensurate with operational requirements and resource limitations.

6.28 FOC includes the total resources needed to achieve operational success in a specific mission. DPRL represents an agreed and funded level of capability based on Government strategic and financial guidance. The key difference between OLOC and DDPRL is that OLOC relates to a specific mission, whereas DPRL relates to generic operational requirements.

6.29 DPRL is formally agreed in organisational performance agreements between CDF and CMs. DPRL provides the link between programmed activities such as exercises, annually allocated financial resources and the corresponding level of material sustainment that is required.

6.30 BLOC is used to categorise the lowest level of capability from which a force element can work up to OLOC within a calculated timeframe, and is used for preparedness planning and reporting purposes only.

## Deficiencies

6.31 There are commonly three types of deficiencies that need to be managed. These are:

- operational deficiencies that apply to the force in being, are usually short term in nature and are usually capable of being remediated
- capability deficiencies that highlight capabilities required to meet preparedness objectives that are not in the inventory
- agreed deficiencies (or DPRL variances) are ongoing shortages, primarily logistics or personnel shortfalls that affect the NZDF's ability to meet preparedness objectives (agreed deficiencies are accepted as planning limitations and may not be the subject of short term remedial action).

6.32 Readiness management involves the allocation of resources and time to commanders to meet the DPRL that have been derived from government guidance, and the management of capability deficiencies.

CHAPTER 7:

# LOGISTIC SUPPORT TO CAMPAIGNS AND OPERATIONS





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## Introduction

7.01 Logistic support to the conduct of campaign and operations requires a tailored logistics system that synchronises the physical and control domains and information environment. The logistics system draws resources from either the national, coalition, or other international, and increasingly commercial support bases. Logistics support to operations covers all generic phases of a campaign or operation. Logistics planning will usually consider all phases of an operation during the initial planning cycle, and continue to refine the logistics plan as the operation progresses.

## Logistic Planning for Campaigns and Operations

### Strategic Level Planning

7.02 The New Zealand Defence Force operations planning process (NZDF OPP) articulates the key strategic- level decision making associated with planning for military operations. The NZDF OPP guides planning at the strategic and operational levels. Operations planning develops military strategic guidance and objectives, which are translated into a series of military actions within a concept of operations or campaign plan.

7.03 The NZDF OPP can be used for both deliberate and immediate planning – either to develop or review standing plans, or to rapidly develop military options for Cabinet to consider and for Headquarters Joint Forces New Zealand (HQJFNZ) to further develop. The NZDF OPP delineates the planning responsibilities of the strategic and operational levels, yet is designed to allow parallel planning at these levels.

7.04 The NZDF OPP is also designed to include the advice of Commander Joint Forces New Zealand (COMJFNZ), Component Commanders, and HQNZDF subject matter experts, ensure appropriate consultation with other government agencies and be

responsive to and integrated with, Cabinet's decision-making processes.

### The Strategic Planning Group

7.05 The strategic planning group (SPG) is the lead group in the NZDF for both deliberate and immediate planning at the strategic level. In the case of deliberate planning, it facilitates the development, review, and amendment of joint service plans. Its work may inform the officials' committee for domestic and external security co-ordination's (ODESC) interdepartmental watch groups and working groups.

7.06 **Responsibilities.** The SPG is responsible to the Chief of Defence Force (CDF) for:

- developing military response options for submission to Government, via the military strategic estimate process
- developing planning guidance, including: CDF intent, military end-state and strategic level objectives, and any other military strategic considerations
- reviewing any draft concept of operations (CONOPS) or campaign plan developed by HQJFNZ, before it is formally submitted to the CDF
- developing, reviewing, and amending NZDF joint service plans, as coordinated by Strategic Commitments and Engagement (SCE) Branch.

7.07 **Membership.** The SPG is brought together on an as-required basis. Its specific composition and its chair will be determined by Vice Chief of the Defence Force (VCDF) and/or Assistant Chief Strategic Commitments and Engagement (AC SCE), and depends upon the nature of the crisis being considered. The group may include other government agencies by invitation, particularly when the NZDF is leading the national response. For more information on the SPG see NZDDP-5.0 *Joint Operations Planning*.

### Real- Life Example: Logistic Planning

Logistic planning for best case possibilities is just as important as planning for the worst case in supporting military operations. In fact, the best case operationally is often the worst case logistically, and the following historical examples support this assertion

The first historical example is provided by the German invasion of France through Belgium in 1914. The German troops marched further and faster than peacetime planners had calculated. Since other logistic calculations were predicted on the estimated rate of advance, they were also in error. As a result, the railroads could not be kept within supporting distance of the advancing armies, and heavy transport companies were totally inadequate. The failure to plan for the operational best case – quick breakthrough and advance – could have serious impact on the capabilities of the combat forces. In this particular case, it did not because the French halted the German advance before logistic difficulties could. Be that as it may, the evidence indicates the German would have had to halt due to logistic problems, and they got as far as they did only through furious improvisation.

The second example of failure to plan for the best case is from the North African campaigns of World War Two. Both Rommel and the Allies succeeded in putting their operational best case into motion, but ultimately failed because these proved to be the logistical worst case. On at least two occasions, Rommel's offensives achieved massive breakthroughs against the British in the east. He was, however, unable to translate these tactical successes into last operational or strategic success because he had completely outstripped his logistics system. Given the distances involved, the primitive transportation infrastructure, the lack of coastal transport capabilities, British air superiority and the lack of effort in correcting these deficiencies, his actions were logistically unsupportable.

#### Commander Logistics Role in the Strategic Planning Group

7.08 Commander Logistics (COMLOG) advises CDF through the Chief Joint Defence Services (CJDS) on all NZDF logistics matters (as the professional head of defence logistics and Strategic J4). As part of this role, COMLOG will provide the support and advice to the SPG on the planning and ongoing sustainment of operations by:

- assisting SCE and HQJFNZ in the development of strategic logistics estimate, in order to produce broad response options (the military strategic estimate is outline below)
- develop expanded depth logistics support options to enhance sustainment to the Services and HQJFNZ
- approving and issuing CDF logistics warning orders and directives as required

- liaising with allies and bilateral partners, in consultation with SCE, on activating and enhancing logistics agreements and implementing arrangements
- providing staff support activities such as writing Cabinet submissions, parliamentary, and ministerial replies; and strategic reporting on current operations and planning.

#### Military Strategic Estimate

7.09 The military strategic estimate is an appreciation process that develops military response options (MRO). These options give choices as to how to respond to a developing situation. The estimate process will identify a problem and consider how the military can be used to resolve or reduce that problem. The estimate starts with a range of broad options, whose feasibility must be scoped in terms of sustainability, suitability, and acceptability to internal

and external audiences. These options are narrowed down to a few MROs. Selection criteria are applied to each MRO to determine a recommended option. If an MRO is endorsed this will be promulgated in a CDF directive, and provide the framework for operational-level planning.

## Operational Level Planning

### The Joint Operations Planning Process

7.10 The joint operations planning process (JOPP) is a sub-process of the NZDF OPP. The JOPP channels the expertise of generalist and specialist staff into a series of interlinked, multi-disciplinary planning groups and teams at HQNZJF.

7.11 For more information on the joint military appreciation process (JMAP) process see the NZDF approved ADFP-5.0.1 *Joint Military Appreciation*.

### Joint Logistic Appreciation Process

7.12 The joint logistic appreciation process (JLAP) is the logistic equivalent of the JMAP. The JLAP is undertaken in parallel to the JMAP in order to develop the logistics plan needed to support the campaign or operation. For more detailed information on the JLAP see the NZDF approved ADFP-4.2.3 *Logistics Planning for Operations*.

### Logistics Intelligence

7.13 Logistics concepts and plans are built upon critical information about the logistic characteristics of the operational theatre. Much of this information is available from open sources such as the internet and travel-related publications. Nevertheless, a logistics reconnaissance is usually essential to confirm information and obtain current data. Logistics reconnaissance is a specialist activity conducted as part of a joint reconnaissance team (JRT) gathering a range of technical information relating to matters such as:

- logistics nodes including sea ports, airports, railheads and road transport modes and infrastructure (for example roads and bridges)
- in-theatre, or coalition deployed support infrastructure including hospitals, water, power, sewerage, and waste disposal
- in-theatre, or coalition deployed maintenance capabilities
- local sources of supplies
- in-theatre, or coalition deployed fuel supplies and storage capacities
- accommodation, both operational and domestic
- availability of host nation support.

7.14 For more information on logistics reconnaissance see NZDF-approved ADFP-4.2.3 *Logistics Planning for Operations*.

## Operational Level Planning Groups

### Commander Joint Forces New Zealand Planning Group

7.15 The COMJFNZ planning group – also known as the commander's planning group (CPG) – is the senior operational-level planning and steering group in the NZDF. It is convened on COMJFNZ's initiative, or on receipt of a CDF warning order. The function and membership of the CPG is discussed in detail in NZDDP-5.0 *Joint Operations Planning*.

### Joint Operations Planning Group

7.16 The joint operations planning group (JOPG) is the main NZDF planning group that develops and coordinates joint, operational-level plans. It integrates the work of the joint intelligence planning group (JIPG) and the joint administrative planning group (JAPG), so as to achieve a holistic approach to planning. The JOPG is responsible for:

- leading the joint operations planning process
- communicating commander's intent, freedoms, constraints, and restrictions
- providing planning guidance to subordinate headquarters and force elements
- producing operational-level correspondence.

7.17 For more information on the JOPG see NZDDP-5.0 *Joint Operations Planning*.

### Joint Administrative Planning Group

7.18 The logistical aspect of planning is covered within the JAPG. The JAPG coordinates the support aspects of planning – logistics, health, personnel, finance, and movements – as well as any resulting concepts of operations, orders, and instructions. It supports the JOPG.

7.19 This group is chaired either by the lead logistics planner for the activity and will largely comprise staff from support functions such as logistics (including movements), personnel, and health.

### Logistic Considerations at the Operational Level

7.20 The following considerations are fundamental to any planning effort:

- understand the purpose of the military action and the commander's intent
- link the military objectives to the desired end-state at the national strategic level
- assess the priorities and risks associated with the operation
- understand the operational environment
- understand the capabilities, limitations, and likely intentions of the adversary or factions involved in a conflict
- plan through to the finish, where the force is redeployed and reconstituted.

7.21 In addition to the considerations above logistics planners need to consider some fundamental information prior to commencing their appreciation process. This information consists of five elements – destination, intensity, scale and timing, and security. These elements are used to address the key questions that require answering during the early stages of the planning process. The five elements below show some of the factors and questions that are taken into consideration. The accuracy and depth of this information will increase and improve as the planning process develops.

- **Destination**

- What are the likely locations?
- What restrictions are there?
- Assess what transport will be required.
- Anticipate the level of in-theatre resource availability.

- **Intensity**

- What is the combat activity profile?
- Identify the rate at which the force will consume.

- **Scale**

- What Force Elements will be deployed?
- What is the force laydown?
- Identify the number of consuming elements required to be sustained.
- Calculate the lift capacity required to transport the force to the destinations.
- Identify how many elements will consume at active combat rate.

- **Timing**

- What is the deployment timescale?
- In what priority do personnel, force elements and equipment need to arrive in theatre?
- What is the duration of the operation?
- Assessed the required capacity and type of deployment transportation.
- Identify when deployment should begin.
- Anticipate recovery requirements.



Figure 7-1: Logistics support is integral to all phases of campaigns and operations.

• **Security**

- What is the threat assessment for both kinetic and non-kinetic harm?
- What is the local security situation? Crime? Local hostility?
- Are locally employed civilians to be used? Has counter-intelligence been consulted? Has field security been tasked to assist clearances?
- Has a vulnerability assessment or key point security survey been conducted?
- Has counter-intelligence provided threat advice on proposed location and likely targets?
- What is the security plan?

7.22 For further details on the role of the JAPG see NZDDP–5.0 *Joint Operations Planning* and HQJFNZ SOP 505.

**Logistic Support to Campaigns and Operations**

7.23 The logistic support organisation established for a campaign or operation will depend on the logistics functions required, the geographical spread of the various force and support elements, and the force and support elements involved. Usually task organised, the logistics support organisation will vary in size and scope, with responsibilities generally ranging from first-line integral support through to third-line general support.

7.24 The logistics support organisation will often be joint in nature with one of its primary functions being to coordinate logistics support across the participating force elements from all three services. A balance of staff from each of the participating services

is required as these staff will not only undertake a specific function within the organisation, but will also provide single-service subject matter expertise.

7.25 Examples of the types of logistics support structures that could be established for a campaign or operation are a:

- joint support task group
- joint national support element
- defence support unit.

### Logistic Support at Each Phase

7.26 Logistics support to campaigns and operations is needed across all generic phases of a campaign or operation, including:

- preparation
- deployment
- sustainment
- closure:
  - redeployment and/or extraction
  - reconstitution.

7.27 These phases are usually initiated sequentially and then may continue concurrently until the operation ceases. Logistics planning will usually consider all phases of a campaign or operation during the initial planning cycle, and continue to refine the logistics plan as the operation progresses.

## Preparation

7.28 Preparation enables transition from planning to execution. Effective preparation ensures that appropriately prepared and equipped forces are in position at the required times and places. Preparations may commence during planning. Similarly, they may continue for some parts of a force, such as reserves, after execution has commenced.

## Deployment

7.29 Deployment involves the assembly at the designated departure point and delivery of force elements, equipment and stores to the joint force area of operations (JFAO), and their preparation for operations. Deployment is generally preceded by a consolidation period that prepares personnel, supplies and materiel for active service. Deployment includes:

- mounting
- strategic movement
- reception, staging, onward movement, and integration (RSOI).

### Mounting

7.30 Whilst mounting is initiated during the deployment phase, it continues throughout a campaign or operation as follow-on force elements continue to undergo force preparation, deployment, as part of relief in place (RiP). The COMJFNZ is the mounting authority and appoints a mounting headquarters (MHQ) for each operation. The mounting authority is responsible for specifying the force preparation requirements (including Scales of Equipment) of the deploying force elements and ensuring that those requirements are met. These preparations ensure that forces are fully prepared in accordance with the specific operational requirements.

7.31 Mounting may include activities such as:

- movement to and concentration at a mounting base
- equipping and general training of deploying force elements
- acquisition of additional equipment by emergency purchase or against a urgent operational requirement (UOR)
- maintenance and modification of equipment
- individual and collective preparation, such as mission specific

- training and health preparations
- movement to loading areas and subsequent embarkation onto
- deployment modes.

## Strategic Movement

7.32 The coordination of movement is essential to ensure that the flow of force elements from mounting bases to the JFAO is efficient and effective, specifically sequenced to ensure that the forces arrive in theatre in the operationally planned order of deployment. Equally important is the effective and efficient use of transport assets and transport terminals to facilitate the embarkation and debarkation of force elements. Movement coordination is managed by J34 within the J3 Branch, HQJFNZ, in coordination with J4 Branch. Movement of force elements is conducted in three phases.

- **Preparation for Movement.** This involves the actions taken in respect to personnel, materiel and vehicles prior to assembly and loading on to transport
- **Assembly.** This involves the controlled movement from unit locations to an assembly area
- **Embarkation/loading.** This involves the coordinated movement to the point of embarkation in a predetermined order, and loading force elements onto transport.

## Reception, Staging, Onward Movement, and Integration

7.33 RSOI is the last phase to be conducted in the deployment phase of an operation, although it continues throughout an operation. The four processes of RSOI are the following.

- **Reception.** This includes all functions required to receive and clear force element personnel, equipment, and materiel through the points of debarkation in theatre.
- **Staging.** This includes assembling, temporarily

holding and organising arriving personnel, equipment and material into their force elements and preparing them for onward movement and employment. Staging includes marrying up personnel and equipment that may have moved separately during strategic movement. Staging may also provide opportunities for activities such as servicing equipment, training, rehearsals, and exchange of liaison officers.

- **Onward Movement.** This is the process of moving force elements and accompanying materiel from reception facilities, marshalling, and staging areas to tactical assembly areas, operational areas or other theatre destinations.
- **Integration.** This is the synchronised transfer of mission ready force elements to their operational commander for operational employment. It also includes handover/takeover during relief in place activities.

## Sustainment

7.34 Following deployment and the commencement of operations the focus of logistics switches from supporting deployment to sustainment of the force (noting that RSOI will continue to be supported throughout the operation). Sustainment refers to the provision of personnel and logistics support and any other form of other support required to maintain deployed force capability until successful accomplishment of the mission. Materiel sustainment is a vital element of sustainment.

7.35 Sustainment is achieved by a combination of NZDF and/or coalition provided, or commercially sourced logistics support. Separate maritime, land and air sustainment systems managed and delivered within the DLC meet the requirements of each environmental contingent (platform / capability support) and each have unique structures and processes. Sustainment will be influenced by supported function, environment, location, priorities, and threat. Sustainment in support of a remote theatre involving force elements from more than one Service may employ several systems

concurrently, however wherever possible a common sustainment system will be directed and implemented by HQJFNZ. Methods of controlling sustainment (including the 'push' and 'pull' systems) and establishing logistic nodes and modes were discussed earlier in Chapter 5.

### Key Term

#### Sustainment

Sustainment is the provision of personnel and logistics support and any other form of other support required to maintain deployed force capability until successful accomplishment of the mission.

## Campaign and Operation Closure

7.36 The end of a campaign or operation can be a chaotic and complex phase with many parallel and simultaneous activities. It requires careful and detailed planning by commanders and their logistics staff to ensure coordination with the overall campaign and mission plans, and therefore its success. Logistics activity will at a determined point become the main effort of the deployed forces. Pressure may well come to bear for the early return of troops however this should not adversely affect the redeployment plan for the sake of speed alone.

7.37 Planning for the conclusion of a campaign or operation and its longer-term consequences forms part of the initial analysis of the desired campaign end-state and the means to achieve it. These plans will need to be further developed as the Mission drawdown progresses. Failure to organise and conduct an orderly end to a campaign can result in the loss of:

- personnel
- equipment
- money
- morale

- coalition support
- public support and reputation
- goodwill.

7.38 Most importantly lives can be unnecessarily lost and any gains from a successful operation be wiped out by a poorly planned campaign conclusion.

### Drawdown

7.39 Drawdown is the graduated, orderly reduction and withdrawal of forces. It may be conducted by the theatre or joint task force headquarters (JTFHQ) or a separate headquarters. A theatre extraction team (TET) may be established by HQJFNZ to facilitate the recovery of materiel from the operational theatre to an agreed point in New Zealand. Tasks will include the drawdown of non-unit equipment, materiel, and combat supplies, specifically the identification, accounting, refurbishment if necessary, appropriate cleaning and border control clearance, and dispatch of items to the national support area (NSA) in accordance with the instructions and requirements of COMLOG and his subordinate commanders. See HQJFNZ standard operating procedure (SOP) 410 for more information on theatre extraction.

7.40 Drawdown will also include giving appropriate specialist advice to withdrawing units on material management issues such as equipment recovery and identification, disposal action if required, and accounts reconciliation. A drawdown unit may also include local disposals and gratuitous issues, and dependant on the operation and what remains in theatre, could conceivably take under command all movement assets associated with force recovery.

### Redeployment

7.41 Redeployment is the transfer of forces and materiel to support another joint force commander's operational requirements, or to return personnel, equipment, and materiel to the home and/or demobilisation stations for reintegration and/or out –



processing. Redeployment is normally conducted in stages. If a campaign or operation is not complete, this phase will involve the redeployment of only those forces that are no longer required, or that are to be rotated.

7.42 Redeployment includes recovery into a port of embarkation, cleaning and refurbishment of equipment, repackaging of unused materiel, environmental rehabilitation, and movement out of the JFAO. Redeployment at the end of the campaign or operation may require deployment of additional logistic assets into the theatre. Redeployment can also include ammunition and waste disposal, port operations, closing contracts and other financial obligations, disposing of contracting, records and files, clearing minefields, other explosive ordnance disposal activities, and ensuring that appropriate force elements remain in place until their missions are complete.

## Key Terms

### Drawdown

Drawdown is the graduated, orderly reduction and withdrawal of forces. It may be conducted by the Theatre or Joint Task Force Headquarters (JTFHQ) or a separate headquarters.

### Redeployment

Redeployment is the transfer of forces and materiel to support another joint force commander's operational requirements, or to return personnel, equipment, and materiel to the home and/or demobilisation stations for reintegration and/or out – processing.

### 7.43 Redeployment to Other Contingencies.

Forces deployed may be called upon to rapidly deploy to another theatre. Commanders and their staff should consider how they would extricate forces and ensure that they are prepared for the new contingency. This might include such things as a prioritised redeployment schedule, identifying aerial ports for linking intra- and inter-theatre airlift, the most recent intelligence assessments and associated geospatial

intelligence products for the new contingency, and some consideration to achieving the national strategic objectives of the original contingency through other means.

7.44 Responsibility for the repatriation of material from an operation theatre to an agreed point in New Zealand lies with HQ JFNZ. Following guidance on the issue into service of urgent operation requirement (UOR) material, the DLC is then responsible for the receipts, inspection, repair, rectification and redistribution of material.

## Theatre Extraction and Relief in Place

7.45 The redeployment of a force out of a theatre of operations is a complex phase, requiring considerable detailed planning, and the deployment of dedicated extraction capabilities force insertion and extraction team (FIET) or TET.

- **Relief in Place.** Relief in place (RIP) is the process of repatriating a deployed force from a theatre of operations and replacing it with another force. It is necessary to deploy a FIET during the rotation of most NZDF overseas missions. A FIET is composed of logistics, movement and subject matter experts such as medical and psychological support staff, deployed from New Zealand. The team manages and directs the rotation process for a deployed force, the maintenance of mission equipment and the replacement of the outgoing contingent by the incoming New Zealand rotation. See HQJFNZ SOP 415 for more information on force insertion and extraction.
- **Theatre Extraction.** Theatre extraction is the process of repatriating a deployed force and its entire infrastructure from a theatre of operations, without replacement. This marks the end of the New Zealand presence in the mission area. The New Zealand contingent may or may not hand over to a contingent from another nation. A TET is composed of logistics, movement and subject matter experts from New Zealand, who will manage and direct the repatriation process of the deployed force and its infrastructure. It

## Real- Life Example: Theatre Extraction Team New Zealand Forces in East Timor

The extraction of New Zealand Forces in East Timor (NZFOREM) was a substantial undertaking that entailed the repatriation of New Zealand Battalion (NZBATT) 6, the 3rd Squadron Royal New Zealand Air Force (RNZAF) Detachment, the national command element (NCE) and the national support element (NSE), and all associated stores and equipment. There was a need to carry out this process quickly so that the stores and equipment could be reintegrated in force elements regenerating in New Zealand. The requirement had to be balanced against the need for thorough stocktaking measures and meeting the rigorous cleanliness requirements of the Ministry of Agriculture and Fisheries inspectors. There was also a need to ensure continual operational effectiveness in the area of operations (AO) up to the cease operations date.

Prior to the deploying the theatre extraction team (TET), both an extraction and reconstitution reconnaissance was undertaken by logistics, movements and equipment fleet management specialists scoping the task and the final plan.

In September 2002, the advance elements of the TET were deployed to East Timor. Initially an advance team was deployed and numbers increased steadily to a peak of 54 NZDF personnel. The number was then gradually reduced to a small rear party by December 2002. The TET comprised quartermaster/suppliers, movement operators, equipment support, a command element, and a team from the Ministry of Agriculture and Fisheries.

An NZDF audit team accompanied the TET to audit the process and monitor the closure of the mission. The lessons learned from the TET process was:

- that the desire to extract deployed force elements quickly must be balanced against the requirement to effectively manage the extraction process
- all necessary functional disciplines should be represented in the logistics reconnaissance conducted during the extraction planning process
- when extracting the force elements, attention must be paid to the purchase, control and gratuitous issue of equipment
- extraction planners required detailed information on the quantity and type of stores and equipment deployed as well as an assessment of their condition.

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may also handle the handover of equipment and infrastructure to another nation whose force is replacing the New Zealand contingent. As this task is greater than that of force extraction, it is likely to include additional resources and capabilities. See HQJFNZ SOP 410 for more information on theatre extraction.

## Reconstitution

7.46 Reconstitution is the process of restoring materiel and equipment returned from an operational deployment to a serviceable and operationally useable condition, subsequently returning it either to a parent operating unit, or into operational reserve.

The reconstitution process is therefore focussed on the equipment capability and supporting inventories, rather than restoration of the personnel and unit capability which is a separate process referred to as Regeneration.

7.47 Planning for the reconstitution of redeployed equipment is undertaken by the J4 as part of the theatre drawdown plan. This planning involves the fleet managers (FMs) within DLC with the outcome being an agreed and workable financially costed plan and timeline for the return of equipment and its induction into maintenance, repair, and overhaul (MRO) facilities, and reintegration of any inventories being returned.

7.48 At that agreed point of handover, responsibility for the equipment transfers from the operational commander to the parent Service, however its reconstitution is still managed as a cost against the Mission budget.

7.49 Critical to the reconstitution effort and the establishment of costs is the full condition assessment of all equipment and inventory at the agreed point of handover. Deployed operations are often conducted in harsh environments which can markedly reduce the life of equipment and inventory. The implications of accelerated wear and tear, and battle damage must be determined at this time to enable:

- identification of full funding requirements for reconstitution
- inclusion in capability management plans of any changes to capability lifecycles resulting from the deployment.

7.50 Fleet managers need to review short to medium term maintenance and inventory plans to ensure that they are aligned to the designated levels of capability required including any changes to contingency reserve stocks.

## Externally Sourced Logistics Support

7.51 Campaigns and operations conducted by the NZDF will generally depend on a degree of externally sourced support at each phase. The types of externally sourced support options are:

- support from a coalition partner/s (multi-national logistics)
- host nation support
- support from a civilian contractor.

## Multinational Logistics

7.52 Multinational logistics is the full spectrum of modes used to logistically support operations other than purely national. These include multinational integrated logistic support, role specialisation support and lead nation logistic support. Multinational

logistics is a tool, which, depending on the operational requirements and the specific situation, can significantly enhance efficiency and effectiveness. More specifically, the benefits of multinational logistics can be the reduction of the overall costs and of the deployed logistic footprint, increased ability of nations to contribute their fair share of support, the improvement of the force's flexibility, the conservation of scarce local resources and a better use of specific national expertise.

7.53 Multinational logistics is not an aim in itself. During the force planning and the force generation process, the applicability, necessity, availability and benefits of multinational logistics must be considered. Unilateral national logistic decisions could adversely impact on the effectiveness of the NZDF's commander's mission. Multinational logistic solutions should be pursued at the outset of the logistic planning process but alternatively can be introduced during an operation as the situation evolves. The NZDF can apply multinational logistics where it replaces less effective or efficient national solutions. Retaining the overall operational responsibility for the specific missions, the NZDF commander is well suited to act as broker between nations to facilitate such multinational logistics support; these normally take the form of international arrangements and agreements.

### Key Term

#### Multinational Logistics

Multinational logistics is the full spectrum of modes used to logistically support operations other than purely national.

7.54 **International Arrangements and Agreements.** New Zealand has entered into a range of international agreements, arrangements, and relationships that enhance New Zealand's military capacity and preparedness to participate in multinational operations through access to international sources of support. This access through these agreements and arrangements is fundamental to the maintenance of effective logistics support, as it is unlikely that the NZDF will be able to be completely

self-sufficient in any operation. New Zealand applies specific meanings to agreements and arrangements that may differ from practice in other countries. These differences need to be clearly identified when these agreements and arrangements are negotiated and implemented. In New Zealand practice, there are only three types of international agreements and arrangements.

- **Agreements or Treaties.** They are legally binding in international law, and are concluded between countries, the governments of countries, or international organisations
- **Agreements or Contracts.** They are legally binding in the domestic law of a country or part of a country (such as a state or territory), and are concluded between parties which are legal entities under that domestic law.
- **Arrangements or Memoranda of Understanding (MoU).** They are not legally binding in international law or a domestic law but are politically and morally binding only, and can be concluded between any parties.

## Host-Nation Support

7.55 Host-nation support (HNS) provides an additional logistic support method for the deployment and sustainment of forces. HNS is dependent on the government of a nation being able and prepared to provide support from its own resources, as well as one or more nations operating in or through that country and may include overflight and transit arrangements of their sovereign territory. The assistance may be free, loaned or provided on a repayment basis and may range from providing the political framework for ensuring forces are not hindered in their deployment to the provision of facilities and equipment. HNS does not include local contracting by the deploying force, but it can cover situations where the HN acts as an agent to obtain logistic support from commercial sources on behalf of the deploying force. Provision should be made for the fact that HNS cannot always be guaranteed.

## Key Term

### Host-Nation Support

Civil and military assistance rendered in peace and war by a host nation to allied forces and organisations which are located on or in transit through the host nation's territory. The basis of such assistance is commitments arising from alliances or from bilateral or multilateral agreements concluded between the host nation and any other nations having forces operating on the host nation's territory.

7.56 **Host-Nation Support Principles.** A number of principles should be observed if HNS is to make an effective contribution to the logistic support of a deployed force. These are consistent with the North Atlantic Treaty Organisation (NATO) logistic principles and reflect experience gained on operations and exercises. Application of these principles in planning for HNS will not guarantee success, but will establish a solid foundation for the development of a constructive HNS plan.

7.57 HNS principles are the following.

- **Resources.** HNS is a fundamental source of support for deployed forces and provision must be based on the actual capabilities of the HN. Full account should be taken of national legislation and national priorities.
- **Cooperation.** Cooperation between the NZDF, the HN and coalition partners in the provision and use of HNS is essential. Cooperation should be aimed not only at eliminating competition for scarce resources, but also at optimising the support that the HN may make available in order to facilitate operations. Cooperation could also extend to international organisations (IO) and non-governmental organisations (NGO) that may be operating alongside United Kingdom and coalition forces.
- **Coordination.** Coordination of HNS planning and execution between New Zealand, coalition

### Real- Life Example: New Zealand Mutual Agreements in East Timor

Superior mutual logistic support agreements and relations with other forces were essential for the NZDF in Timor with regards to acquiring the necessary equipment and supplies. One of the real strengths of the planning process was the way in which the logistics team was fully involved in each step on all aspects of the plan's developments. This meant that logistics considerations were properly taken into account from the start of operational planning.

The NZDF planned to be self-sufficient when it first arrived to East Timor and arrived in theatre with sixty days' worth of supplies. While the ADF suggested that forty-two days was sufficient it turned out to be fortunate that the NZDF had brought more supplies. This is because the New Zealand battalion group initially had to support a larger force in the Suai area because resupply had been presenting serious difficulties.

NZDF logistic planners had to contend with a shortage of skilled movements staff, the limited capacity of the NZDF's container-handling equipment and not knowing where in East Timor the NZDF would be deployed and into what conditions. However the NZDF built upon the experiences they had derived from NZDF operations in Bosnia and elsewhere.

To make best use of the available expertise, a specialist container preparation and packing team was established and supplementary container-handling equipment was borrowed from commercial sources in New Zealand. The cranes performed extremely well and were described by the force commander as 'the most valuable piece of equipment in East Timor'.

The NZDF realised they lacked the capacity to rapidly deploy anything more than a company group with its own transport assets. The ADF were unable to assist as their resources were fully stretched by their own commitment to East Timor. In fact, from an early stage the ADF made it clear that they would require assistance from New Zealand with airlift and sealift capabilities, as well as medical support for the new operation.

The initial work done by the joint planning group indicated that to transport bulk of the equipment and supplies required a battalion group to charter two merchant ships, each of about 7500 tonnes. The RNZAF also needed be supplemented if New Zealand's contribution to the international force were to be quickly deployed. There was the possibility that the USAF would provide transport craft to assist New Zealand, but time pressure and other factors meant that this did not occur. Instead a Boeing 747 freighter was leased to carry high priority freight to Darwin.

The benefits and many agreements reached under the ongoing Closer Defence Relations agreement with Australia were shown in the logistics field by the agreement signed between the NZDF and the ADF for mutual logistic support for the operation in East Timor.

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partners and national authorities is essential for reasons of operational effectiveness, efficiency, and the avoidance of competition for resources. It must be carried out at appropriate levels and may include IOs and NGOs where appropriate. This will require the appointment of a national representative or liaison officer to work alongside other organisations and, where appropriate, with the multinational commander responsible for coordinating HNS.

- **Efficiency.** The planning and execution of HNS must reflect the most effective use of resources available to fulfil the requirement. In order to ensure that HNS resources are used in the most effective and efficient manner possible to meet operational imperatives, they should be utilised to achieve economies of scale and improve the overall availability of support.

7.58 **Planning.** The use of HNS will have a major impact on logistic planning. It must be evaluated as a factor in the military strategic estimate process and taken into consideration in the overall planning process for operations and exercises. HNS procedures have been developed over time, but HNS planning must be flexible and able to deal both with generic and specific planning assumptions. HNS planning, development and implementation must be properly coordinated in order to provide the services and resources required for operational effectiveness.

7.59 **Host Nation Support Arrangements.** Host nation support arrangements (HNSA) include memorandum of understanding (MOU), technical arrangements (TA) and implementing arrangements (IA). The deployment of military forces on expeditionary operations, however, is more likely to involve nations and organisations where there are no existing HNSA. Expeditionary operations require an ability to develop the necessary HNSA more rapidly and with greater flexibility.

### Civilian Contractors

7.60 Civilians are involved generally on an on-occurrence basis and there is no requirement for their

general involvement in preparedness and mobilisation. Civilian contractors, however, may on some occasions be critical to the success of an operation, and in this event appropriately security cleared contractors may be included in the preparedness management system, in planning for operations and in performance assessment through the exercise process. Civilians can be deployed in the support of operations in any threat level provided that they can be protected from the threat. The expectation would be that civilians could be used extensively where the threat is not high, but reliance on civilians would be minimised in high threat situations commensurate with the criticality of the service they provide.<sup>6</sup>

7.61 The NZDF is required to provide a safe and healthy environment for its members to work in. This obligation extends to civilian contractors who deploy in support of NZDF operations. It means that NZDF Commanders are to apply practical measures to protect them from the risk of work related injury or death.

7.62 **Locally Engaged Contractors.** For deployed operations, the use of host nation and/or third country contractors should be restricted, where possible, to undertaking tasks that do not require formal clearances with the only determination being whether they are considered to be 'fit and proper' for the task at hand. An assessment by the local police, where they exist, may be sufficient. However, where locally recruited staff need to be Security cleared, the current vetting process must be followed. In all cases the contract is to specify how the NZDF's interests are to be protected by a deployed contractor employing local or third country nationals.

7.63 **Pre-deployment Training.** Prior to operational deployment, all civilian contractor personnel will require training in the basic skills needed to live and work in the theatre, particularly if they are to be collocated with NZDF elements. Training would usually include such subject areas as hygiene, discipline,

<sup>6</sup> For further information on the use of civilian contractors refer to the NZDF approved ADFP-4.2.1 *Civilians in Support of ADF Operations* and its New Zealand Supplement.

routine, physical security aspects and other military related requirements. In most circumstances the training requirement would also include awareness of the laws of armed conflict, the provisions of any status of forces agreement (SOFA), and local culture and customs.

# GLOSSARY

## Terms and Definitions

All terms and definitions are taken from the New Zealand Supplement to AAP-06 unless otherwise indicated.

### Accountability

The obligation of a Service or Civil Staff member, the MOD employee, agent or person to answer for, or be accountable for, work, action or failure to act following delegated authority. In financial terms, accountability attaches to the person who accepts responsibility for the results of the cost element, cost centre, function activity or output.

### Acquisition

Acquisition is the act of procuring major items of equipment/capability needed to meet the NZDF capability requirements.

### Administration

The provision and implementation of regulations and procedures related to the management of an organisation in support of the accomplishment of its mission.

### Area of Operations

An area of operations (AO) is an operational area defined by the joint commander for land or maritime forces to conduct military activities. Normally, an AO does not encompass the entire JFAO, but is sufficient in size for a joint commander to accomplish assigned missions and protect forces.

### Capability Development

A broad term for those activities involved with defining requirements for future capability, principally during the requirements phase of the capability systems life cycle.

### Combat Service Support

The support provided to combat forces, primarily in the fields of administration and logistics.

### Defence Policy

Defence Policy is how the Government intends to defend the nation and its interests through the application of military force and other uses of military forces and defence resources.

### Distribution

The operational process of synchronising all elements of the logistic system to deliver the 'right things' to the 'right place' at the 'right time' to support the geographic combatant commander.

### Doctrine

Fundamental principles by which military forces or elements thereof guide their actions in support of national objectives. It is authoritative but requires judgement in application.

### Force Element

An individual or discrete military capability comprising trained personnel, major platforms, combat systems and supplies held at a directed level of readiness.

### 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.

**Note:** In the medium- term to the long-term, military capability will vary due to changes in force generated by the capability development process. In the short-term, force structure is the more constant component of military capability and the level of capability available for operations is determined by Defence's management preparedness of the current force.



### **Forward Mounting Base**

A location used to support operations without establishing full support facilities.

**Note:** a forward operating base may be used for an extended time period and is supported by a main operating base.

### **Freight Distribution Centre**

Describes the integrated functional areas of traffic, central receipts, central processing inclusive of packaging, returned stores section and freight terminal.

### **Governance: Corporate**

Corporate governance is the process and structures for overseeing the strategic direction and management so that the department carries out its mandate and objectives effectively.

### **Host-Nation Support**

Civil and military assistance rendered in peace and war by a host nation to allied forces and organisations which are located on or in transit through the host nation's territory. The basis of such assistance is commitments arising from alliances or from bilateral or multilateral agreements concluded between the host nation and any other nations having forces operating on the host nation's territory.

### **In-Service Support**

The management and execution of support activities to ensure continued attainment of the intended operational capabilities of the system/equipment during its in-service phase.

### **Integration**

The synchronised transfer of mission ready units into the operational commander's force.

### **Intermediate Staging Base**

A temporary location used to stage force elements prior to inserting them into a host nation.

### **Joint**

Activities, operations and organisations in which elements of at least two services participate.

### **Joint Effect**

The integrated approach that allows the value of a Joint Force to become more than merely the sum of its components.

### **Joint Force**

A general term applied to a force composed of significant elements of the Navy, Army and Air Force, or two or more of these Services, operating under a single joint force commander.

### **Joint Force Area of Operations**

That portion of a theatre necessary for joint military operations and their administration as part of a campaign.

### **Logistics**

Logistics is the planning and carrying out of the movement and sustainment of forces. In its most comprehensive sense, the aspects of military operations which it deals with as the following:

- design and development, acquisition, storage, movement distribution, maintenance, evacuation and disposal of materiel
- transport of personnel
- acquisition or construction, maintenance, operation and disposition of facilities
- acquisition or furnishing of services
- medical and health service support (HSS).

### **Maintenance**

1. All actions taken to retain equipment in or to restore it to a specified condition, including inspection, testing, servicing, classification as to serviceability, repair, rebuilding and reclamation.
2. All supply and repair action taken to keep a force in condition to carry out its mission.

3. The routine recurring work required to keep a facility (plant, building, structure, ground facility, utility system or other real property) in such condition that it may be continuously utilized, at its original or designed capacity and efficiency, for its intended purpose.

### **Materiel**

All items (including ships, tanks, self-propelled weapons, aircraft, etc, and related spares, repair parts and support equipment but excluding real property, installations and utilities) necessary to equip, operate, maintain and support military activities without distinction as to its application for administrative or combat purposes.

### **Materiel Maintenance**

All action taken to retain materiel (equipment) in or to restore it to a specified condition, including inspection, testing, servicing, classification as to usability, repair, rebuilding and reclamation. There are two categories of materiel maintenance:

- a. Operator maintenance - maintenance that may be performed by authorised personnel who are appropriately trained and qualified but who need not be technical tradespersons. It includes routine and parade servicing, functional tests, non-technical inspections, authorised operator repair tasks, and operator tasks during scheduled services.
- b. Technical maintenance - maintenance that must be performed by authorised tradespersons. Technical maintenance includes technical inspections, testing, calibration and corrective maintenance actions.

### **Minimum Level of Capability**

The lowest level of capability from which a force element can achieve its operational level of capability within readiness notice, and it encompasses the maintenance of core skills, safety and professional standards.

### **Mode**

The physical means of moving materiel and personnel.

### **Mounting**

All preparations made in areas designated for the purpose, in anticipation of an operation. It includes the assembly in the mounting area, preparation, and maintenance within the mounting area, movement to loading points, and subsequent embarkation into ships, craft, or aircraft if applicable.

### **Mounting Base**

A base located within the national support base which acts as the focal point for the mounting and sustainment of a deployed force.

### **Movement**

The activity involved in the change in location of equipment, personnel or stocks as part of a military operation. Movement requires the supporting capabilities of mobility, transportation, infrastructure, movement control and support functions.

### **Multinational Logistics (JDP-0.01)**

Multinational logistics is the full spectrum of modes used to logistically support operations other than purely national.

### **National Support Area**

Encompasses the full range of organisations, systems and arrangements (both formal and informal) that own, control or influence NZDF access to and use of capability. Note: in geographic (physical) terms, the national support base refers to the New Zealand nation.

### **Node**

The point at which resources are acquired, maintained, stored and moved from one mode to another.

### **Onward Movement**

The process of moving units and accompanying materiel from reception facilities and marshalling and staging areas, to tactical assembly areas or other operating areas.

### Operations support

The support needed to deploy and redeploy a tailored force, and sustain it for the duration of an operation, and requires the establishment of a tailored logistic network that draws resources from the national and international support base, and positions those resources at the appropriate time and place using support bases and nodes to meet the supported forces' needs.

### Preparedness

The measurement of how ready and how sustainable forces are to undertake military operations.

**Note:** it describes the combined outcome of readiness and sustainability.

### Readiness

The ability of a force to be committed to operations within a specified time and refers to the availability and proficiency/serviceability of personnel, equipment, facilities and consumables allocated to a force.

### Readiness Notice

The specified amount of time in which a force is to complete its workup from the directed level of capability/minimum level of capability to operational level of capability.

### Reception

The process of receiving, offloading, marshalling and transporting personnel, equipment and materiel from the strategic and/or inter theatre deployment phase to a sea, air or transportation point of disembarkation to the marshalling area.

### Redeployment

The transfer of a unit, an individual or supplies deployed in one area to another area, or to another location within the area, or to the support area for the purpose of further employment.

### Staging

Includes the assembling, temporary holding and organising of arriving personnel, equipment and materiel into units and forces and preparing them for onward movement and employment.

### Supply

The procurement, distribution, maintenance while in storage and salvage of supplies, including the determination of kind and quantity of supplies:

- **Producer Phase.** That phase of military supply which extends from determination of procurement schedules to acceptance of finished supplies by the Services.
- **Consumer Phase.** That phase of military supply which extends from receipt of finished supplies by the Services through issue for use or consumption.

### Sustainability (ADDP-4.0)

The ability of a force to maintain the necessary level of combat power for the duration required to achieve its objectives.

### Sustainment

The provision of personnel, logistic, and other support required to maintain and prolong operations or combat until successful accomplishment or revision of the mission or of the national objective.

### Technical Control

The specialised or professional guidance and direction exercised by an authority in technical (professional) matters.

### 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. Note: a theatre may contain one or more joint force areas of operations.

**Transport**

The means of conveyance to move forces, equipment, personnel and stocks and includes the requisite materials handling equipment.

## Acronyms and Abbreviations

AC CAP	Assistant Chief Capability	DLOC	Campaign Plan
AC SCE	Assistant Chief Strategic Commitments and Engagement	DLS	Directed Level of Capability
ADDP	Australian Defence Doctrine Publication	DPG	Defence Legal Services
ADF	Australian Defence Force	DSG	Defence Planning Guidance
ADFP	Australian Defence Force Publication	DTA	Defence Support Group
ALOC	Air Lines of communication	EUC	Defence Technology Agency
AO	Area of Operations	FDC	End User Certificate
APOD	Air Point of Disembarkation	FE	Freight Distribution Centre
APOE	Air Point of Embarkation	FIB	Force Element
BLOC	Basic Level of Capability	FIC	Force-in-Being
CA	Chief of Army	FJLC	Fundamental Inputs to Capability
CAF	Chief of Air Force	FJOC	Future Joint Logistics Concept
CDF	Chief of the Defence Force	FMB	Future Joint Operating Concept
CDP	Capability Definition Phase	HDEI	Forward Mounting Base
CEO	Chief Executive Officer	HNS	Head of Defence Estate and Infrastructure
CGB	Capability Governance Board	HPC	Host-Nation Support
CI	Counter Intelligence	HQ	Head Personnel Capability
CIOG	Chief Information Officer Group	HQJFNZ	Headquarters
CIMIC	Civil-Military Cooperation	HSNO	Headquarters Joint Forces New Zealand
CJDS	Chief Joint Defence Services	H&SE	Hazardous Substances and New Organisms
CMG	Capability Management Group	ILS	Health and Safety Employment
CMP	Capability Management Plan	ISB	Integrated Logistic Support
CM	Capability Manager	ISS	Intermediate Staging Base
CN	Chief of Navy	JAPG	In-Service Support
COMLOG	Commander Logistics	JFAO	Joint Administrative Planning Group
COMJFNZ	Commander of Joint Forces New Zealand	JIPG	Joint Force Area of Operations
CONOP	Concept of Operation	JLC	Joint Intelligence Planning Group
CPG	Commander's Planning Group	JLAP	Joint Logistics Command
CSS	Combat Service Support	JMAP	Joint Logistics Appreciation Process
C2	Command and Control	JMOVGP	Joint Military Appreciation Process
DEPSEC PSP	Deputy Secretary People Strategies and Policy	JOPP	Joint Movements Group
DIME	Diplomatic, Information, Military, and Economic	JOPG	Joint Operations Planning Process
DLC	Defence Logistics Committee	JRT	Joint Operations Planning Group
DLCCP	Defence Logistics Command	JSPG	Joint Reconnaissance Team
		JTF	Joint Support Planning Group
		JTF Comd	Joint Task Force
		LCC	Joint Task Force Commander
			Life Cycle Costing

LED	Light Emitting Diode	SPOD	Sea Point of Disembarkation
LOGCC	Logistics Component Commander	SPOE	Sea Point of Embarkation
LSA	Logistics Support Analysis	TECHCON	Technical Control
LTIP	Long Term Investment Plan	TLS	Through Life Support
NZDDP	New Zealand Defence Doctrine Publication	UOR	Urgent Operational Requirement
NZDF	New Zealand Defence Force	UK	United Kingdom
MAA	Materiel Acquisition Agreement	US	United States
MB	Mounting Base	USAR	Urban Search and Rescue
MHQ	Mounting Headquarters	VCDF	Vice Chief of the Defence Force
MILIS	Military Integrated Logistic Information System		
MLOC	Minimum Level of Capability		
MRO	Military Response Option or Maintenance, Repair, and Overhaul		
MSA	Materiel Support Agreement		
MTA	Maritime Transport Act 1994		
NCE	National Command Element		
NSA	National Support Area		
NSE	National Support Element		
ODESC	Officials Committee for Domestic and External Security Coordination		
OLOC	Operational Level of Capability		
OPLAN	Operation Plan		
OVP	Operational Viability Period		
PDT	Pre-Deployment Training		
PHS&T	Packaging, Handling, Storage, and Transportation		
PIC	Priority Industry Capability		
R&D	Research and Development		
RIP	Relief in Place		
RMA	Resource Management Act		
RN	Readiness Notice		
RSOI	Reception, Staging, Onward Movement, and Integration		
S&TE	Support and Test Equipment		
SCE	Strategic Commitments and Engagement		
SDSS	Standard Defence Supply System		
SLOC	Sea Lines of Communication		
SPG	Strategic Planning Group		
SPO	Systems Program Office		

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