



Australian Government

Department of Defence

The background features a map of Southeast Asia and Oceania in shades of blue and teal. Overlaid on the map are several white-outlined geometric shapes: a large diamond, a large rectangle, and a smaller rectangle, creating a complex, layered effect.

# 2016 **INTEGRATED** **INVESTMENT** **PROGRAM**

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**2016** INTEGRATED INVESTMENT PROGRAM



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The background features a large, dark grey, angular shape on the left side, which tapers towards the right. The rest of the background is a light grey gradient. Several teal-colored geometric shapes, including triangles and polygons, are scattered across the top and right areas, some overlapping each other and the grey shapes. These teal shapes are defined by thin white outlines.

# OVERVIEW



## ► Overview

- 1 In developing the *2016 Defence White Paper*, Defence adopted an integrated approach to bring together for the first time the key elements of investment needed to deliver and sustain Australia's defence capabilities. The key elements include equipment, infrastructure, information and communications technology, science and technology, and workforce. Establishing a ten-year *Integrated Investment Program* will facilitate the whole-of-capability and whole-of-life approach to investment reflected in the implementation plan for the *First Principles Review: Creating One Defence*. It will also support strategy-led prioritisation of proposals and greater agility in investment decisions.
- 2 The Integrated Investment Program was developed through a comprehensive Force Structure Review that assessed Australia's defence capability needs to meet the challenges of the future operating environment into the 2030s. In designing the future force, the Force Structure Review ensured alignment between defence strategy, capability, and resources. The result is an affordable and balanced plan for a highly capable, agile and potent Australian Defence Force (ADF) and Defence capability more broadly, to meet our future requirements.
- 3 A key objective of the Force Structure Review was to ensure that key enablers of capability such as wharves, airfields, training areas and bases, information and communications technology systems, and supporting science and technology were accorded appropriate priority in investment decisions. Planned investment over the decade to FY 2025–26 recognises the essential contribution of enablers to the generation and sustainment of ADF capability.
- 4 The Integrated Investment Program will guide the implementation of the bulk of investment over the decade to FY 2025–26 to build the future force and Defence capability goals of the Defence White Paper. The Integrated Investment Program will be reviewed annually as part

of the development of the budget; the Program will evolve in response to changes in Australia's strategic circumstances, including capability priorities, and developments in technology.

## Integrated Investment Program – Structure and Management

- 5 The force structure and our broader Defence capability comprises:
    - ▶ equipment such as ships, submarines, aircraft and armoured vehicles
    - ▶ information and communications technology systems such as static and deployable networks and communications systems
    - ▶ infrastructure such as airfields, port facilities and training areas
    - ▶ trained people, including ADF, APS and contracted personnel.
  - 6 Defence has previously managed separate programs of investment for major equipment, facilities and information and communications technology and has endeavoured to maintain appropriate project linkages both within and between each program, including:
    - ▶ the Unapproved Major Capital Investment Program (also known as the Defence Capability Plan)
    - ▶ the Approved Major Capital Investment Program (those projects that have received final Government approval for acquisition)
    - ▶ the Major Capital Facilities Program (including investment in Defence bases, training ranges and infrastructure such as wharves and airfields)
    - ▶ information and communications technology services
    - ▶ group and Service workforce plans.
-

- 7 For the first time, these formerly separate programs are now incorporated within the Integrated Investment Program. An integrated approach to capital investment planning will provide the framework for a more coherent and efficient approach to managing the development of future Defence capability. A single investment program will reduce the risk of incomplete or fragmented approaches to investment; for example, if we acquire new ships or aircraft, then the supporting wharves and air bases, the underlying information and communications technology, and required changes to workforce priorities should be assessed by Defence and considered by Government as an integrated whole.
- 8 As a management tool, the Integrated Investment Program will better enable trade-offs and prioritisation of proposals from one year to the next, as strategic circumstances evolve. Through this program, managers will have greater visibility of the inter-relationship between projects across different domains.
- 9 Importantly, the Integrated Investment Program will better enable Defence to avoid making inadequate or ill-timed investment in those enablers (such as infrastructure and information and communications technology) that are fundamental to the generation of military capability.
- 10 The Integrated Investment Program focuses on the first ten years of investment, with broad guidance on the second decade to FY 2035–36 where feasible, to allow for longer-term investment portfolio planning. It allocates investment of approximately \$195 billion (pre-ERC 2016–17 out-turned price basis) in the decade to FY 2025–26 to fund investment in support of the future force. Delivery of many investments made in the decade to FY 2025–26 will extend well beyond this decade; for instance future submarines and frigates.

## Industry Involvement

- 11 As outlined in the Defence White Paper and the Defence Industry Policy Statement, the Government recognises that an internationally competitive Australian defence industry is a fundamental input to Defence capability. Without the support of industry, Defence does not have effective capabilities. This is especially the case in the increasingly high-technology world of military systems.
  - 12 The effective implementation of the Integrated Investment Program will be underpinned by greater stability in Defence budgets, streamlined capability development and acquisition processes, and closer and more effective engagement between Defence and industry. The ambitious and extensive program of future investment in major defence capability that is set out in this document provides enormous opportunities for industry; the program's scope will also set challenges for industry in responding in an effective and timely manner to these opportunities.
  - 13 The Defence White Paper and Defence Industry Policy Statement set out the Government's policy for an internationally competitive Australian defence industry that contributes more directly, and earlier in the process, to support Defence's capability development and sustainment needs. Through the Integrated Investment Program, Australian industry will have a broader view of potential opportunities in Defence procurement, and greater certainty about the timing and sequencing of planned approvals. This will inform business planning. The Integrated Investment Program's strong foundation in the strategy and policy of the Defence White Paper will enable Defence and industry to work more collaboratively in identifying and developing innovative capability solutions that are driven by the outcomes sought.
  - 14 The hard copy version of the Integrated Investment Program provides a consolidated overview of the elements of the plan for the future force; it does not provide an exhaustive list of projects. Since the
-

status of projects will change as they move through the different stages of the approval cycle, it will be inefficient to maintain a current hard copy version of the Integrated Investment Program. To ensure that industry has access to current information, an online version will be periodically updated to reflect changes in the program. Defence proposes to further develop the content and the level of detail provided in the Integrated Investment Program. Early engagement with industry, through dialogue mechanisms such as industry forums building on the existing environmental working groups, will be a key part of the future development of the Integrated Investment Program.

## The Future Force and Defence Capability

- 15 The planned future force builds on a solid foundation of existing ADF capability. Our air capabilities are being transformed through agreed plans, including the decision to acquire F-35A Lightning II Joint Strike Fighter aircraft. The last decade to FY 2015–16 has seen substantial investment in our land capabilities. The Integrated Investment Program will invest further in new armoured vehicles, digitisation, and further development of our amphibious capability. We are entering a major program of modernisation for our naval capabilities, with key decisions to be made on future submarines, frigates, and patrol vessels.
- 16 Importantly, the Integrated Investment Program addresses previous underinvestment in the key enablers that support and maximise Australia's defence capability. The focus on enablers will ensure our future force is appropriately supported, works coherently together as a whole, and is sustainable.
- 17 The Force Structure Review undertaken in support of the Defence White Paper has ensured that current Defence capabilities, and those proposed, are aligned with strategic guidance, so that Defence can do the jobs asked of it by the Australian Government, and are affordable

within agreed resources. The Strategic Defence Framework that guided development of the Integrated Investment Program is outlined in Table 1.

Table 1: Australia’s Strategic Defence Framework

Strategic Defence Interests		
A secure, resilient Australia, with secure northern approaches and proximate sea lines of communication.	A secure nearer region, encompassing maritime South East Asia and the South Pacific.	A stable Indo-Pacific region and a rules-based global order.
Strategic Defence Objectives		
Deter, deny and defeat attacks on or threats to Australia and its national interests, and northern approaches.	Make effective military contributions to support the security of maritime South East Asia and support the governments of Papua New Guinea, Timor-Leste and of Pacific Island Countries to build and strengthen their security.	Contribute military capabilities to coalition operations that support Australia’s interests in a rules-based global order.

- 18    The Force Structure Review’s investment planning was guided by all three Strategic Defence Objectives listed above, which for the first time carried equal weight in guiding decisions on force structure and posture. Interoperability with the United States was also a key principle of our force design. Defence’s strategic policy framework is outlined in greater detail in the Defence White Paper. The future force and Defence capability goals in this Integrated Investment Program will enhance our ability to: defend Australia; conduct independent operations in our region, in particular maritime South East Asia and the South Pacific; and contribute to global coalition operations.
- 19    Building on existing capabilities, the ADF of the future will feature decision-making superiority, and enabled, mobile and sustainable forces with potent and agile offensive response capabilities. Key to the effective development of the future force will be to ensure that Defence has the skilled people we need, in the right timeframes. This will require some reshaping of the Defence workforce, supported by innovative ADF and Defence APS workforce recruitment, training and retention programs, in line with the First Principles Review. Defence will also be postured to deliver a more active and internationally engaged ADF that is highly interoperable with United States forces.

- 20 The breadth, complexity and interrelated nature of all Defence capabilities and enablers led to the development, in the Force Structure Review, of a new framework to adequately explain the link between strategy and capability. The six capability streams in the framework are used in the Integrated Investment Program to better represent the key force elements – how they are typically employed and their planned enhancements. This was a deliberate move away from describing our capability investment plans in a stovepiped structure. These six capability streams also support building a clearer picture of the link between capabilities, systems and their supporting enablers in creating key Defence outputs:
- ▶ Intelligence, surveillance, reconnaissance, electronic warfare, space and cyber
  - ▶ Key enablers
  - ▶ Air and sea lift
  - ▶ Maritime and anti-submarine warfare
  - ▶ Strike and air combat
  - ▶ Land combat and amphibious warfare.
- 21 The relationship between the key attributes of the future force and planned enhancements across the six capability streams is outlined in Table 2.

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Table 2: Future force attributes mapped to capability streams

Key Attributes	Defence Capability Streams
Decision-making superiority	Intelligence, surveillance, reconnaissance, electronic warfare, space and cyber
Enabled, mobile, and sustainable forces	Key enablers
	Air and sea lift
Potent and agile offensive response	Maritime and anti-submarine warfare
	Strike and air combat
	Land combat and amphibious warfare

- 22 This framework provides a clearer basis to describe the scope and level of capital investment associated with each of the six capability streams, and provides a more comprehensive picture of plans for the development of the future force and Defence capability more broadly. Each attribute and its associated capability streams are discussed in more detail on the following pages, including the major equipment, facilities, information and communications technology, and workforce investments that relate to each category.

### Decision-Making Superiority

- 23 To ensure our forces can operate effectively and safely in our region and globally, they need a comprehensive picture of what is happening around them. They also need to be able to operate effectively in a contested electronic environment. This requires analysis, fusion and dissemination of information to support decision makers at all levels.

#### ***Intelligence, surveillance, reconnaissance, electronic warfare, space and cyber***

- 24 Existing capabilities and approved acquisitions that contribute to Australia's *intelligence, surveillance, reconnaissance, electronic warfare, space and cyber* capabilities include:
- ▶ the air defence network (including the Vigilaire air surveillance network and the Jindalee operational radar network)
  - ▶ our access to a range of situational awareness information including from space surveillance systems (C-band radar and space surveillance telescope) supported by Australia's alliance with the United States and membership of the Five-Eyes intelligence community
  - ▶ electronic warfare operational support capabilities
  - ▶ a growing cyber capability.
-



- 25 Defence will strengthen existing capabilities in the *intelligence, surveillance, reconnaissance, electronic warfare, space and cyber* function including in support of domestic counter-terrorism, through acquiring:
- ▶ modernised all-source intelligence systems supported by enhanced processing capabilities
  - ▶ enhanced space situational awareness
  - ▶ enhanced capacity to generate and analyse imagery
  - ▶ new and enhanced unmanned intelligence, surveillance, and reconnaissance capabilities (including the MQ-4C Triton unmanned aircraft system)
  - ▶ a new electronic warfare support capability based on long-range commercial aircraft
  - ▶ new and enhanced command, control, communications and intelligence, surveillance and reconnaissance systems.
- 26 Australia will develop its cyber capabilities to deter and defend against the threat of cyber attack. Enhanced cyber capabilities will improve our ability to defend our own networks and systems effectively and ensure the ADF is able to operate securely as the global cyber threat increases.

## Enabled, Mobile and Sustainable Forces

### **Key enablers**

- 27 The proposed future force accords a high priority to increasing investment in those key enablers essential to supporting the operation and sustainment of the future force. Defence will implement a comprehensive program of investment aimed at:
- ▶ continuously developing, monitoring and maintaining critical infrastructure including airfields, wharves and port facilities, key ADF bases and logistics systems such as fuel and explosive ordnance facilities

- ▶ upgrading weapons ranges, testing facilities and health services (that enable training and exercises to support more advanced weapons and systems development, and joint integration in realistic conditions)
- ▶ upgrading training facilities that enable ADF training and exercises (including in collaboration with other partners)
- ▶ developing enterprise simulation capabilities to support enhanced joint ADF test and training activities
- ▶ upgrading garrison and deployable health services
- ▶ enhancing information and communications technology that supports all Defence business from peacetime activities through to high end combat operations
- ▶ using science and technology programs to investigate next generation technologies so that Defence can both leverage, and where necessary protect against, potential new military applications
- ▶ strengthening force design, strategic and international policy capabilities, and international engagement that supports and sustains Defence operations and increased presence in the region.

### ***Air and sea lift***

- 28 Given the huge distances over which the ADF must operate – in our own country, region and globally – robust air and sea lift capabilities are essential. Flexible air and sea lift capabilities will enable the ADF to reach, resupply and sustain missions in different locations and to move around the area of operations in a timely and reliable manner.
- 29 The existing capabilities and approved acquisitions that contribute to air and sea lift are:
- ▶ transport aircraft (8 C-17A Globemaster IIIs, 12 C-130J Hercules, and 10 C-27J Spartans)
-

- ▶ air-to-air refuelling aircraft (7 KC-30A Tankers)
- ▶ helicopters (7 CH-47F Chinooks and 47 MRH-90 Troop lift helicopters)
- ▶ a logistics support ship (HMAS *Choules*)
- ▶ acquisition of a new large-hulled multi-purpose patrol vessel, the Australian Defence Vessel *Ocean Protector*, for the Navy to support border protection and maritime resource security-related tasks with the Australian Border Force.

- 30 The *Canberra* Class amphibious ships can also provide substantial support for sea lift as a secondary role.
- 31 Enhancements in this capability stream to support the future force include:
- ▶ additional air-to-air refuellers
  - ▶ acquiring three additional Chinooks to expand battlefield lift capacity and support tactical missions (including aero-medical evacuation)
  - ▶ 2 new replenishment vessels, with an additional vessel (a replenishment ship or logistics support ship) to be acquired in the late 2020s
  - ▶ extending the life of, and upgrading HMAS *Choules*
  - ▶ considering future additional heavy-lift transport aircraft
  - ▶ considering a future long-range aero-medical evacuation and combat search and rescue capability.

## Potent and Agile Offensive Response

### ***Maritime and anti-submarine warfare***

- 32 A force that is able to conduct more challenging maritime and anti-submarine warfare operations in the broader region will improve Defence's ability to meet future operational demands, including a

greater contribution to theatre anti-submarine operations in our region. This includes the ability to conduct a spectrum of tasks ranging from border security and hydrographic survey, through to patrols, anti-piracy operations and combat at sea. Our maritime force will become more potent out to the 2030s through the acquisition of higher capability systems and better integration of sea and air platforms.

- 33 Existing capabilities and approved acquisitions that contribute to Australia's maritime and anti-submarine warfare capabilities include:
    - ▶ the *Collins* Class submarine fleet, which will be upgraded to ensure that it remains a potent capability through the rest of its life
    - ▶ P-8A Poseidon maritime surveillance and response aircraft
    - ▶ Seahawk naval combat helicopters
    - ▶ sensor, weapons and combat system upgrades to the *Anzac* Class frigates and *Hobart* Class Air Warfare Destroyers
    - ▶ the current fleet of *Armidale* Class patrol boats, supplemented by additional patrol boats as required.
  - 34 New investments to build the capability and capacity of Australia's maritime force include:
    - ▶ 12 regionally superior submarines to replace Australia's existing fleet of 6 *Collins* Class submarines
    - ▶ 9 anti-submarine warfare frigates to replace Australia's existing fleet of 8 *Anzac* Class frigates
    - ▶ 12 patrol vessels capable of more extended operations than the existing *Armidale* Class patrol boats
    - ▶ initially an additional 4 Poseidon aircraft, with a further 3 aircraft later in the 2020s to bring the total to 15
    - ▶ modernised mine countermeasures and an efficient combination of military and commercial hydrographic survey capabilities
    - ▶ a new deployable land-based anti-ship missile capability.
-

### ***Strike and air combat capability***

- 35 A potent strike and air combat capability will enable effective airspace control (in the defence of Australia and its territories or when ADF elements are deployed on operations) and precision strike at long ranges. A robust set of current and planned platforms and systems provide the basis upon which to build the future capability, which could encompass theatre-level integrated air and missile defence in support of deployed forces. Substantial investments are proposed to strengthen our platforms; command, control, communications, computer and intelligence systems; sensors; and advanced weapons.
- 36 Existing capabilities and approved acquisitions that contribute to Australia's strike and air combat capability include:
  - ▶ fighter and strike aircraft (24 F/A-18F Super Hornets and 72 F-35A Lightning II Joint Strike Fighters) and our current fleet of 71 F/A-18A/B 'classic' Hornets which is being progressively retired
  - ▶ electronic attack aircraft (12 E/A-18G Growlers)
  - ▶ early warning and control aircraft (6 E-7A Wedgetails)
  - ▶ air defence systems.
- 37 These capabilities will be enhanced through:
  - ▶ new air-to-surface, air-to-air and high-speed and long-range strike and anti-ship weapons
  - ▶ upgrades for the Growler aircraft
  - ▶ future replacement of the Super Hornets
  - ▶ better integration of air and space surveillance systems, including upgrades to command and control capabilities
  - ▶ enhanced fixed and deployable air search radars
  - ▶ deployable ground-based air-defence systems
  - ▶ light helicopters that are rapidly deployable by transport aircraft.

***Land combat and amphibious warfare capability***

- 38 While relatively small on a regional or global scale, substantial investment in our land force capabilities, in particular in the last ten years, has provided a solid foundation upon which to further develop the ADF's land combat and amphibious warfare capabilities.
- 39 Existing capabilities and approved acquisitions include:
- ▶ advanced personal equipment for soldiers
  - ▶ protected mobility (such as Bushmasters and the Hawkei)
  - ▶ enhanced force protection (such as capabilities to counter improvised explosive devices)
  - ▶ new artillery
  - ▶ enhanced digital communications.
- 40 In addition, the *Canberra* Class amphibious ships will provide options for the employment of land forces across the region.
- 41 New investments will enhance land combat and amphibious warfare capabilities through improved situational awareness, firepower, protection, mobility and force sustainability. These investments will include:
- ▶ a program for continuously improving soldiers' personal equipment and force protection
  - ▶ expanding digital communications and networks with enhanced joint integration
  - ▶ acquiring a new generation of armoured vehicles
  - ▶ upgrading the existing M1 Abrams Main Battle Tank fleet
  - ▶ enhancing battlefield intelligence, surveillance and reconnaissance capabilities through a new armed, medium-altitude long-endurance unmanned aircraft and a suite of tactical unmanned systems
-

- ▶ replacing the Tiger helicopter fleet with a future armed aerial reconnaissance capability from the mid-2020s
  - ▶ acquiring combat and amphibious support systems including over-the-beach logistics and beached materiel recovery
  - ▶ acquiring additional small boats and other specialist capabilities such as breaching, bridging and recovery equipment
  - ▶ acquiring a new long-range rocket system.
- 42 Further detail of the key elements of existing and planned future ADF and Defence capabilities is provided throughout this document.

## Defence Workforce

- 43 The Defence workforce, both ADF and APS, will need to be reshaped to meet the demands of a more technologically capable and active future force.
- 44 The future force will require a larger ADF workforce. As outlined in the Defence White Paper, the permanent ADF workforce will grow to around 62 400 over the decade to FY 2025–26 – its largest size since 1993. This growth reflects around 4 800 new or reallocated ADF positions, comprising a net increase over currently approved plans of around 2 500 positions over the decade to FY 2025–26. Up to 2 300 existing positions will be re-allocated to higher priority activities. As the future force evolves over the longer term (in the 2030s), further growth is likely to be required along with changes for the different skills needed. A new contemporary workforce management model will increase the ability of ADF members to move between the permanent ADF and Reserves to best meet their individual circumstances and best harness their skills and expertise. This will provide ADF members with more opportunities to contribute to Australia’s defence.

- 45 In addition to the growth in ADF numbers, the Defence White Paper will provide for a future APS workforce of around 18200 Full Time Equivalent (FTE), down from 22300 FTE in June 2012. This workforce will include approximately 1200 new APS positions in areas critical to Defence's future capability, including intelligence, cyber security and space-based capabilities. The new positions will be offset by reductions elsewhere in the APS workforce. Implementation plans for the First Principles Review will inform the future shape of the Defence organisation and the Defence APS workforce in particular.
- 46 The generation of sustainable workforce capacity in key skill areas will require concerted effort well beyond the mid-2020s. There will continue to be challenges in attracting, recruiting and retaining the right people for the right jobs in an increasingly competitive market place. The strength of Defence's leadership and its ability to adapt and embrace a more diverse and inclusive culture will be critical to attracting and retaining the workforce it needs for the future. Defence will employ a range of strategies to achieve the skilled workforce required in the timeframe needed to deliver and support the future force.
- 47 It is essential that Defence pursues enterprise solutions to workforce challenges, including a more strategic approach to workforce planning; enhanced information and communications technology systems will be critical to this work. This approach will need to better enable Defence to sustain a diverse range of specialist training and skills development, and will be further articulated in the strategic workforce plan being developed as part of the implementation of the First Principles Review.

## Funding the Integrated Investment Program

- 48 The Integrated Investment Program of approximately \$195 billion over the decade to FY 2025–26, including already approved major investments, has been developed within the agreed funding guidance for the Defence portfolio.
-



- 49 The Government directed that the Defence White Paper align Defence strategy, capability and resources. To ensure that the Government had higher levels of confidence in the cost and schedule attributed to future investment, Defence undertook a comprehensive program of external cost assurance, with a particular focus on the development of the future force, in support of a fully costed White Paper. This is the most comprehensive cost assurance that has been undertaken for a Defence White Paper.
- 50 Defence engaged a panel of private sector specialists, including Australian and internationally-based experts, who are globally recognised for their cost analysis and assessment services, to undertake detailed resource analysis and to provide cost and schedule assurance of Defence's major investment plan.
- 51 On balance, Defence assesses that the independent cost assurance process was invaluable in informing the work of the Defence White Paper, in particular in terms of guiding judgements on cost and capability trade-offs. The cost assurance work provided a greater level of transparency and rigour in the development of a balanced investment program than would have been possible had this work been conducted solely in-house.
- 52 Defence will embed external cost assurance that draws on private sector expertise as part of a new contestability function in Defence to ensure that the acquisition of Defence capability is aligned with strategy and resources and can be delivered.

# Balance of Future Investment: Overview

53    The approximate division of investment planned over the decade to FY 2025–26 across the six capability streams in the Integrated Investment Program is illustrated in Figure 1.

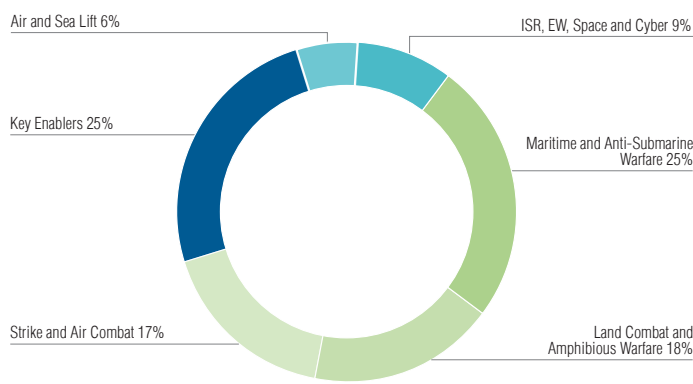


Figure 1: Ten Year Division of Investment by Capability Stream to FY 2025–26

54    A summary of key investments over the decade to FY 2025–26 within each of the six capability streams is provided in the following pages. While the Integrated Investment Program is not intended to provide an exhaustive list of all Defence expenditure, it highlights the major proposals in capital equipment, infrastructure, information and communications technology and workforce that are needed to deliver and support the future force and fulfil the capability goals of the Defence White Paper.

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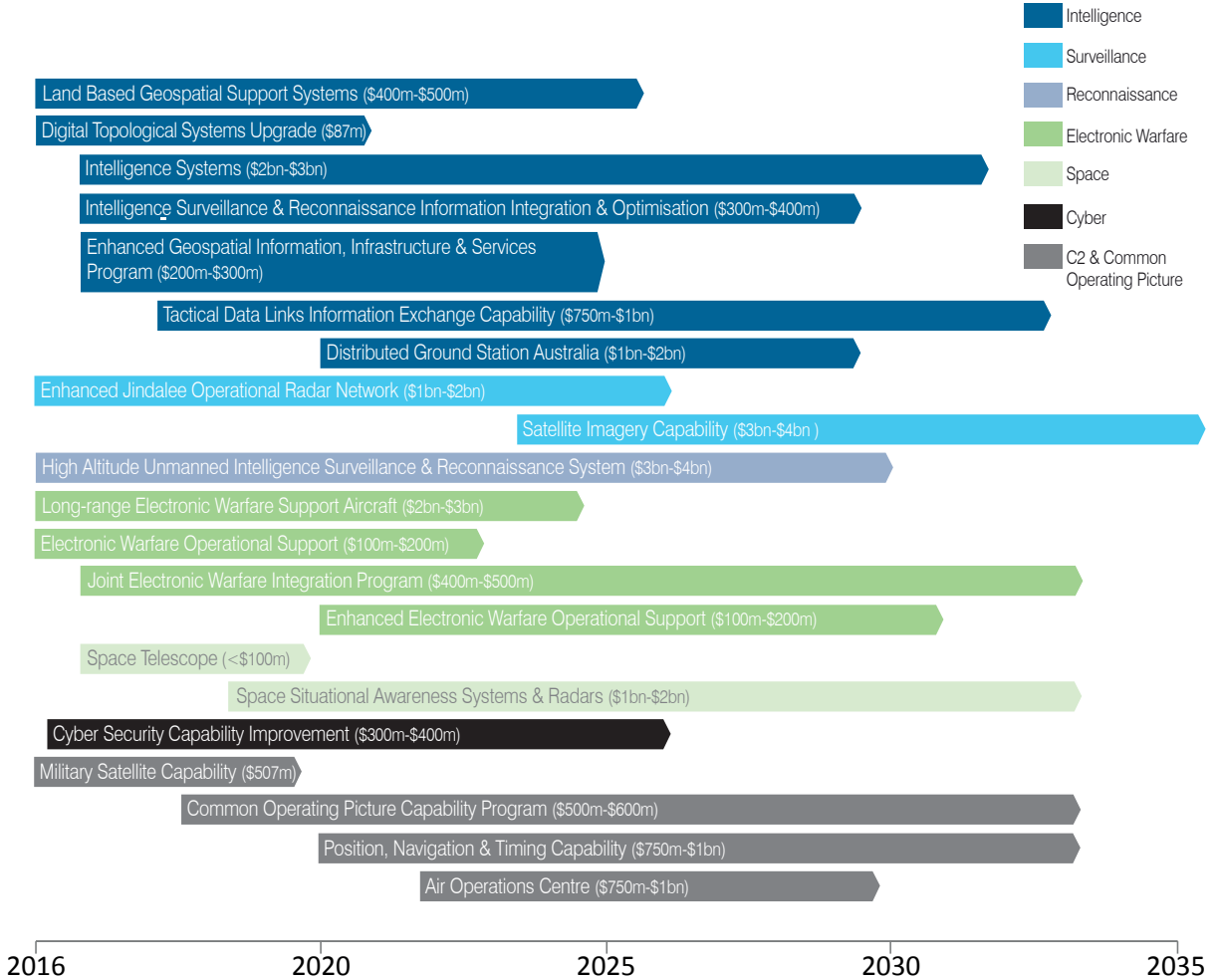
# DECISION-MAKING SUPERIORITY

CAPABILITY STREAM: INTELLIGENCE,  
SURVEILLANCE, RECONNAISSANCE,  
ELECTRONIC WARFARE, SPACE AND CYBER



# Proposed Future Force (Intelligence, Surveillance, Reconnaissance, Electronic Warfare, Space & Cyber)

Indicative Acquisition Windows of Key Approved & New Programs



## ► Decision-Making Superiority

Capability Stream: Intelligence, surveillance, reconnaissance, electronic warfare, space and cyber

- 1.1 Over the decade to FY 2025–26, Defence will invest around nine per cent of the Integrated Investment Program to enhance Australia's intelligence, surveillance, reconnaissance, electronic warfare, space and cyber capabilities. Evolving threats and changes in technology require further investment to develop and maintain a capability edge, including through strengthening our decision-making superiority.
  - 1.2 Existing capabilities and approved acquisitions that contribute to Australia's intelligence, surveillance, reconnaissance, electronic warfare, space and cyber capabilities include:
    - the air defence network (including the Vigilaire air surveillance network and the Jindalee operational radar network)
    - our access to a range of situational awareness information including from space surveillance systems (C-band radar and space surveillance telescope) supported by Australia's alliance with the United States and membership of the Five-Eyes intelligence community
    - electronic warfare operational support capabilities
    - a growing cyber capability.
  - 1.3 Defence will strengthen existing capabilities in the intelligence, surveillance, reconnaissance, electronic warfare, space and cyber functions. This will include acquiring:
    - modernised all-source intelligence systems supported by enhanced processing capabilities
-



- ▶ enhanced space situational awareness
- ▶ enhanced capacity to generate and analyse imagery
- ▶ new and enhanced unmanned intelligence, surveillance, and reconnaissance capabilities (including the MQ-4C Triton unmanned aircraft system)
- ▶ a new electronic warfare support capability based on a long-range commercial aircraft
- ▶ new and enhanced command, control, communications and intelligence, surveillance, and reconnaissance systems.

- 1.4 Australia will develop its cyber capabilities to deter and defend against the threat of cyber attack. Enhanced cyber capabilities will improve our ability to defend our own networks and systems effectively and ensure the ADF is able to operate securely as the global cyber threat increases.
- 1.5 Over the decade to FY 2025–26, significant new investment is planned for infrastructure and facilities upgrades that primarily support the ADF's intelligence, surveillance, reconnaissance, electronic warfare, space and cyber capabilities. Key proposals include upgrading facilities at Harold E. Holt Communications Station in Exmouth, Western Australia and at the communications facility located at HMAS Harman, Australian Capital Territory.

## Intelligence, surveillance, reconnaissance, electronic warfare, space and cyber workforce summary

- 1.6 Enhancements in the intelligence, surveillance, reconnaissance, electronic warfare, space and cyber domains will require around 900 additional ADF positions and around 800 APS positions (including through reshaping the workforce) over the decade to FY 2025–26. People with suitable aptitudes and skills for this area are in strong demand across the broader economy; Defence personnel growth will be supported by targeted recruitment and a joint approach to training and retention programs.

1.7 Workforce reshaping and growth in this capability stream will support:

- ▶ collecting and analysing intelligence, with a particular focus on strengthening intelligence capabilities in support of deployed forces (for example to support increased use of unmanned systems)
  - ▶ improving support to counter-terrorism operations
  - ▶ enhancing geospatial systems analysis and support, including information and communications technology systems, and strengthened collection and assessment capabilities
  - ▶ processing, exploiting and disseminating the large volumes of data that will be generated by sophisticated platforms – such as the P-8A Poseidon maritime surveillance and response aircraft, unmanned intelligence, surveillance, and reconnaissance systems (including Triton), F-35A Lightning II Joint Strike Fighter, E/A-18G Growler, *Hobart* Class Air Warfare Destroyer, future frigates and future submarines
  - ▶ generating intelligence and mission data for pre-programming advanced platforms
  - ▶ enhancing cyber capabilities
  - ▶ developing further space command, control, communications, computer and intelligence systems and space surveillance sensors, including ground support functions
  - ▶ improving electronic warfare planning and coordination, and spectrum management
  - ▶ enhancing our ability to develop electronic warfare countermeasures to protect ADF systems
  - ▶ enhancing situational awareness across all domains and environments.
-





## Intelligence, surveillance, and reconnaissance

### ***Air and space situational awareness***

- 1.8 The future force will be characterised by more sophisticated intelligence, surveillance, and reconnaissance systems and long-range air defence and strike weapons employed by maritime, air and ground forces, along with increasing reliance on space-based capabilities. To this end, Defence will develop systems, sensors and networks to deliver effective air and space situational awareness around Australia and in deployed locations. A new, more sophisticated command, control, communications, computer and intelligence system will also be required to be able to fuse information from multiple sources. This will enable coordination of forces and more timely operational response, including an ability to support the more comprehensive situational awareness required for capabilities such as integrated air and missile defence.

### ***Common operating picture and tactical data links***

- 1.9 Success in all operations is dependent on providing tailored and near real-time situational awareness to commanders. In the operational sphere this is provided by generating a trusted common operating picture. Defence will continue with functionality enhancements to relevant systems in order to integrate the common operating picture at all levels and provide enhanced situational awareness across the joint force.

### ***Improved processing, analysis and dissemination of intelligence and mission data***

- 1.10 A variety of data needs to be loaded pre-mission or maintained through-mission via data links to use the capacity of new advanced systems and platforms which have a greater capacity to process data on board. These new systems also generate large amounts of data available to be shared and analysed, including situational awareness information such as the location of friendly forces, civilian populations and aircraft, and information on the operational environment and potential threats.

- 1.11 Defence has begun addressing this new requirement in the context of supporting the introduction of the Joint Strike Fighter. We will continue to strengthen our ability to perform near real-time production, exploitation and dissemination of data. This will also entail investment in intelligence and mission data capabilities to support pre-programming of high technology platforms such as the Growler, Joint Strike Fighter and Poseidon aircraft, *Hobart* Class Air Warfare Destroyers and modern armoured vehicles.

***High altitude unmanned intelligence, surveillance, and reconnaissance systems***

- 1.12 From the early 2020s, Defence will acquire an advanced surveillance system comprising seven MQ-4C Tritons, with supporting intelligence, surveillance and control systems. The Triton is a remotely piloted aircraft that is well suited to long-endurance surveillance operations over the ocean. The Triton also enables persistent maritime patrol and other intelligence, surveillance and reconnaissance tasks over a broad area. The aircraft is capable of flying missions in excess of 24 hours, with a range of over 8000 nautical miles, while providing 360 degree surveillance and imagery of an area of up to 2000 square miles. The Triton's operations will be closely coordinated with that of the Poseidon maritime surveillance and response aircraft.
- 1.13 The Triton, including the necessary supporting intelligence, surveillance and control systems, will be upgraded throughout its life to ensure it stays at the leading edge of technology and maintains commonality with United States systems for supportability. Additional facilities will be required at RAAF Bases Edinburgh and Tindal. Enhancements will be required to information and communications technology networks and satellite communications capacity and interfaces to other Australian-specific capabilities and systems.

***Enhanced Jindalee operational radar network***

- 1.14 The Jindalee operational radar network will be enhanced through a spiral development program into the 2030s in order to realise its full
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potential as a wide area surveillance capability. Enhanced command, control, communications, computers and intelligence integration will allow Jindalee to cue and be cued by other systems across the sensor network. The core role of these systems is the defence of Australia and its surrounding airspace by identifying aircraft and some surface vessels approaching Australia.

***Intelligence, surveillance, and reconnaissance information integration and optimisation***

- 1.15 We will continue to address system obsolescence, functionality and integration requirements with the information networks and systems of the Defence Intelligence Organisation, Australian Geospatial-Intelligence Organisation and the Australian Signals Directorate. These measures will also address links with the broader Australian Intelligence Community and systems of partners.
- 1.16 Defence network backbones will be strengthened to provide the capability to store, manage, process and access large amounts of diverse intelligence, surveillance, and reconnaissance information regardless of location, organisation, activity or information source. A secure, seamless high capacity cross-domain link between various Defence networks is a high priority. Intelligence, surveillance, and reconnaissance information will be made discoverable and available across all domains, subject to adequate security safeguards, through new applications and a common architecture that extends into the deployed environment.

***Biometric data storage and management system***

- 1.17 Defence will establish an identity registration and verification capability for operational use which will build on the lessons learned from recent operations in the Middle East and Afghanistan.

***Maritime geospatial data management systems***

- 1.18 Defence will upgrade the digital hydrographic systems at the Australian Hydrographic Office by 2025 to support management of maritime military geospatial information and to support national tasking for survey

and chart production. A mix of enhanced commercial and military hydrographic survey capabilities will increase the throughput of both national and military hydrographic information.

## Electronic warfare

- 1.19 Defence will continue with the acquisition and delivery of a force-level, electronic warfare capability, through a suite of projects to achieve high levels of information fusion and comprehensive planning across the joint force and Defence intelligence agencies. This will improve the ADF's ability to control the electronic environment and where necessary, deny or degrade the electronic systems of adversaries. Existing and planned electronic warfare survivability, tactical validation and countermeasures development programs will continue to enable more rapid countering of emerging threats, including improvised explosive devices.

### ***Long-range electronic warfare support***

- 1.20 From the early 2020s, Defence will acquire up to five long-range electronic warfare support aircraft based on the Gulfstream G550 airframe with additional and modified systems. This capability will substantially enhance electronic warfare support to naval, air and land forces for operations in electromagnetic environments manipulated by hostile forces, with the operating cost, range and endurance benefits of a commercial airframe. The aircraft will be acquired in two tranches and incrementally upgraded to maintain commonality with the United States-developed systems for long-term supportability and to maintain interoperability.

## Space

- 1.21 Additional investment is planned in space-related capability, including space-based and ground-based intelligence, surveillance and reconnaissance systems; and space situational awareness and command, control, communications, computer and intelligence capabilities.
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**Imagery**

- 1.22 Australia's ability to collect and use imagery data will be substantially enhanced, including increasing the capacity for imagery analysis. This will be achieved primarily through additional personnel and equipment for the Australian Geospatial-Intelligence Organisation, and enhanced access to imagery, including imagery from satellites.
- 1.23 Australia will continue to invest in expanding access to geospatial data through both existing and new commercial and partner arrangements. This data will enhance our support to regional and global operations, and improve the resilience of our access to space-derived information, including operational imagery and targeting.

**Space situational awareness**

- 1.24 Australia's existing space situational awareness capability relies on access to comprehensive United States-sourced and processed space situational awareness information. Existing arrangements will be strengthened through the re-location of the C-band radar and optical space surveillance telescope to Australia, enhancing our access to space situational awareness information. Defence will also examine other ground-based sensors, including radar and optical systems, to develop options for expanding Australia's space situational awareness sensor coverage in the future.

**Cyber****Enhanced cyber capabilities**

- 1.25 The cyber threat to Australia is growing. This threat represents a real and present risk to our national security and economic prosperity. As a priority, Australia's cyber capability will be developed to deter and defend against the threat of cyber attack. Enhancements will be introduced at the strategic level, such as protecting static information and communications technology networks, and at the operational and tactical levels, including deployed ADF networks and systems. Defence

will continue to work closely with other agencies to protect Australian interests in the cyber domain, including through the multi-agency Australian Cyber Security Centre.

- 1.26 One of the key risks to delivering an enhanced cyber capability will continue to be in recruiting and retaining this highly skilled workforce. The particular knowledge and skills required are currently in short supply across Australia.

Table 3: Summary of key investment decisions from FY 2016–17 to FY 2025–26

Program title	Program Timeframe	*Approximate investment value
Military Satellite Capability	Approved	\$507m
Electronic Warfare Operational Support	Scheduled for approval†	\$100m–\$200m
High Altitude Unmanned Intelligence Surveillance and Reconnaissance System (initial phase)	Scheduled for approval†	Less than \$100m
Digital Topological Systems Upgrade	Approved	\$87m
High Altitude Unmanned Intelligence Surveillance and Reconnaissance System	2017–2030	\$3bn–\$4bn
Satellite Imagery Capability	2023–2039	\$3bn–\$4bn
Long-range Electronic Warfare Support Aircraft	2017–2024	\$2bn–\$3bn
Intelligence Systems	2016–2031	\$2bn–\$3bn
Enhanced Jindalee Operational Radar Network	2017–2026	\$1bn–\$2bn
Space Situational Awareness Systems and Radars	2018–2033	\$1bn–\$2bn
Distributed Ground Station Australia	2019–2029	\$1bn–\$2bn
Tactical Data Links Information Exchange Capability	2016–2031	\$750m–\$1bn
Position, Navigation and Timing Capability	2019–2033	\$750m–\$1bn
Air Operations Centre	2022–2029	\$750m–\$1bn
Common Operating Picture Capability Program	2017–2033	\$500m–\$600m
Land Based Geospatial Support Systems	2017–2025	\$400m–\$500m
Joint Electronic Warfare Integration Program	2016–2033	\$400m–\$500m

Program title	Program Timeframe	*Approximate investment value
Intelligence Surveillance and Reconnaissance Information Integration and Optimisation	2016–2029	\$300m–\$400m
Cyber Security Capability Improvement	2016–2025	\$300m–\$400m
Enhanced Geospatial Information, Infrastructure and Services Program	2016–2025	\$200m–\$300m
Enhanced Electronic Warfare Operational Support	2019–2030	\$100m–\$200m
Space Telescope	2016–2019	Less than \$100m

\*The figures in the table cover the acquisition element of the programs. There will be additional investment in whole-of-life sustainment and operating costs for each program. All figures are calculated on an out-turned price basis.

†Project scheduled for approval in FY 2015–16.



# ENABLED, MOBILE AND SUSTAINABLE FORCES

CAPABILITY STREAM: KEY ENABLERS

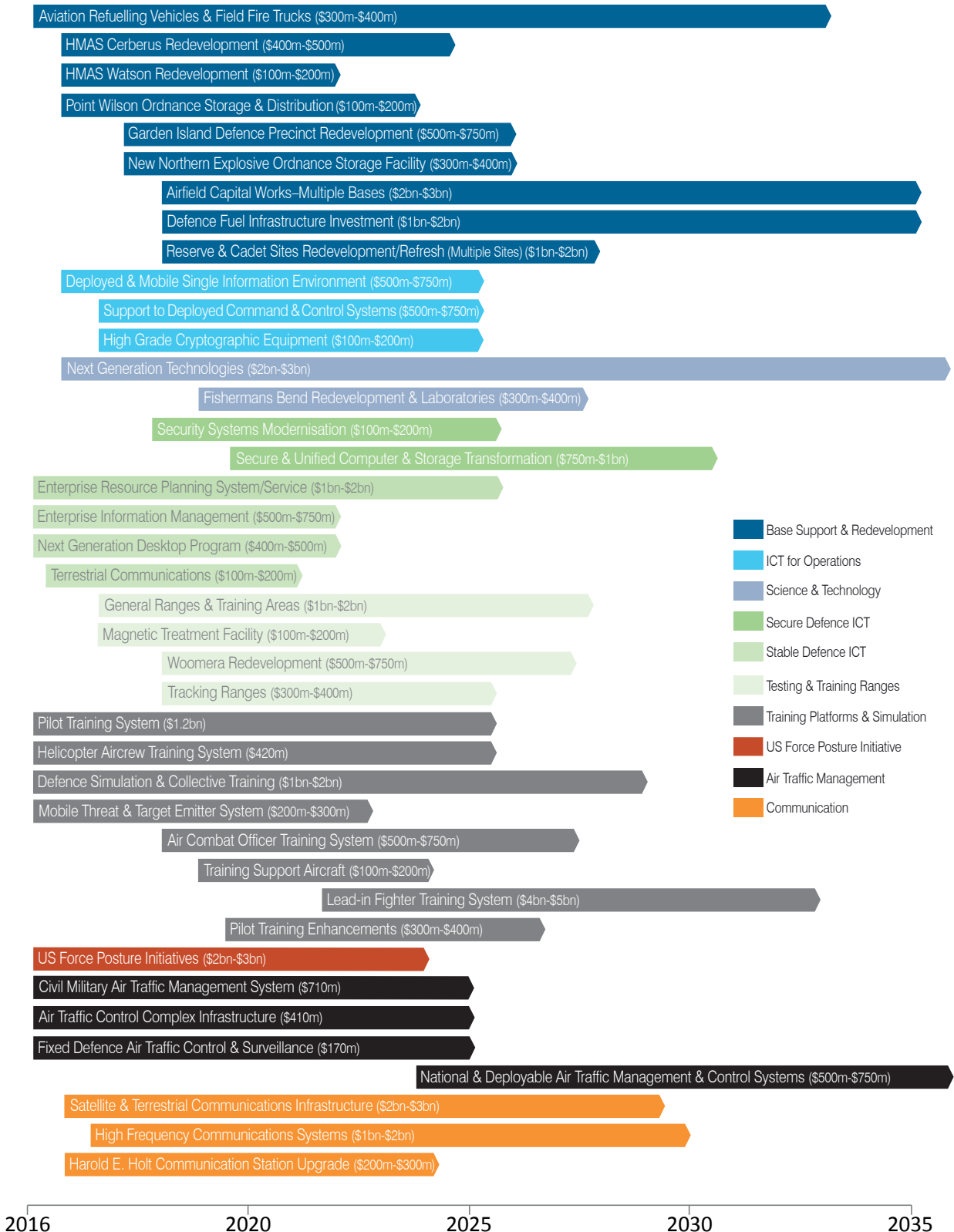




# Proposed Future Force (Key Enablers)

## Indicative Acquisition Windows of Key Approved & New Programs

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## ► Enabled, Mobile and Sustainable Forces

### Capability Stream: Key enablers

- 2.1 An important focus of the Force Structure Review was to remediate the underinvestment of recent years in those key enablers essential to realising the full potential of the high technology systems entering service. Over the decade to FY 2025–26, Defence will invest around 25 per cent of the Integrated Investment Program in strengthening the enablers required to maximise the effectiveness and operational sustainability of Australia's defence capability.
  - 2.2 Priorities for investment include:
    - continuously developing, monitoring and maintaining critical infrastructure, including airfields, wharves, port facilities, key ADF bases, logistics systems, fuel and explosive ordnance facilities
    - upgrading training and weapons ranges, testing facilities and health services (that enable training and exercises to support advanced weapons and systems and joint integration in realistic conditions)
    - enhancing the vast Defence information and communications technology system that supports Defence business from peacetime activities through to combat operations
    - strengthening force design, strategic and international policy development and international engagement that supports and sustains Defence operations and increased presence in the region.
-

- 2.3 Investing in the ADF and APS workforce through innovative and advanced education and training in the timeframes required will be essential for successful implementation of the capability and strategic goals of the Defence White Paper represented in this Integrated Investment Program. The Defence workforce is an essential enabler of existing and future capability.

### Key enablers workforce summary

- 2.4 As a result of the Force Structure Review's emphasis on strengthening enabling capabilities across the broad spectrum of Defence capabilities, the largest proposed area of increase in the Defence workforce is in the enabling function; around an additional 1100 ADF and 400 APS positions are required to support the enabler stream.
- 2.5 The principal areas of focus are:
- ▶ information and communications technology network support
  - ▶ logistics, operational and security support in Australia and at deployed locations
  - ▶ advanced joint training systems including enterprise modelling and simulation
  - ▶ training ranges and testing facilities
  - ▶ enhanced support to maritime logistics
  - ▶ integrated force design, analysis and assurance
  - ▶ strategic and international policy
  - ▶ expanded security vetting.

### Infrastructure and Defence estate

- 2.6 Facilities such as airfields, wharves, training areas, explosive ordnance storage, fuel installations and test and experimentation assets are critical for the generation and sustainment of Defence capability. Increased



investment in these facilities has been accorded a high priority in this Integrated Investment Program to ensure that these key enablers remain fit for purpose to support Defence operations.

- 2.7 The Defence estate (some 600 sites with around 30 000 assets) has a gross replacement value of approximately \$68 billion. Sustaining such a large and geographically dispersed asset base requires considerable funding for both maintenance and capital investment.
  - 2.8 The more capable, more active and internationally engaged future force will require significant additional investment in supporting infrastructure to enable us to meet our agreed strategic objectives, including the need to strengthen Defence's presence in northern Australia.
  - 2.9 Infrastructure requirements relating to our enhanced presence in northern Australia include upgrades to bases such as RAAF Tindal (Northern Territory), RAAF Learmonth (Western Australia), HMAS Coonawarra (Northern Territory) as well as to facilities on Cocos (Keeling) Islands. In addition, there are infrastructure requirements related to the United States Force Posture Initiative in northern Australia, along with a heightened program of military engagement including increased joint and multilateral training and exercises with other security partners. We also need to adapt to changes in land use within communities around Defence sites (leading to increasing encroachment of some facilities) along with environmental pressures.
  - 2.10 As a key enabler of Defence capability, our increased infrastructure investment will not be limited to expanding or remediating existing facilities. It will also involve modifying the Defence estate footprint to accommodate our new high technology capabilities and larger platforms, and to ensure that we are appropriately placed to meet future strategic requirements. Over the next 50 years, this will involve developing new bases, wharves, airfields and training and weapons testing ranges. Equally importantly, it will involve disposing of property and facilities that no longer meet our requirements.
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***Long-term infrastructure investment***

- 2.11 The Force Structure Review examined the strategic, longer-term requirements of the ADF, in terms of infrastructure and facilities to accommodate the high technology capabilities of the future force (including larger naval vessels), along with increased Defence activity, engagement and presence in the north.
- 2.12 Most of the expenditure on the longer-term initiatives listed below is programmed beyond 2026; this will allow time for the necessary planning, design and consultation with relevant stakeholders, in particular state and territory governments, industry and the broader community. Work will commence this decade on studies to inform the more detailed scope definition, environmental assessment and cost analysis work that will be essential to the successful progression of these initiatives.
- 2.13 These longer-term initiatives will not preclude urgent enhancement and maintenance works from being undertaken at existing facilities over the next decade. However, in planning and implementing any such work the longer-term goals outlined below will be taken into account.
- 2.14 Long-term infrastructure priorities include:
- ▶ developing long-term options to establish naval facilities with greater capacity in the Northern Territory to support Australia's larger future maritime force
  - ▶ adding loading capacity in the north, including options for a possible new roll-on/roll-off wharf in northern Australia to support our amphibious capability
  - ▶ developing options to enhance air base capacity in the Northern Territory to support the future ADF's air combat, intelligence, surveillance, reconnaissance, air-to-air refueller and air transport fleets, appropriately buffered from civil encroachment and with capacity to support visiting aircraft of allies and partners



- ▶ developing options for establishing a new Northern Advanced Joint Training Area with the capacity for large-scale, joint and combined amphibious training, noting the only other large-scale training area with joint amphibious training capacity is at Shoalwater Bay in Queensland
  - ▶ establishing a rail link from the main line to RAAF Tindal to support the transport and handling of explosive ordnance and bulk fuel; this will help to alleviate Defence's fuel storage and distribution limitations in the north.
- 2.15 The longer-term priorities outlined above involve substantial new investment in additional infrastructure and facilities in northern Australia to support the capability and capacity needs of a high technology future force and a more active posture. These priorities align with the Australian Government's policy to strengthen Defence's presence in northern Australia.
- 2.16 These proposals will support the future force's heightened engagement with allies and regional security partners, including the United States Force Posture Initiative. Importantly, the proposed infrastructure and facilities development in the north will address key existing vulnerabilities and capacity constraints that are set to worsen over time if not remedied.

#### ***Short to medium-term infrastructure investment***

- 2.17 The short to medium-term proposals below have been prioritised for increased investment, with the additional investment likely to be programmed within this decade to FY 2025–26 and into the following decade to FY 2035–36.

#### ***Advanced joint training systems, ranges and testing***

- 2.18 The current ranges and training areas are becoming degraded and in some cases are becoming increasingly not fit for purpose. A high priority in this Integrated Investment Program is to ensure that these

training and testing facilities are appropriately upgraded to support the introduction of new ADF weapons systems in the coming decades, as well as ADF electromagnetic warfare and intelligence, surveillance, and reconnaissance systems. This will allow more realistic training to take advantage of the full capacity of advanced weapons and systems. Integration with non-kinetic effects and simulation systems will also be a priority.

- 2.19 Advanced joint training systems will include platform simulators and systems that link multiple real life activities and simulators together to allow for large-scale joint training and mission rehearsal. An urgent priority for investment is the enterprise-wide simulation capability that will bring together all systems and data networks for an enhanced training capacity. An enterprise-wide simulation capability will improve both individual and collective ADF training outcomes by making training more realistic. It will also assist in deepening understanding of the full cost of ownership of capabilities. Some new platforms and systems for the future force will also require specific advanced simulation capabilities.
- 2.20 The pilot and air combat officer training systems will be upgraded to support more complex aircraft and aviation systems, including unmanned aircraft, and the increasing number of aerial platforms in the future force. The already approved Pilot Training System and Helicopter Aircrew Training System will provide an effective system for training the ADF's future pilots for various advanced aircraft types, supported by new modern training aircraft and the latest in simulator technology to enhance learning opportunities for student pilots. The Integrated Investment Program also includes a substantial provision for a new lead-in fighter training system to support those students who go on to complete the ADF's fast jet pilot training. Together these key investments will support the advanced pilot training requirements of the high technology future force, providing the flexibility and capacity to create a more efficient training pipeline.



- 2.21 Training range upgrades will include a variety of estate infrastructure; communications and environmental controls to manage training activities sustainably; new instrumentation, targets and threat simulation, to support more advanced training including with long-range and high-speed weapons; and infrastructure and equipment for maintaining target areas including for clearing of unexploded ordnance. Defence will increase investment over the next ten years to restore the training ranges and facilities required to support the existing force as well as supporting the introduction of larger, more capable and high technology platforms.
- 2.22 The Integrated Investment Program provides for further investment in a number of ADF training areas in northern Australia including for roads and accommodation; environmental measures such as fencing and waste management; through to the installation of advanced targeting including simulation and instrumentation in Shoalwater Bay (Queensland), Bradshaw Field Training Area (Northern Territory) and Yampi Sound (Western Australia) to better support joint training. Upgrades will also be undertaken at a range of ADF bases such as Lavarack Barracks (Queensland), Robertson and Larakeyah Barracks and RAAF Darwin (Northern Territory) which are used regularly in preparing forces.

***Key operational bases***

- 2.23 Many key existing ADF bases are in need of significant remediation or expansion, including Garden Island in Sydney. New platforms such as the *Canberra* Class amphibious ships and *Hobart* Class Air Warfare Destroyers will require more capable facilities. HMAS Stirling in Western Australia faces similar issues with larger vessels, and the expanded fleet of submarines. As the fleet becomes larger over the years, both in the number and size of ships (including planned larger vessels to replace the *Armidale* Class patrol boats), all naval bases will need attention.
- 2.24 Garden Island is currently the primary base that supports maritime operations from Australia's east coast. Defence assesses that Garden Island will need over \$700 million in works over the next ten years
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to enable it to continue to support an expanded fleet, including the *Canberra* Class amphibious ships. The works will include investment in the Captain Cook Graving Dock, East Dock Wharf, oil and gun wharves. Defence will undertake further work over the next few years to assess the longer-term feasibility of the Garden Island facility.

- 2.25 Substantial new investment in HMAS Stirling over the decade to FY 2025–26 will include the fire and damage control centre, wharf works not already included in the current redevelopment project, operations headquarters and underwater tracking range.
- 2.26 Defence will also carefully consider the future of RAAF Darwin and HMAS Coonawarra. Planned works to enhance operational effectiveness in the short to medium-term will continue ahead of the longer-term development of options for potentially establishing larger capacity bases in the Northern Territory.

### ***National airfields***

- 2.27 Additional investment in Defence and joint user (military/civilian) airfields has been programmed to address deficiencies and to ensure our modern aircraft are able to be supported. Upgrades will include runways, taxiways and hardstand refurbishments in line with risks identified through an annual program of inspections, along with airfield ground lighting upgrades and compliance works. A high priority has been placed on monitoring and maintenance to maintain the effectiveness of our airfields once they have been remediated.
- 2.28 To support the Joint Strike Fighter, new and upgraded facilities and infrastructure will be established over the course of this decade to FY 2025–26 at RAAF Bases Williamtown, Tindal, Townsville, Darwin, Curtin, Scherger, Learmonth, Pearce and Edinburgh.
- 2.29 To support the introduction of the new P-8A Poseidon maritime surveillance and response aircraft, RAAF Bases Edinburgh, Darwin, Pearce, and Townsville, and the airfield at the Cocos (Keeling) Islands will be upgraded.



***Explosive ordnance storage facilities***

- 2.30 The Explosive Ordnance Logistic Remediation Program will continue with the priorities being remediation of Point Wilson port infrastructure and Port Wakefield and Graytown proofing and experimentation facilities. Work will also be undertaken across numerous facilities to address legislative and regulatory compliance requirements including replacement of some ageing facilities. Work at Defence Establishment Myambat will also be conducted to support the introduction of new weapons including for the Joint Strike Fighter.
- 2.31 A new northern explosive ordnance storage facility will be constructed to address the capacity constraints of the sole explosive ordnance facility in the Northern Territory. The existing facility located at RAAF Darwin has limited scope for expansion but it will require some enhancements. The new explosive ordnance storage facility will better support the future force and enable higher tempo operations in northern Australia.

***Fuel supply***

- 2.32 The Defence fuel supply chain, including installations and infrastructure, is a key enabler for the generation of Defence capability. Fuel storage and distribution installations will be remediated to improve Defence's fuel resilience and capacity to transport bulk fuel to support its bases and operations. New investment programmed across the decade to FY 2025–26 includes upgrades to existing Defence fuel infrastructure and improved access to commercial fuel supplies, particularly to support high tempo operations in northern Australia. Airfield fuel trucks will be replaced and deployable fuel supply equipment for amphibious operations will also be upgraded.

***Support bases***

- 2.33 Support bases are important to house and train the ADF personnel of the future – they are often a recruit's first experience of military life. Modern training facilities and accommodation will support improved recruitment and retention and enhanced training capacity to support delivery of the future force.
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- 2.34 Some of the most important (albeit non-operational) bases are also amongst the least funded and in need of priority remediation, for example HMAS Cerberus. As non-operational bases, these facilities have typically been underfunded as priority for funding has gone to new capability or more operationally focused bases.

### ***Logistics***

- 2.35 The Defence Logistics Transformation Program will be completed in 2016 to transform Defence's logistics contracts, facilities and systems. The program is modernising and enhancing Defence wholesale storage, distribution and land materiel functions and providing enhanced logistics facilities at Moorebank (New South Wales), East Bandiana, (Victoria), Amberley and Townsville (Queensland), Palmerston (Northern Territory), Edinburgh (South Australia), and Guildford and HMAS Stirling (Western Australia).
- 2.36 Logistics information and communications technology systems will be rationalised and improved, particularly in Defence central cataloguing and the use of radio frequency identity technology, and by the introduction of a more comprehensive and integrated logistics enterprise resource planning suite.

### ***Woomera range complex***

- 2.37 The Woomera range complex is a critical national asset; it is an internationally unique facility able to support leading-edge systems. It provides a large, secure and remote training and testing area that could not be replicated anywhere else in Australia without major investment. Woomera is used largely by the Defence Science and Technology Group and the Air Force for testing and evaluating aeronautical weapons systems. With increased cooperation and joint exercises and training with the United States and other security partners, the demands on facilities such as Woomera are likely to increase. As such, additional investment is programmed within the decade to FY 2025–26 to ensure Woomera continues to support increasing demands.



***Advanced computing support to operational research and countermeasures development***

- 2.38 The increasing sophistication of modern high technology weapons systems and the growing complexity of the strategic environment, including emerging technologies and threats, are placing additional demand on our existing scientific and technical support base, including in the areas of operational research and countermeasures development. New investment will establish a centralised networked supercomputer capability that will support advanced research, development, modelling and experimentation across Defence.

***Maintenance***

- 2.39 Maintenance of the Defence estate, including measures to address workplace health and safety issues, has been underfunded in recent years. Over time, continued underfunding will lead to degradation of facilities and increased exposure of Australian Government personnel to workplace health and safety risk. Additional funding has been allocated in this Integrated Investment Program to allow Defence to address estate maintenance issues on a more systemic basis, thereby protecting the estate and its workforce and reducing the cost of future works. Substantial works will also be required at selected locations to remediate environmental issues.

***Reserves, cadets and other support sites***

- 2.40 The Reserves and cadets remain an important source of recruits for our permanent forces, and provide a tangible link to Defence in many communities across Australia. Investment in general refurbishments and compliance works across multiple establishments supporting Reserves and cadets, as well as other support sites, will continue over the decade to FY 2025–26. This will ensure that Reserves and cadets are provided with contemporary and safe environments.
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***Defence estate rationalisation***

- 2.41 Rationalisation and disposal of surplus sites is a priority for Defence. This activity is essential so that, over time, Defence can reshape its estate footprint to meet the ADF's future strategic requirements as efficiently and effectively as possible. Achieving a strategically aligned Defence estate footprint will gradually reduce the resources required to maintain facilities that are surplus to Defence's requirements. Additionally, any savings realised through the sale of Defence bases will be reinvested in Defence capability.

**Information and communications technology*****The Defence information and communications technology environment***

- 2.42 Information and communications technology is an essential enabler for the increasingly high-technology ADF and the Defence organisation more broadly. Defence is critically dependent on information and communications technology across the breadth of its activities, including command and control, intelligence, surveillance, reconnaissance, communications, electronic warfare, logistics, budgeting, personnel management and corporate administration.
- 2.43 Information and communications technology provides Defence with access to global communication channels and a complex range of specialist military, commercial, government and bespoke applications. Defence operates a wide variety of geographically dispersed, fixed, deployable and mobile networks that depend on access to modern and reliable information and communications-related equipment.
- 2.44 In addition to the challenges posed by its breadth and diversity, the Defence information and communications technology environment is also one of the largest in Australia: it currently supports more than 100 000 workstations across Australia and overseas. The current

environment of around 800 networks, over 200 processing locations, and more than 3000 applications needs to be streamlined substantially to more manageable levels to improve both the effectiveness and the efficiency of the domain.

***Remediating underinvestment in the Defence information and communications technology environment***

- 2.45 There has been underinvestment in key enablers over the decade, including in the area of information and communications technology. This underinvestment has been compounded by Defence's struggle to establish a coherent enterprise-level strategy for its complex and rapidly evolving information and communications technology domain.
  - 2.46 One of the highest priorities in the development of the Integrated Investment Program has been to address the systemic underinvestment in information and communications technology that has led to serious degradation across the network. Key areas of the network need urgent remediation, in particular to address the shortcomings of outdated and in some cases obsolete systems that inhibit the conduct of day-to-day business within Defence, with overseas allies and partners, and with industry and the community more broadly.
  - 2.47 While the process of remediation has commenced, the injection of substantial additional funding through the Integrated Investment Program is designed to consolidate early gains. It is also essential that Defence accelerates its efforts to modernise its information and communications technology infrastructure to take advantage of the rapidly advancing digital transformation that is occurring across the Australian economy more broadly. Defence will work with the Digital Transformation Office to ensure that Defence's plans reflect best practice.
  - 2.48 Defence will need to be more agile and flexible if it is to meet its information and communications technology requirements in the decade ahead effectively. As technology life cycles continue to shorten, it will be
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critical that Defence is able to move more quickly to acquire information and communications systems; this will ensure that Defence maintains a technological edge, while also simplifying maintenance and security.

***Priority areas of investment***

- 2.49 The priority areas for investment in Defence information and communications technology fall broadly into the following three categories:
- ▶ enhancing support to operations
  - ▶ stabilising Defence's information and communications technology core
  - ▶ delivering a rationalised, secure, contemporary information and communications technology environment.
- 2.50 These priority areas for investment in information and communications technology complement the work that is underway through the First Principles Review to modernise the way in which Defence plans and manages its information environment.
- 2.51 The Integrated Investment Program allocates more than \$5 billion in additional funding over previous plans to meet Defence's information and communications technology needs across the decade to FY 2025-26. This increase in funding will restore investment to the level needed to transform the fixed, deployed and mobile information and communications technology environments. The challenge that Defence faces in supporting its increasing needs for integrated, real-time, high performance, high capacity, secure and in some cases mobile information and communications systems is immense. Success will require careful planning and collaboration across the Defence organisation, close relationships with industry partners, and a preparedness to take judicious risks, especially in the more rapidly evolving areas of information and communications technology.



***Enhancing support to operations***

2.52 The major areas of proposed investment to support the ADF on operations include:

- ▶ the modernisation of command and control systems across the spectrum from strategic fixed locations (such as Headquarters Joint Operations Command in the Canberra region), through to tactical deployed formations (such as forces deployed overseas in the field or on ships)
- ▶ further investment in information systems that enable the ADF and the Defence organisation more broadly to communicate and exchange information with allies and partners, including across classified computer networks, and in both fixed and deployed environments
- ▶ substantial investment in emerging mobility and digitisation technologies that will be able to be applied in both the operational and non-operational environments – whether to support ADF elements on operations, logistics-related applications, or indeed corporate and administrative applications in the domestic environment
- ▶ enhanced computer network defence in support of deployed forces
- ▶ modernised health systems, including in support of deployed forces overseas.

***Stabilising Defence's information and communications technology core***

2.53 A critical step towards transforming Defence's information and communications technology environment will be to stabilise the core of the system by providing standardised, robust and reliable networks. The key initiatives to stabilise the core of the systems are the delivery of a Single Information Environment, and a program to transform Defence's information and communications technology core infrastructure, including through the following investments:



- ▶ a terrestrial communications project, which is upgrading, replacing and standardising the backbone of the Defence information and communications technology system
- ▶ the Next Generation Desktop project, which is improving the end user computing environment in Defence by delivering Defence networks and applications through a single desktop
- ▶ the Centralised Processing project, which is consolidating and updating Defence's computing infrastructure and re-hosting applications from around 280 data centres to 11 within Australia and 3 overseas; this project will address obsolescence, lack of standardisation and the current high costs of ownership of a distributed information and communications technology environment.



***Delivering a rationalised, secure, contemporary information and communications technology environment***

- 2.54 A rationalised, secure Defence information and communications technology environment will result in more efficient capabilities that reduce duplicated effort and allow for more secure data management and user access across required services and systems. Substantial work will be undertaken to consolidate, rationalise and simplify the current array of Defence applications. This program of work will also fund software remediation and improved enterprise licensing arrangements.
- 2.55 Continuous improvement activities over the decade to FY 2025–26 will include refreshing infrastructure periodically and enhancing the responsiveness of Defence information and communications technology support to meet future business needs and operational capability requirements.
- 2.56 Key priorities include:
- ▶ maintaining software and hardware standards that are adaptable to support the new high technology capabilities entering service

- ▶ developing and maintaining enterprise systems that support contemporary business practices
  - ▶ establishing trusted information sharing services to support Australian government agencies and allies in coalition operations.
- 2.57 As referred to earlier in the section on enhanced support to operations, investment in Defence's next generation mobile information and communications technology systems will improve mobility for Defence users by providing secure, effective and reliable mobile access to information in both the operational and business contexts.
- 2.58 Enhancements in Defence's information and communications technology systems and business processes to support the implementation of First Principles Review recommendations will include:
- ▶ establishing an Enterprise Information Management Program to enhance decision-making through access to a unified information environment, enabling improved information and data management across Defence
  - ▶ standardising business processes to provide end-to-end visibility of Defence business through streamlined processes and a consolidated Defence Enterprise Resource Planning system that will improve core business functions, including force preparedness planning
  - ▶ delivering an enterprise-wide framework for identity and access management to provide users with trusted access to applications, facilities and information and communications technology assets.

### ***Satellite and terrestrial communications infrastructure***

- 2.59 Defence will continue satellite-based communications upgrades, such as ground station segments and mobile and deployable land terminals. In doing this, we will ensure follow-on satellite communications projects

meet Australia's future bandwidth requirements and as is increasingly important, ensure our satellite communications capabilities provide secure communications, resilience and redundancy, along with high bandwidth communications capabilities.

- 2.60 Existing facilities at Harold E. Holt Communications Facility in Exmouth, Western Australia will also be upgraded over the decade to FY 2025–26. This will include infrastructure upgrades to support a space surveillance telescope that will be installed and set to work in this new facility in 2016.



### Next generation technologies: potential threats and opportunities

- 2.61 The relatively small size of the ADF and the Government's expectations that it will be able to conduct a wide range of operations, coupled with the increasingly sophisticated nature of military capability, makes the effective leveraging of science and technology a critical priority for Defence. Superior technology will often enable a smaller force to prevail over a larger adversary.
- 2.62 Science and technology is a key enabler of the ADF's operational capability. Investment in science and technology helps to ensure the ADF remains resilient to emerging threats, including the possible use of disruptive technologies by adversaries. It also enables us to be innovative and to take advantage of new or developing areas of technology that have the potential to provide a capability edge for Australia's relatively small force. A high priority has been placed on strengthening Defence's ability to understand and respond to potentially game-changing next generation science and technology-related threats and opportunities, including through targeted investment to support specific areas of research and advanced systems development. This will be a key component of the enduring force design process to be introduced through the implementation of First Principles Review recommendations.

- 2.63 The Integrated Investment Program includes a program of work to enable Defence to better understand and respond to potential threats and opportunities. Around \$730 million has been allocated over the decade to FY 2025–26 to support targeted science and technology. The key drivers likely to influence development of the future force from a science and technology perspective include:
- ▶ increasing global threats in cyber and electronic warfare domains
  - ▶ increasing global access to technology necessitating a capability edge derived through decision-making superiority and enhanced human performance
  - ▶ the need for agile, evolutionary upgrade of military equipment to keep pace with technology advances and evolving (often asymmetric) threats
  - ▶ the force multiplier effect of a highly adaptable and integrated joint force
  - ▶ the need for more persistent, pervasive and timely intelligence, surveillance, and reconnaissance capabilities
  - ▶ the significant advantage that could be achieved by reducing the cost of force preparedness and sustainment while increasing force availability.
- 2.64 Early application of science and technology reduces the cost, technical and capability risks of procuring systems and introducing these systems into service. Science and technology is essential to support the ADF on operations, sustain and enhance current capability, acquire new capability and future-proof against emerging threats.
- 2.65 Appropriate investment in science and technology will enable Defence to prevent technology surprise, solve technical capability challenges and provide cost-effective access to global science and technology advances for the ADF. Our investment in Defence science and technology will also enhance Australia's performance as a smart developer, buyer, user, maintainer and upgrader of Defence equipment,
-

and extend opportunities for greater collaboration with our allies and international security partners.

2.66 Examples of priority areas of work are outlined below:

- ▶ integrated intelligence, surveillance, and reconnaissance – effective enterprise intelligence, surveillance, reconnaissance integration and interoperability with our allies will provide a capability edge through superior battlespace awareness
- ▶ space systems – de-risking Defence's dependence on space-based systems through technical expertise and enhanced capability agility
- ▶ enhanced human performance – including enhancing soldiers' resilience and data interpretation abilities
- ▶ medical countermeasure products – establishing and coordinating a national infrastructure for the rapid development of medical countermeasure products to provide effective protection of Defence personnel from a range of chemical, biological and radiological threats, pandemics and emerging infectious diseases
- ▶ multi-disciplinary materiel systems – investigating technological advances to reduce detection of ADF platforms and improve ballistic and shock protection
- ▶ quantum technologies – including increasing the security of military and government communications and computing through strengthened encryption
- ▶ trusted autonomous systems – researching developments in trusted autonomous systems that may have the potential to support ADF capability in the future, such as the use of autonomous vehicles for resupply
- ▶ cyber operations – establishing a research and development capability to address the threats presented by information and communications technology dependencies and vulnerabilities within military systems



- ▶ new technologies – researching technologies emerging globally, including advanced sensors, hypersonic and directed energy technologies, to remain informed of potential future threats or opportunities.

Defence Posture – more active and internationally engaged

- 2.67 A more active and internationally engaged Defence posture will involve an increased operational tempo for the ADF and its enabling elements, in particular in support of the government-agreed strategic direction for international engagement.
- 2.68 Defence will conduct a broader and deeper program of engagement with international partners, with a focus on maritime South East Asia and the South Pacific, to take a more active role in shaping Australia’s strategic environment. This will involve a proactive pattern of peacetime activities, exercises and operations in the region, with priority on South East Asia and the South Pacific.

Table 4: Summary of key investment decisions from FY 2016–17 to FY 2025–26		
Program title	Program Timeframe	*Approximate investment value
Pilot Training System	Approved	\$1.2bn
Civil Military Air Traffic Management System	Approved	\$710m
Identification Friend or Foe and Automatic Dependent Surveillance Systems	Scheduled for approval†	\$400m–\$500m
Pacific Patrol Boat Replacement	Scheduled for approval†	\$500m–\$750m
Helicopter Aircrew Training System	Approved	\$420m
Air Traffic Control Complex Infrastructure	Approved	\$410m
Next Generation Desktop Program	Scheduled for approval†	\$400m–\$500m
Large Aircraft Self Protection – Infrared Countermeasures	Approved	\$240m
Fixed Defence Air Traffic Control and Surveillance	Approved	\$170m
Lead-In Fighter Capability Upgrade	Approved	\$160m

Program title	Program Timeframe	*Approximate investment value
Aviation Refuelling Vehicles and Field Fire Trucks	Scheduled for approval†	\$100m–\$200m
Terrestrial Communications	2016–2020	\$100m–\$200m
HF Modernisation Project	Approved	\$111m
Enterprise Resource Planning System/Service	Scheduled for approval†	Less than \$100m
Defence Simulation and Collective Training	Scheduled for approval†	Less than \$100m
Lead-in Fighter Training System	2022–2033	\$4bn–\$5bn
US Force Posture Initiatives	2016–2024	\$2bn–\$3bn
Satellite and Terrestrial Communications	2016–2029	\$2bn–\$3bn
Next Generation Technologies	2016–2036	\$2bn–\$3bn
Airfield Capital Works – Multiple Bases	2018–2035	\$2bn–\$3bn
Defence Simulation and Collective Training	2016–2028	\$1bn–\$2bn
Enterprise Resource Planning System/Service	2016–2025	\$1bn–\$2bn
General Ranges and Training Areas	2017–2027	\$1bn–\$2bn
High Frequency Communications Systems	2017–2030	\$1bn–\$2bn
Defence Fuel Infrastructure Investment	2018–2035	\$1bn–\$2bn
Reserve and Cadet Sites Redevelopment/Refresh (Multiple Sites)	2019–2025	\$1bn–\$2bn
Deployable Health Capability	2016–2025	\$750m–\$1bn
Secure and Unified Computer and Storage Transformation	2020–2030	\$750m–\$1bn
Deployed and Mobile Single Information Environment	2016–2025	\$500m–\$750m
Garden Island Defence Precinct Redevelopment	2017–2025	\$500m–\$750m
Support to Deployed Command and Control Systems	2017–2025	\$500m–\$750m
Air Combat Officer Training System	2018–2026	\$500m–\$750m
Woomera Redevelopment	2018–2026	\$500m–\$750m
National and Deployable Air Traffic Management and Control Systems	2023–2031	\$500m–\$750m
Enterprise Information Management	2016–2021	\$400m–\$500m
HMAS Cerberus Redevelopment	2016–2024	\$400m–\$500m
Deployable Force Infrastructure	2017–2026	\$300m–\$400m
Explosive Ordnance Facilities and Munitions	2017–2027	\$300m–\$400m
New Northern Explosive Ordnance Storage Facility	2017–2023	\$300m–\$400m
Tracking Ranges	2018–2025	\$300m–\$400m
Fishermans Bend Redevelopment and Laboratories	2019–2024	\$300m–\$400m
Pilot Training Enhancements	2022–2025	\$300m–\$400m



Program title	Program Timeframe	*Approximate investment value
Enterprise Wide Services Oriented Architecture	2016–2026	\$200m–\$300m
Mobile Threat and Target Emitter System	2016–2021	\$200m–\$300m
Explosive Ordnance Logistics Reform Program	2016–2020	\$200m–\$300m
Harold E Holt Communication Station Upgrade	2016–2024	\$200m–\$300m
Data Centre Capability Improvement	2020–2025	\$200m–\$300m
Aviation Refuelling Vehicles and Field Fire Trucks	2021–2032	\$200m–\$300m
HMAS Watson Redevelopment	2016–2021	\$100m–\$200m
Point Wilson Ordnance Storage and Distribution	2016–2021	\$100m–\$200m
RAAF Williams – Point Cook Redevelopment	2016–2021	\$100m–\$200m
Joint Health Command Redevelopment	2017–2020	\$100m–\$200m
Magnetic Treatment Facility	2017–2022	\$100m–\$200m
High Grade Cryptographic Equipment	2017–2025	\$100m–\$200m
Security Systems Modernisation	2018–2025	\$100m–\$200m
Training Support Aircraft	2019–2024	\$100m–\$200m
Health Systems Modernisation	2021–2026	\$100m–\$200m
End User Interface	2021–2026	\$100m–\$200m
Secure Information Environment at Sea	2016–2025	Less than \$100m
Remediation of Single Point of Failure	2016–2026	Less than \$100m

\*The figures in the table cover the acquisition element of the programs. There will be additional investment in whole-of-life sustainment and operating costs for each program. All figures are calculated on an out-turned price basis.

†Project scheduled for approval in FY 2015–16.



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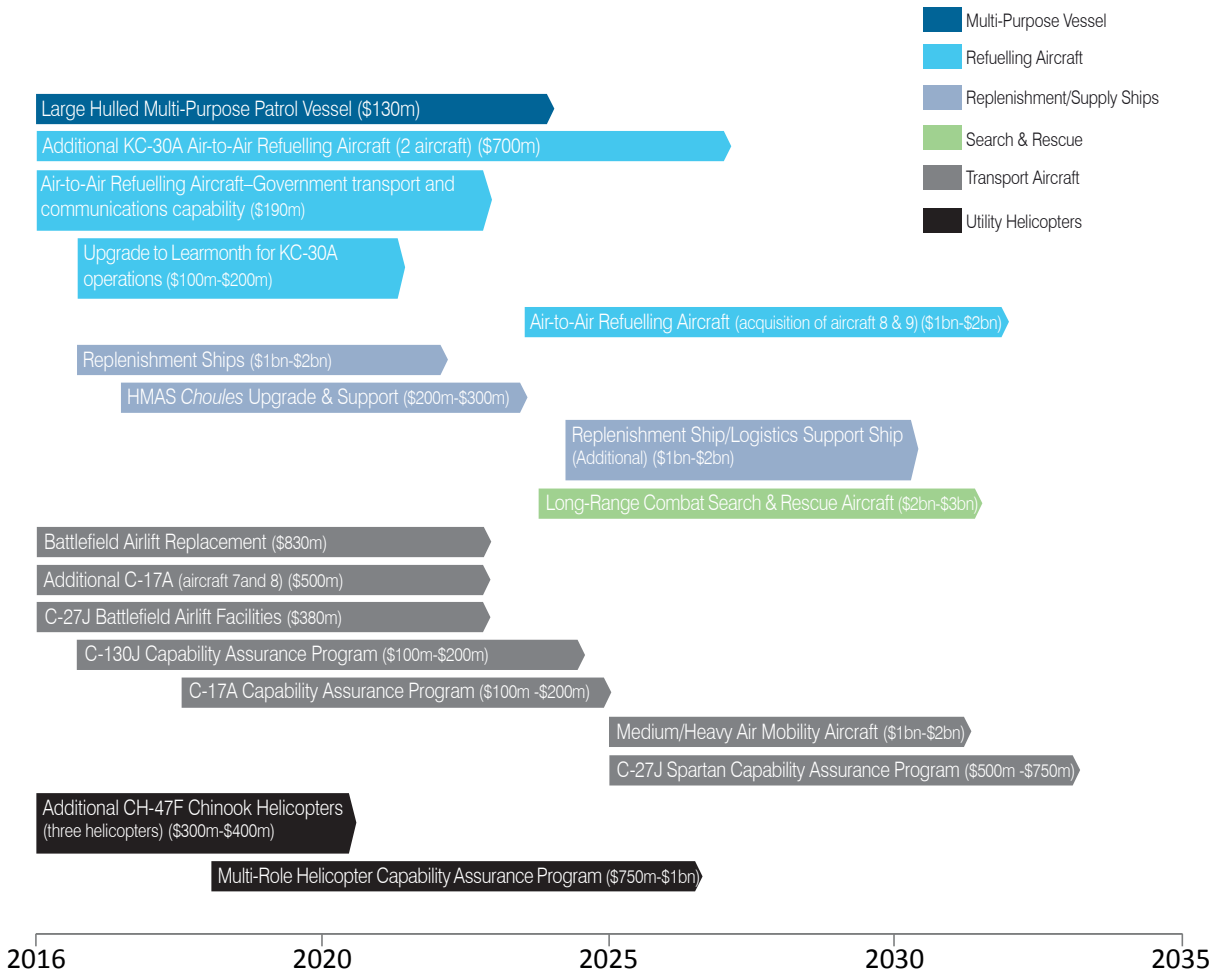
# ENABLED, MOBILE AND SUSTAINABLE FORCES

CAPABILITY STREAM: AIR AND SEA LIFT



## Proposed Future Force (Air & Sea Lift)

### Indicative Acquisition Windows of Key Approved & New Programs



## ► Enabled, Mobile and Sustainable Forces

### Capability Stream: Air and sea lift

- 3.1 Over the decade to FY 2025–26, Defence will invest around six per cent of the Integrated Investment Program into enhancing Australia’s air and sea lift capabilities.
  - 3.2 Given the substantial distances over which the ADF must operate – nationally, regionally and globally – air and sea lift capabilities are essential. A flexible force of air and sea lift capabilities will enable the ADF to reach, resupply, and sustain missions in different locations and to move around the area of operations in a timely and reliable manner. The growth in Defence capabilities (including personnel numbers, and the size and weight of equipment) will place additional pressures on these capabilities. Enhancements underway in Defence logistic support systems and facilities will enable better use of technology in our resupply and maintenance processes, and this will ultimately improve support to ADF operations.
  - 3.3 The existing capabilities and approved acquisitions that contribute to air and sea lift are:
    - transport aircraft (8 C-17A Globemaster III, 12 C-130J Hercules and 10 C-27J Spartans)
    - air-to-air refuelling aircraft (7 KC-30A Tankers)
    - helicopters (7 CH-47F Chinooks and 47 MRH-90 Troop lift helicopters)
    - a logistics support ship (HMAS *Choules*)
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- ▶ acquisition of a new large-hulled multi-purpose patrol vessel, the Australian Defence Vessel *Ocean Protector*, for the Navy to support border protection and maritime resource security-related tasks with the Australian Border Force.
- 3.4 The *Canberra* Class amphibious ships can also provide substantial support for sea lift as a secondary role.
- 3.5 New investments in this capability stream include:
  - ▶ additional air-to-air refuellers
  - ▶ acquiring three additional Chinooks to expand battlefield lift capacity and support tactical missions (including aero-medical evacuation)
  - ▶ 2 new replenishment vessels with an additional vessel (a replenishment ship or logistics support vessel) to be acquired in the late 2020s
  - ▶ extending the life of, and upgrading HMAS *Choules*
  - ▶ considering future additional heavy-lift transport aircraft.
- 3.6 In the longer-term, consideration will be given to acquiring a long-range, aero-medical evacuation and combat search and rescue capability.

### ***Air and sea lift workforce summary***

- 3.7 As a result of enhancements to the current and planned air and sea lift fleets around 800 additional ADF positions will be needed to support:
  - ▶ two additional Globemaster heavy-lift aircraft (already approved), with further aircraft to be acquired in the future
  - ▶ two additional KC-30A air-to-air refuelling aircraft (already approved), with a further two aircraft to be acquired in the future
  - ▶ ten C-27J Spartan aircraft



- ▶ two new large replenishment ships by 2026, with an additional replenishment ship or logistics support vessel to be acquired in the late 2020s
- ▶ three additional Chinook helicopters.

### ***Air and sea lift infrastructure summary***

- 3.8 Substantial investment in support of air lift is programmed for upgraded infrastructure at RAAF Amberley, Queensland, including facilities to support an increased number of tactical, medium and strategic lift aircraft. Funding is also programmed for works at RAAF Base Richmond, New South Wales, in the latter years of the decade to FY 2025–26.
- 3.9 Australia's growing sea lift capability will be supported by planned upgrades to wharves and port facilities, including substantial investment in Fleet Base East (such as the Garden Island (East) Redevelopment Critical Infrastructure Remediation Project), combined with continued commercial arrangements for ADF access to civilian infrastructure.

### ***Transport aircraft***

- 3.10 The Globemaster, Hercules and Spartan capabilities collectively provide strategic and intra-theatre air lift and movement around Australia and the world, as well as facilitating airborne operations and aero-medical evacuation. This combination of aircraft will provide a capable and flexible air lift fleet to at least 2030.
- 3.11 The eight Globemasters (and any additional heavy-lift aircraft in the future) are capable of moving large cargo and numbers of personnel great distances, such as from Australia to the Middle East. These aircraft will be upgraded in the mid-2020s to ensure that they remain at the leading edge in terms of communications, sensors and self-protection capabilities as these aircraft will continue to operate into the 2030s. These upgrades will align with the United States' Air Force capability to the greatest possible extent, and the aircraft will continue to be maintained through the global support program.

- 3.12 The existing aircraft support and loading infrastructure at a range of air bases across Australia will be expanded to accommodate the additional heavy-lift aircraft capacity and associated equipment. This will include new hangars, tarmac and aprons, and new facilities to support additional squadron and base support personnel at RAAF Amberley. Other bases and airfields will also require upgrades in coming years to accommodate the increase in aircraft cargo volume and activity levels.
- 3.13 The 12 Hercules are ideally suited to moving stores and equipment within the region and are capable of operating from austere airfields. The Hercules upgrades will, to the greatest extent possible, align with the United States' Air Force capability to ensure it remains current and to reduce upgrade and support costs.
- 3.14 Ten Spartans are currently being acquired and will allow movement of personnel and small cargos to remote locations as they are capable of using shorter landing strips not suitable for any other fixed wing military aircraft. This is particularly useful if operating from countries in the South Pacific and in Papua New Guinea. The new Spartan fleet will be based at RAAF Amberley; facilities will be enhanced to support the new aircraft, which are expected to remain in service until around 2040. Defence will seek opportunities to maintain the aircraft in common with other users, where possible, to reduce upgrade costs throughout its life.

#### ***Air-to-air refuelling***

- 3.15 The range and number of ADF aircraft that the KC-30A air-to-air refueller aircraft will be able to refuel in flight is increasing and will include the Joint Strike Fighter, Super Hornets, Growlers, Wedgetail, other air-to-air refuellers, Globemasters and Poseidon.
- 3.16 The current ADF air-to-air refuelling capability, including a recently approved acquisition of two additional aircraft, comprises a fleet of seven air-to-air refuellers, with future consideration to expand the fleet to nine aircraft to meet increasing demand.



- 3.17 The air-to-air refuelling fleet will undergo systems software and hardware upgrades (including to the aircraft's self-protection systems) throughout its life to ensure its safe and effective operation.
- 3.18 The current air-to-air refuellers are larger, heavier and capable of carrying more fuel than their predecessors. To ensure the aircraft are able to operate to their full potential to support refuelling operations (by taking off with a full fuel-load in hot weather) RAAF bases Learmonth and Tindal will need to be upgraded by strengthening and lengthening the runways. The fuel infrastructure at both bases will also need to be upgraded to ensure sufficient fuel is available and the means to refuel the aircraft efficiently is in place.
- 3.19 At the air-to-air refuellers' home base at RAAF Amberley, additional facilities will be required to support the increased number of aircraft and associated personnel. These include:
- ▶ accommodation
  - ▶ maintenance facilities
  - ▶ fuel storage
  - ▶ tarmac and hangar modifications.

### ***Utility helicopters***

- 3.20 The Chinook heavy-lift and MRH-90 Troop lift helicopters provide a range of functions to the joint force including logistics support, tactical mobility and limited fire support and reconnaissance. The Chinooks predominately support the land force (including amphibious operations) in moving heavy equipment around the battlefield and undertaking tactical aero-medical evacuation, while the MRH-90 helicopter is operated by Army for tactical air mobility and by Navy as a maritime



support helicopter. The MRH-90 helicopters will continue to be introduced into service, with Army operating 39 to 41 aircraft and Navy operating 6 to 8 aircraft.

- 3.21 The Chinook is capable of moving stores and personnel, including vehicles and artillery systems, around the battlefield or from ships to the land without the need for an airfield. A new Chinook fleet is currently being acquired: seven CH-47F Chinooks will replace our seven CH-47D. Three additional CH-47F aircraft will be acquired in the near term to provide a fleet of ten new Chinooks.
- 3.22 During its life, the CH-47F fleet will be upgraded as required to ensure that our aircraft remain supportable through the United States logistic system.
- 3.23 The Government will enhance the ADF's aero-medical evacuation capability, commencing with the acquisition of new aero-medical evacuation equipment for the additional Chinook helicopters in the decade to FY 2025–26 and through ensuring appropriate obsolescence management of the entire Chinook fleet. In the longer-term, Defence will explore options for a long-range, aero-medical evacuation and combat search and rescue aircraft to provide enhanced support to ADF operations, including operating with the amphibious ships.

### ***Replenishment ships***

- 3.24 Two new replenishment ships will replace the current mixed fleet of one replenishment ship and one oiler (fuel only) by the early 2020s. Replenishment ships are able to resupply fuel, water, food and weapons to ships at sea to extend their range and endurance. As the surface fleet grows with the introduction of larger frigates and larger patrol vessels, Defence will acquire another support vessel such as a third high-capacity replenishment ship or an additional logistics support ship similar to HMAS *Choules* in the late 2020s. A third replenishment ship would



provide an assured capacity to continuously generate one operationally available replenishment ship for Surface Task Group operations.

- 3.25 While primarily capable of providing fuel, water and stores to combat forces underway at sea, replenishment ships are also able to transport stores into an operational theatre by helicopter and watercraft and can discharge stores and fuel ashore via established port infrastructure.
- 3.26 The new replenishment ships will be fitted with situational awareness and communications capabilities along with semi-autonomous point-defence against air and surface weapon threats and torpedo defences. This will allow them to be integrated effectively into task group operations, while also retaining a level of independence for missions that do not require continuous escort for their protection.

#### ***Logistics support ship***

- 3.27 Defence will upgrade and extend the life of the ADF's logistics support ship HMAS *Choules*, which is capable of undertaking a range of tasks across the spectrum of military operations from providing humanitarian assistance and disaster relief to amphibious lodgement. Planned investment includes:
  - ▶ updating the ship's battle management and command, control, communications, computers and intelligence capabilities to enable it to work effectively with the *Canberra* Class amphibious ships
  - ▶ fitting self-defence systems for protection against torpedoes, anti-ship missiles and fast attack craft
  - ▶ fitting aviation support systems.
- 3.28 The Integrated Investment Program also provides for the replacement of this logistics support ship around 2030, as HMAS *Choules* has demonstrated the benefits of this type of vessel in extending the reach of the ADF and enhancing our capacity to deploy larger

and better-equipped forces. HMAS *Choules*, together with the two *Canberra* Class amphibious ships, will provide scalable and flexible options for greater capacity sea lift and amphibious operations. A third replenishment ship or additional logistics support ship will be considered in the late 2020s.

- 3.29 The recent acquisition of a new large-hulled multi-purpose patrol vessel, the Australian Defence Vessel *Ocean Protector*, to support border protection and maritime resource security-related tasks will add further capacity to complement the Navy's logistics support capability.
- 3.30 This capability will be supported by upgrades to Fleet Base East, including the Garden Island (East) Redevelopment Critical Infrastructure Remediation Projects.

Table 5: Summary of key investment decisions from  
FY 2016–17 to FY 2025–26

Program title	Program Timeframe	*Approximate investment value
Battlefield Air lift Replacement	Approved	\$830m
Additional KC-30A Air-to-Air Refuelling Aircraft (2 aircraft)	Approved	\$700m
Additional C-17A (aircraft 7 and 8)	Approved	\$500m
C-27J Battlefield Air lift Facilities	Approved	\$380m
Replenishment Ships	Scheduled for approval†	\$1bn–\$2bn
Additional CH-47F Chinook Helicopters (three helicopters)	Scheduled for approval†	\$300m–\$400m
Air-to-Air Refuelling Aircraft – Government transport and communications capability	Approved	\$190m
Australian Defence Vessel <i>Ocean Protector</i> , Large-Hulled Multi-Purpose Patrol Vessel	Approved	\$130m
Long-range Combat Search and Rescue Aircraft	2023–2032	\$2bn–\$3bn
Air-to-Air Refuelling Aircraft (acquisition of aircraft 8 and 9)	2023–2031	\$1bn–\$2bn
Replenishment Ship/Logistics Support Ship (additional)	2024–2030	\$1bn–\$2bn
Medium/Heavy Air Mobility Aircraft	2025–2031	\$1bn–\$2bn



Program title	Program Timeframe	*Approximate investment value
Multi-Role Helicopter Capability Assurance Program	2019–2026	\$750m–\$1bn
C-27J Spartan Capability Assurance Program	2025–2032	\$500m–\$750m
RAAF Richmond Redevelopment	2021–2026	\$300m–\$400m
HMAS <i>Choules</i> Upgrade and Support	2017–2023	\$200m–\$300m
C-130J Capability Assurance Program	2016–2025	\$100m–\$200m
Upgrade to Learmonth for KC-30A Operations	2016–2021	\$100m–\$200m
C-17A Capability Assurance Program	2018–2025	\$100m–\$200m

\*The figures in the table cover the acquisition element of the programs. There will be additional investment in whole-of-life sustainment and operating costs for each program. All figures are calculated on an out-turned price basis.

†Project scheduled for approval in FY 2015–16.

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# POTENT AND AGILE OFFENSIVE RESPONSE

CAPABILITY STREAM: MARITIME AND  
ANTI-SUBMARINE WARFARE



## Proposed Future Force (Maritime & Anti-Submarine Warfare)

### Indicative Acquisition Windows of Key Approved & New Programs



## ► Potent and Agile Offensive Response

### Capability Stream: Maritime and anti-submarine warfare

- 4.1 Over the decade to FY 2025–26, Defence will invest around 25 per cent of the Integrated Investment Program to enhance Australia's maritime and anti-submarine warfare capabilities.
  - 4.2 A force that is able to conduct more challenging maritime warfare operations in the broader region will improve Defence's ability to meet future operational demands, including a greater contribution to theatre anti-submarine warfare operations in our region. This includes the ability to conduct a spectrum of tasks ranging from border security and hydrographic survey, through to patrols, anti-piracy operations and combat at sea. Australia's maritime force will become more potent over the next two decades through acquiring higher capability systems and better integration of sea and air platforms.
  - 4.3 Existing capabilities and approved acquisitions that contribute to Australia's maritime and anti-submarine warfare capabilities include:
    - the *Collins* Class submarine fleet, which will be upgraded to ensure that it remains a potent capability through the rest of its life
    - 8 P-8A Poseidon maritime surveillance and response aircraft
    - Seahawk naval combat helicopters
    - sensor, weapons and combat system upgrades to the *Anzac* Class frigates and the *Hobart* Class Air Warfare Destroyers
    - the current fleet of *Armidale* Class patrol boats supplemented by additional patrol boats as required.
-



- 4.4 New investments to build the capability and capacity of our maritime force include:
- ▶ 12 regionally superior submarines to replace Australia's existing fleet of 6 *Collins* Class submarines
  - ▶ 9 anti-submarine warfare frigates to replace Australia's existing fleet of 8 *Anzac* Class frigates
  - ▶ 12 patrol vessels capable of more extended operations than the existing *Armidale* Class patrol boats
  - ▶ initially an additional 4 Poseidon aircraft, with 3 further aircraft in the late 2020s to bring the total to 15
  - ▶ modernised mine countermeasures and an efficient combination of military and commercial hydrographic survey capabilities
  - ▶ a new deployable land-based anti-ship missile capability.
- 4.5 The scale and complexity of the transformation that will take place across Defence's maritime and anti-submarine warfare capabilities over the next several decades will be unprecedented. When taken together, the projects to replace our existing fleets of submarines, frigates, destroyers and patrol boats will be worth well over \$100 billion dollars over multiple decades for the acquisition phases alone. The level of planning, management and workforce skills that will be required to deliver this program of investment will challenge Australia and our international partners. A whole-of-nation, whole-of-industry and whole-of-capability approach across all the fundamental inputs to capability – including workforce and infrastructure, both in Defence and industry, will be required for Australia to succeed in this massive endeavour.
- 4.6 The Government's strategy for a permanent naval shipbuilding industry in Australia is centred on a long-term continuous build of surface warships and smaller naval vessels in Australia. Following completion of



a competitive evaluation process, the continuous shipbuilding strategy will commence in 2018 with offshore patrol vessels, and in 2020 for the future frigates.

- 4.7 Both Defence and Australian industry will have a heavy workload to deliver, upgrade and sustain Australia's future maritime force. A challenge will be to successfully manage the transition between the existing and new submarine, frigate and patrol boat fleets, in particular ensuring the continued availability of required capabilities to meet the Government's tasking. Strategic planning across programs of work over several decades, as opposed to the past project-by-project approach, will be essential in meeting this challenge.

***Maritime and anti-submarine warfare workforce summary***

- 4.8 The scale and complexity of the planned investment in maritime and anti-submarine warfare capabilities is immense. The substantially larger maritime and anti-submarine warfare force will require an increase of around 800 ADF positions in the decade to FY 2025–26. Submarines and ships are ineffective without highly skilled crews. The people who operate these platforms are as important as the platforms themselves. The doubling in size of our submarine fleet over the next 30 or so years will present a real challenge for Defence and for the Australian community more broadly. A high priority will be accorded to the effective development of the crews and support personnel, and their partners in industry, who will be indispensable for the operation of these capabilities in the decade to FY 2025–26. Beyond that decade, further increases in workforce numbers will be needed as the various fleets expand.
- 4.9 Increasing ADF personnel numbers in this capability stream over the course of the decade to FY 2025–26 and beyond will support:
- ▶ the *Hobart* Class Air Warfare Destroyers
  - ▶ 7 additional Poseidon aircraft which will take the fleet to 15 aircraft in the late 2020s
  - ▶ the future frigate fleet
-

- ▶ a larger submarine fleet
- ▶ tactical unmanned intelligence, surveillance, and reconnaissance aircraft systems to be deployed from a range of ships
- ▶ a deployable land-based anti-ship missile capability.

### ***Maritime and anti-submarine warfare infrastructure summary***

- 4.10 Over the decade to FY 2025–26, substantial investment is programmed for infrastructure works to support the ADF's maritime and anti-submarine warfare capabilities. This includes new facilities or upgrades to wharves and ports infrastructure, runway extensions and other airfield upgrades, and major base accommodation and facilities upgrades at a number of naval establishments. These infrastructure and facilities works are needed to support the larger (in both platform size and number) surface and sub-surface fleets entering service now and over the coming decades. Infrastructure works at Cocos (Keeling) Islands and RAAF Edinburgh, South Australia, are also needed to ensure these airfields and associated facilities can support new capabilities such as the fleet of Poseidon aircraft. Substantial funding is programmed for urgent works at Fleet Base West (HMAS Stirling) and Fleet Base East (Garden Island).

### ***Submarines***

- 4.11 Submarines are an essential part of Australia's naval capability, providing a strategic advantage in terms of surveillance and protection of our maritime approaches. The Government has determined that regionally superior submarines with a high degree of interoperability with the United States are required to provide Australia with an effective deterrent, including by making a meaningful contribution to anti-submarine warfare operations in our region. The key capabilities of the future submarine will include: anti-submarine warfare; anti-surface warfare; intelligence, surveillance and reconnaissance; and support to special operations.



- 4.12 The Government will increase the size of the submarine force from 6 to 12 boats. The doubling in size of the submarine fleet recognises that Australia will face a more challenging maritime environment in the decades ahead. By 2035, around half of the world's submarines will be operating in the Indo-Pacific region where Australia's interests are most engaged. Australia has one of the largest maritime domains in the world and we need the capacity to defend and further our interests from the Pacific to the Indian Oceans and from the areas to our north to the Southern Ocean. Submarines are a powerful instrument for deterring conflict and a potent weapon should conflict occur.
  - 4.13 Australia's new submarines will be supported by upgrades to enablers and facilities such as wharves and port facilities, as well as simulators, training and submarine rescue systems. The key strategic requirements for the future submarines include a range and endurance similar to the *Collins* Class submarine, sensor performance and stealth characteristics which are superior to the *Collins* Class, and upgraded versions of the AN/BYG-1 combat system and Mark 48 MOD 7 heavyweight torpedo jointly developed between the United States and Australia as the preferred combat system and main armament. The new submarines will have advanced communications systems to link with other Navy ships and aircraft to conduct anti-submarine warfare operations.
  - 4.14 The acquisition of the 12 future submarines will commence in 2016 with the first submarines likely to begin entering service in the early 2030s. Construction of the 12 new submarines will extend into the late 2040s to 2050 timeframe. The length of the construction process will mean that Australia will need to be planning the follow-on submarine well before the last new submarine enters service. To ensure no capability gap and the ability to progress development of a replacement submarine in the 2050s, the Government has decided to implement a rolling acquisition program for Australia's submarine fleet. A rolling acquisition program will ensure that Australia is able to maintain a fleet of 12 regionally
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superior submarines as submarine and anti-submarine technologies develop over the coming decades.

- 4.15 During the long life of the new submarines, the rapid rate of technological change and ongoing evolution of Australia's strategic circumstances will continue. As part of the rolling acquisition program, a review, based on strategic circumstances at the time and developments in submarine technology, will be conducted in the late 2020s to consider whether the configuration of the submarines remains suitable or whether consideration of other specifications should commence.
- 4.16 The Future submarine program is the largest defence procurement program in Australia's history. The Government has already committed to maximising Australian industry involvement in the submarine program, without compromising cost, capability, schedule or risk. The Government will announce the results of a Competitive Evaluation Process in 2016.
- 4.17 The Integrated Investment Program also prioritises investment in the existing *Collins* Class fleet, including priority capability enhancements, obsolescence management and fleet sustainment, to ensure Australia's potent and agile submarine capability is maintained through the transition period to the introduction of the future submarine fleet. A continual and relentless focus on ensuring that we can achieve the highest levels of capability with the *Collins* fleet across this long period will be essential.
- 4.18 This investment will build on recent improvements to *Collins* Class availability. In 2011–12, the *Collins* Class availability was about half that of the international benchmark and in the past there had been up to three submarines undergoing long-term maintenance. Following the 2012 Coles Review, and implementation of a comprehensive and innovative transformation plan, there has been a major improvement in the availability of the *Collins* Class, and Defence is on track to reach the international benchmark for submarine availability by mid-2016. By



mid-2016, the submarine HMAS *Farncomb* will have completed the first two-year full cycle docking in Adelaide – a maintenance activity that formerly took over three years to complete. From then onwards, only one *Collins* Class submarine will be in Adelaide for full cycle docking. Defence will continue to work closely with industry to implement reforms to optimise *Collins* Class availability, reliability and capability.

- 4.19 As an important part of the submarine capability, the existing contracted Submarine Escape Rescue and Abandonment System will be replaced in the early 2020s. The replacement system will be transportable by air and road and deployable on a range of vessels.
- 4.20 Facilities and infrastructure upgrades at Fleet Base West (HMAS Stirling) and Fleet Base East (Garden Island) are programmed and will include provision for the larger future submarine fleet.

### ***Destroyers and frigates***

- 4.21 Three *Hobart* Class Air Warfare Destroyers will enter service by the early 2020s and will remain in service into the 2040s. This project is behind schedule and over budget. It is critical that lessons are learned and adopted to ensure the Air Warfare Destroyer project is completed to demonstrate Defence and industry's ability to deliver a highly complex modern naval capability. The completion of the Air Warfare Destroyer project will also enable skilled resources to be redirected to other high-priority naval projects and free up scarce infrastructure to enable other projects to proceed in a timely and effective manner. These AEGIS combat system-equipped ships will provide maritime task groups with advanced air defence capabilities and will be equipped with a range of defensive systems, including the ability to counter submarines. To ensure that the destroyers keep pace with regional capabilities, we will:
    - ▶ regularly upgrade the AEGIS combat system
    - ▶ acquire advanced surface-to-air missiles
    - ▶ upgrade self-protection systems and unmanned tactical intelligence, surveillance, and reconnaissance systems.
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- 4.22 Enhancements will also be undertaken to the communications and combat system to support interoperability with other platforms and systems such as the E-7A Wedgetail, P-8A Poseidon, F-35A Lightning II and the future frigate.
- 4.23 Australia's existing fleet of eight *Anzac* Class frigates will be replaced from the late 2020s by a new fleet of nine frigates, which will be more capable than the *Anzac* Class. Following a competitive evaluation process, a continuous build of Australia's future frigates will begin in South Australia in 2020. The future frigates will be required to conduct a range of missions, with a particular focus on anti-submarine warfare. They will have sufficient range and endurance to operate effectively throughout maritime South East Asia. They will be able to be deployed from forward bases, such as in the Middle East, and will be equipped with a range of offensive and self-protection systems.
- 4.24 The *Hobart* Class ships and future frigates will operate embarked helicopters and tactical unmanned systems as integral components of their combat systems. The ships will have sufficient endurance for short-term regional operations; however, their effectiveness will be multiplied when supported by replenishment ships, intelligence, surveillance, and reconnaissance systems, and when operating in unison with maritime surveillance and response aircraft.
- 4.25 Australia's destroyers and frigates will operate in task groups and also in smaller task units or elements in coalition or independent ADF operations, commensurate with the scale and intensity of the missions at hand.
- 4.26 Since the *Anzacs* will remain as a key component of our surface fleet beyond the decade to FY 2025–26, it is essential to continue the upgrades of the fleet's sensors with the CEAFAF radar, as well as ensuring that the combat and weapons systems remain interoperable with other ADF and coalition assets. Defence has programmed upgrades to the destroyers' and *Anzac* Class frigates' combat systems, weapons,



sensors and countermeasures to mitigate obsolescence caused by emerging air and surface threats and maintain systems supportability.

- 4.27 Infrastructure works at HMAS Stirling and Garden Island will accommodate the necessary upgrades for the future frigate. HMAS Coonawarra, in the Northern Territory, will also be upgraded to support the existing maritime force. In the longer-term, potentially in the mid to late 2030s, options to establish naval facilities with greater capacity in the Northern Territory may be required. This will be the subject of further analysis.

***Maritime surveillance and response aircraft***

- 4.28 The existing AP-3C Orion aircraft are being replaced by the P-8A Poseidon aircraft to support maritime surveillance and response together with the MQ-4C Triton unmanned aircraft (discussed in the *intelligence, surveillance, reconnaissance, electronic warfare, space and cyber* stream).
- 4.29 While the primary role of the maritime surveillance and response aircraft is intelligence, surveillance, and reconnaissance in support of maritime operations, it can also undertake offensive operations against submarines and ships, and support search and rescue operations.
- 4.30 We will regularly upgrade the Poseidon to ensure that it remains common with the United States Navy's fleet, to maintain its capability against prevailing threats and to minimise support and development costs. Future planned upgrades to be considered include enhancements to the radar, targeting, communications and weapons. The aircraft will be upgraded incrementally throughout its life, including necessary sensor, combat management, weapons, stores and countermeasures systems, to mitigate obsolescence caused by emerging submarine, surface and air threats and to maintain systems supportability.
- 4.31 Eight Poseidon aircraft will be introduced in the early 2020s, with seven additional aircraft to be acquired in two tranches to bring the total to fifteen aircraft by the late 2020s. Airfield upgrades are planned to support Poseidon operations, including the Cocos (Keeling) Islands airfield.
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***Maritime tactical unmanned aircraft***

- 4.32 To improve the situational awareness of ships on operations, we will acquire a new tactical unmanned intelligence, surveillance, and reconnaissance aircraft system that will complement other sensors and systems by extending the area able to be held under surveillance. These systems will be progressively introduced over the decade to FY 2025-26. They will be able to operate from a range of vessels of varying size, including the future frigates and patrol vessels.

***Maritime combat helicopters***

- 4.33 The 24 MH-60R Seahawk helicopters are currently being accepted into service. These advanced helicopters will enhance the conduct of anti-ship and anti-submarine warfare operations undertaken by destroyers and frigates. The Integrated Investment Program includes provision for the Seahawk's combat system, sensors, weapons and countermeasures to be upgraded throughout their operational life to maintain commonality and supportability with the United States' Navy.

***Deployable anti-ship missiles***

- 4.34 Defence will acquire a new deployable land-based anti-ship missile system from the mid-2020s. This new capability to engage ships from land will enhance sea control and force protection for ADF deployments. It could also contribute to protecting vital offshore assets such as oil and natural gas platforms.

***Offshore patrol vessels***

- 4.35 Twelve offshore patrol vessels will replace the 13 existing *Armidale* Class patrol boats. Following a competitive evaluation process, construction will commence in Australia in 2018 as the first element of the continuous shipbuilding program, with all 12 offshore patrol vessels to be delivered by 2030.
- 4.36 The patrol vessels will enhance the ADF's capacity to support border security, maritime resource protection and military patrol and response



operations. These larger patrol vessels will be primarily focused on border security and resource protection. They will also be capable of more extended operations, with enhanced range and endurance to improve support to operations further afield, particularly across maritime South East Asia and the South Pacific.

- 4.37 The acquisition of a class of patrol vessels with greater capacity than the *Armidale* Class should enable the destroyer and frigate force to concentrate on higher tempo, higher risk tasks beyond Australia's coastal areas. These larger patrol vessels of around 70–80 metres in length will be able to embark unmanned aerial, underwater and surface vehicles and operate larger sea boats than the existing *Armidale* Class.

#### ***Mine countermeasures systems***

- 4.38 Defence will extend the life of four *Huon* Class Coastal Mine Hunters until the 2030s, through a Service Life Extension and Capability Assurance Program to be conducted between 2018 and 2025.
- 4.39 Extending the life of four of the existing *Huon* Class fleet will provide time to develop and evaluate remotely operated mine countermeasures and bathymetric collection systems to inform capability development. This could include the potential future option of a modular, mine countermeasures system that could be deployed from a range of non-specialist vessels, subject to developments in technology.

#### ***Hydrographic survey and maritime geospatial systems***

- 4.40 The current fleet of two large and four smaller ADF hydrographic survey vessels will be progressively retired from around the early 2020s. Defence will replace this capability with an efficient combination of military and commercial hydrographic and oceanographic survey capabilities to deliver the required capacity. Subject to developments in technology, modular systems could in the future enable enhanced hydrographic capabilities from non-specialist vessels suitable for tasks including rapid environmental assessment in support of operations.
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- 4.41 Subject to suitable commercial arrangements, the Laser Airborne Depth Sounder (currently hosted in a commercially contracted aircraft) could be replaced from around 2019. It could be replaced with a commensurate high volume space and/or air-based bathymetry collection system, and contracted ship-based, and remotely operated, underwater vehicle-based sensors.

Table 6: Summary of key investment decisions from FY 2016–17 to FY 2025–26

Program title	Program Timeframe	*Approximate investment value
<i>Hobart Class Air Warfare Destroyer (3 ships)</i>	Approved	\$9.1bn
P-8A Maritime Surveillance and Response Aircraft (8 aircraft) and facilities	Approved	\$4.8bn
MH-60R Naval Anti-Submarine Warfare Helicopter (24 helicopters)	Approved	\$1.9bn
Additional Maritime Surveillance and Response Aircraft (4 aircraft)	Scheduled for approval†	\$1bn–\$2bn
Maritime Communications Modernisation	Approved	\$410m
Sea Sparrow Missile Upgrade	Approved	\$330m
<i>Anzac Class Frigate Electronic Support System Improvement</i>	Approved	\$210m
Future Frigate Program – Evaluation	Scheduled for approval†	\$100m–\$200m
Collins Submarine – Sonar Replacement	Scheduled for approval†	\$100m–\$200m
Future Submarine Program – Evaluation	Scheduled for approval†	Less than \$100m
Offshore Patrol Vessel – Evaluation	Scheduled for approval†	Less than \$100m
Future Submarine Program – Design and Construction	2018–2057	> \$50bn
Future Frigate Program – Design and Construction	2017–2040	> \$30bn
Future Submarine Program – Weapons and Systems	2018–2045	\$5bn–\$6bn
Destroyer Program – Combat System	2017–2028	\$4bn–\$5bn
Maritime Anti-Ship Missiles and Deployable Land-based Capability	2018–2037	\$4bn–\$5bn
Offshore Patrol Vessel – Design and Construction	2016–2033	\$3bn–\$4bn
Maritime Area Air Defence Weapons Program	2025–2040	\$3bn–\$4bn
Future Frigate Program – Weapons	2020–2044	\$3bn–\$4bn



Program title	Program Timeframe	*Approximate investment value
Destroyer Program – Area Air Defence Weapons	2018–2028	\$2bn–\$3bn
Maritime Combat Helicopter Assurance Program	2018–2045	\$2bn–\$3bn
Future Frigate Program – Electronic Attack and Countermeasures Systems	2020–2029	\$2bn–\$3bn
Hydrographic Data Collection Capability	2016–2026	\$1bn–\$2bn
Mine Countermeasure Systems	2016–2035	\$1bn–\$2bn
Evolved Sea Sparrow Missile (ESSM) Program	2017–2037	\$1bn–\$2bn
Maritime Surveillance and Response Aircraft Program	2017–2027	\$1bn–\$2bn
Nulka Decoy Program	2017–2031	\$750m–\$1bn
Patrol Vessels Wharves and Port Facilities	2018–2026	\$750m–\$1bn
<i>Collins</i> – Satellite Communications	2019–2024	\$750m–\$1bn
Collins Submarine – Sonar Replacement	2017–2027	\$500m–\$750m
Maritime Communications Modernisation	2017–2028	\$500m–\$750m
Maritime Tactical Unmanned Aircraft	2018–2030	\$500m–\$750m
<i>Collins</i> Class Submarine Sensor and Communication Enhancements	2016–2025	\$400m–\$500m
Submarine Escape and Abandonment System	2016–2024	\$400m–\$500m
Anzac Air Search Radar Replacement	2016–2023	\$300m–\$400m
Naval Operations Facilities in the North	2016–2022	\$200m–\$300m
Cocos (Keeling) Islands Upgrade	2016–2021	\$100m–\$200m
Torpedo Self Defence	2016–2029	\$100m–\$200m

\*The figures in the table cover the acquisition element of the programs. There will be additional investment in whole-of-life sustainment and operating costs for each program. All figures are calculated on an out-turned price basis.

†Project scheduled for approval in FY 2015-16.

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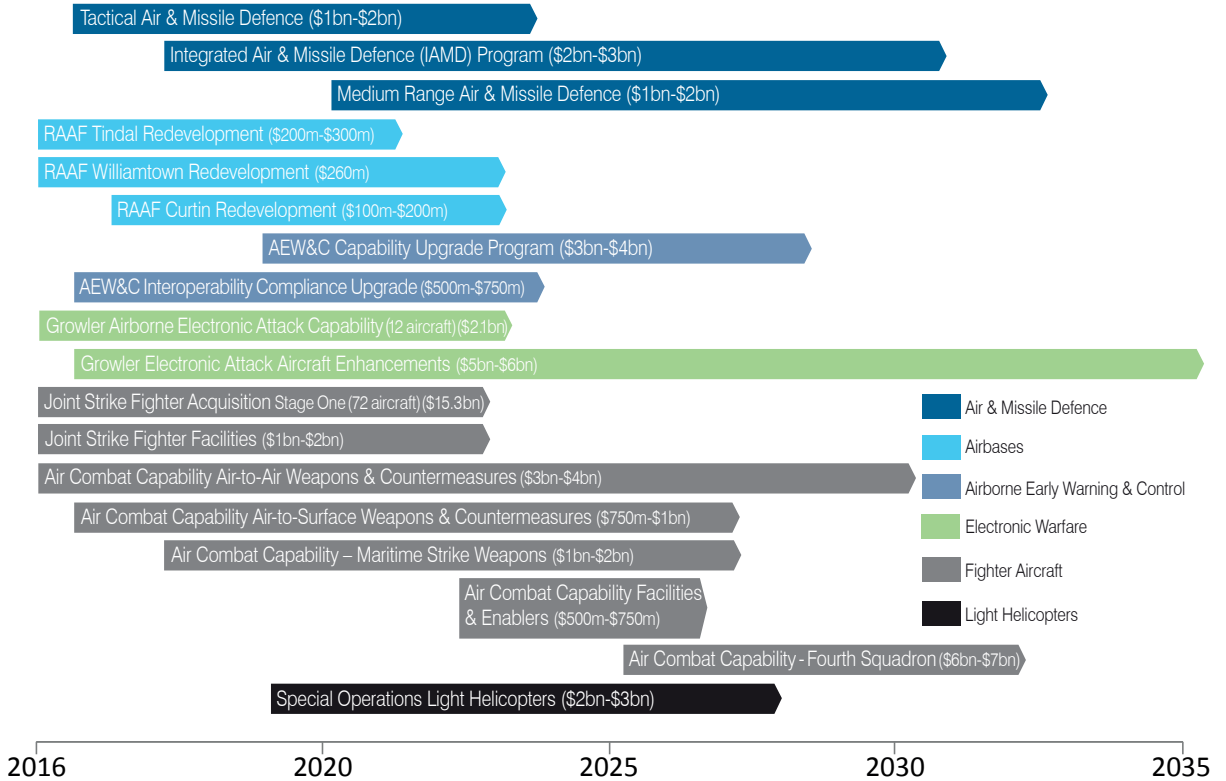
# POTENT AND AGILE OFFENSIVE RESPONSE

CAPABILITY STREAM: STRIKE AND AIR COMBAT



## Proposed Future Force (Strike & Air Combat)

Indicative Acquisition Windows of Key Approved & New Programs



## ► Potent and Agile Offensive Response

### Capability Stream: Strike and air combat

- 5.1 Over the decade to FY 2025–26, Defence will invest around 17 per cent of the Integrated Investment Program to enhance Australia's strike and air combat capabilities.
  - 5.2 A potent strike and air combat capability will enable effective airspace control (in the defence of Australia and its territories or when ADF elements are deployed on operations) and precision strike at long ranges. A robust set of current and planned platforms and systems provide the basis upon which to build the future capability, which could encompass theatre level integrated air and missile defence in support of deployed forces. Substantial investments are proposed to strengthen our platforms, command, control, communications, computing and intelligence (C4I) systems, sensors and advanced weapons.
  - 5.3 Australia's existing and already approved capabilities that contribute to the strike and air combat function are:
    - fighter and strike aircraft (24 F/A-18F Super Hornets and 72 F-35A Lightning II Joint Strike Fighters) and our current fleet of 71 F/A-18A/B 'classic' Hornets which is being progressively retired
    - electronic attack aircraft (12 E/A-18G Growlers)
    - early warning and control aircraft (6 E-7A Wedgetails)
    - air-defence systems.
  - 5.4 The capabilities will be enhanced through:
    - new air-to-surface, air-to-air and high-speed and long-range strike and anti-ship weapons
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- ▶ upgrades for the Growler aircraft
- ▶ future replacement of the Super Hornets
- ▶ better integration of air and space surveillance systems, including upgrades to command and control capabilities
- ▶ enhanced fixed and deployable air search radars
- ▶ deployable ground-based air-defence systems
- ▶ light helicopters that are rapidly deployable by transport aircraft.

5.5 The Government will increase investment to improve communications, sensors and targeting system integration between various platforms, including the Joint Strike Fighters, Wedgetail, *Hobart Class* Air Warfare Destroyers, Growlers and land-based systems – so that their capabilities can be combined more effectively during joint operations, generating greater potency and lethality. Realising the full potential of the Joint Strike Fighter and Growler aircraft is dependent on investments outlined in the Intelligence, surveillance, reconnaissance, electronic warfare, space and cyber stream. These investments will facilitate enhancements in processing, analysing and disseminating intelligence and mission data.

#### ***Strike and air combat workforce summary***

- 5.6 The strike and air combat workforce will increase by around 500 ADF positions to support:
- ▶ advanced C4I to underpin more robust integration of air and missile defence systems
  - ▶ deployable light helicopters
  - ▶ deployable ground-launched air-defence capabilities.

#### ***Strike and air combat infrastructure summary***

- 5.7 Significant investment is planned this decade to FY 2025–26 in new infrastructure and facilities that support the ADF's strike and air combat capabilities. Key proposals include upgrading facilities at:
- ▶ RAAF Tindal, Northern Territory
  - ▶ RAAF Williamtown, New South Wales



- ▶ RAAF Scherger, Queensland
- ▶ RAAF Bases Learmonth and Curtin, Western Australia.

5.8 Most of these proposals are representative of broader works to strengthen ADF presence and provide operational supportability in and from the north of Australia, and to accommodate the heavier and more sophisticated aircraft that will operate from these locations.

***Fighter and strike aircraft***

- 5.9 The Super Hornet and the Joint Strike Fighter will conduct both strike and air-defence roles. The 72 Joint Strike Fighters will begin to enter operational service to replace Australia's 'classic' Hornets from 2020 and are expected to be the pre-eminent regional air combat capability for at least 20 years following their introduction into service. The Joint Strike Fighter will have advanced fifth-generation systems and situational awareness. They will be able to employ a mix of air-to-air and air-to-surface weapons with precision, be able to operate at extended ranges maintaining stealth, and provide a true multi-role capability.
- 5.10 The Joint Strike Fighter will be interoperable with other ADF elements equipped with United States derived systems as well as United States forces. The nature of the global partnership in developing and supporting the Joint Strike Fighter also extends an interoperability benefit more broadly with potential coalition partners, including within our region. Regular updates to maintain a common and supportable configuration with the United States' Joint Strike Fighter fleet will reduce the cost to Australia of upgrading the software and hardware to maintain its leading edge capabilities.
- 5.11 The Super Hornet fleet has been extended beyond its initial bridging capability timeframe and is now planned to be replaced by around 2030. Its replacement could include either a fourth operational squadron of Joint Strike Fighters or possibly a yet to be developed unmanned combat aerial vehicle. The decision on the replacement of this air combat capability will be best undertaken post-2020 when technology
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and emerging threat trends are better understood, and we have the benefit of our initial Joint Strike Fighter operating experience.

- 5.12 A series of new weapons will be acquired for the strike and air combat capability including air-to-surface and air-to-air munitions, with specific consideration of high-speed and long-range strike and anti-ship weapons.
- 5.13 To support the continual transformation of the ADF's strike and air combat fleet and its enabling capabilities, an extensive program of investment in infrastructure will be required across Australia. New and enhanced weapons and explosive ordnance facilities at RAAF Amberley, Williamtown, Townsville, Tindal and Defence Establishment Orchard Hills will allow these new high technology weapon systems to be stored and maintained safely and securely. A northern explosive ordnance storage facility will also be established at or near RAAF Tindal for the bulk storage of explosive ordnance. A new rail link from the main line will be established to Tindal to allow for the transport of bulk fuel and ordnance.
- 5.14 The existing infrastructure at RAAF Williamtown and RAAF Amberley will be upgraded. Dedicated infrastructure works to support the Joint Strike Fighters will proceed at RAAF Bases Williamtown, Edinburgh, Townsville, Tindal, Darwin, Curtin, Learmonth, Pearce and Scherger. Air traffic control systems will be upgraded across the country in concert with upgrades to civil aviation systems. Infrastructure and other systems will also be built or acquired to support refuelling and fire control.
- 5.15 There will be a substantial focus on infrastructure-related investments in northern Australia, in particular the Northern Territory. As Defence's plans mature, it will be essential that there is close and effective engagement with key stakeholders, such as the Northern Territory government. In the longer-term, post-2026, and subject to further analysis of options, consideration will need to be given to developing options to enhance air base capacity in the Northern Territory, to address growing capacity, security and urban encroachment issues. A new facility to support the ADF of the twenty-first century will better support operations, training and exercises.



- 5.16 A new advanced joint training area and enhanced training target systems will also be considered for northern Australia. This facility will support joint exercises between the ADF and Australia's allies and security partners, particularly where advanced air support is required.

***Airborne electronic attack aircraft***

- 5.17 The 12 E/A-18G Growler electronic attack aircraft represent a new capability that will enter service from 2018, and is likely to remain in service for 20–30 years. These aircraft use a combination of electronic systems and sophisticated weapons to disrupt, disable and/or confuse adversaries' systems such as radars and command, control, communications, computers and intelligence systems. They typically work with fighter and strike aircraft to produce a potent air combat package, but are also particularly useful in supporting a range of other missions. These aircraft will be kept common with the United States' fleet through regular upgrades.
- 5.18 New weapons and other systems will be acquired to enable the ADF to fully utilise this capability. The high level of commonality between the Growler and Super Hornet fleets provides an opportunity for common training.
- 5.19 New dedicated facilities will be built at RAAF Amberley to house and support the Growler capability. This capability will also be supported by facilities upgrades and base improvement works including RAAF Tindal, the Woomera range complex and the Delamere Air Weapons Range.

***Airborne early warning and control aircraft***

- 5.20 The airborne early warning and control capability consists of six in-service Wedgetail aircraft. Its highly capable and long-range radar and other sensors allow the Wedgetail to maintain a broad picture of the battlespace, which is used to coordinate joint operations.
- 5.21 The Wedgetail will continue to be upgraded in order to maintain its capability edge ahead of a major refresh or replacement in the
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mid-2030s. Software, hardware and communications elements will also be upgraded to enhance interoperability with other ADF and coalition assets. The Wedgetail will play a key role in the ADF's integrated air and missile defence capability, particularly for deployed operations.

- 5.22 This capability will be supported by planned upgrades to airfield and support facilities at RAAF Tindal.

***Integrated air and missile defence***

- 5.23 The ADF's existing air-defence systems will be upgraded, including command, control, communications, computers and intelligence (C4I) systems and sensors. Investment in C4I will provide the foundation for an enhanced integrated air and missile defence system for the ADF, ensuring key C4I systems are able to fuse and share air and space surveillance information effectively to enhance the accuracy and speed of ADF systems' response to air and missile threats. The ADF's enhanced integrated air and missile defence C4I architecture will have the flexibility for further enhancement to handle more complex threats that may emerge in future.
- 5.24 Defence will also acquire ground-based active electronically scanned array radars from around 2020 and expand Australia's access to air and space situational awareness information, including through space-based systems (discussed in the *Intelligence, surveillance, reconnaissance, electronic warfare, space and cyber* stream).
- 5.25 In enhancing the ADF's integrated air and missile defence capability, Defence will also develop a Joint Battle Management System to better coordinate and synchronise ADF operations, including the tracking and engagement of forces within an area of operations. This system will be deployable, in addition to supporting Australian-based capabilities. It will improve situational awareness, such as the ability to generate and disseminate a common operating picture, and enhance coordination of air battle management, joint weapons employment (including maritime and land strike) and ground-based air defence in operational theatres.



- 5.26 As part of the enhanced integrated air and missile defence system, the Regional Operations Centres at RAAF Williamtown and Tindal, and the Vigilaire air surveillance system, will be upgraded or replaced to enable integration with a broad range of systems and sensors. In addition, ADF capabilities will also be upgraded, where necessary, with modern Identification Friend or Foe systems to allow unambiguous identification and reduce the chance of fratricide in joint and coalition operations.
- 5.27 The ADF's current ground-based air-defence capability consists of the short-range RBS-70 air-defence system, which has limited utility against modern threats. The future ground-based air-defence system will replace the RBS-70 with a short-range man-portable surface-to-air system by the early 2020s, and will later be supplemented by a medium-range surface-to-air missile system in the mid to late 2020s, providing a layered air-defence against a broad range of capable air threats. These systems will be matched with command and control and fire control systems with high levels of integration to act as the inner layers of the upgraded integrated air and missile defence system.
- 5.28 In the near term, an advanced tactical 'sense, warn, locate and effect' system with improved sense and warn capabilities compared to the current Counter-Rocket, Artillery and Mortar system for rocket, artillery, mortars and bombs, will also be acquired. This system would be enhanced in the future with a gun system capable of engaging a range of threats as the last line of defence against rocket and missile attacks; this will provide improved force protection for static ground elements, and act as the inner-most layer of the enhanced integrated air and missile defence system.

#### ***Deployable light helicopters***

- 5.29 In addition to the CH-47F Chinook and MRH-90 Troop lift helicopters (which are used primarily for air lift), a new fleet of light reconnaissance and attack helicopters will be acquired from around 2025 to provide
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air mobility support optimised for special operations missions. The new helicopters will likely feature some light armament and modern intelligence, surveillance, reconnaissance and communications capabilities for integration with the joint force. They will be able to be deployed rapidly as a small force element of three to four aircraft and personnel by the Globemaster. Current plans also include a requirement for role-specific upgrades to the MRH-90 Troop lift helicopter to replace the S-70A Blackhawk in support of domestic counter-terrorism operations.

Table 7: Summary of key investment decisions from FY 2016–17 to FY 2025–26

Program title	Program Timeframe	*Approximate investment value
F-35A Joint Strike Fighter (JSF) Acquisition Stage One (72 aircraft)	Approved	\$15.3bn
E/A-18G Growler Airborne Electronic Attack Capability (12 aircraft)	Approved	\$2.1bn
F-35A Joint Strike Fighter (JSF) Facilities – Tindal and Townsville	Approved	\$1.4bn
Air Combat Capability – Air-to-Air Weapons and Countermeasures	Scheduled for approval†	\$1bn–\$2bn
RAAF Tindal Redevelopment	Scheduled for approval†	Less than \$100m
RAAF Williamstown Redevelopment	Approved	Less than \$260m
Air Combat Capability – Fourth Squadron	2025–2031	\$6bn–\$7bn
Growler Electronic Attack Enhancements	2016–2035	\$5bn–\$6bn
Airborne Early Warning and Control (AEW&C) Capability Upgrade Program	2019–2025	\$3bn–\$4bn
Integrated Air and Missile Defence (IAMD) Program	2018–2030	\$2bn–\$3bn
Deployable Light Helicopters	2019–2028	\$2bn–\$3bn
Tactical Air and Missile Defence	2016–2024	\$1bn–\$2bn
Air Combat Capability – Maritime Strike Weapons	2018–2027	\$1bn–\$2bn
Medium Range Air and Missile Defence	2020–2032	\$1bn–\$2bn
Air Combat Capability – Air-to-Air Weapons and Countermeasures (Next Generation)	2024–2030	\$1bn–\$2bn
Air Combat Capability – Air-to-Surface Weapons and Countermeasures	2016–2027	\$750m–\$1bn
Airborne Early Warning and Control (AEW&C) Interoperability Compliance Upgrade	2016–2022	\$500m–\$750m



Program title	Program Timeframe	*Approximate investment value
Air Combat Capability Facilities and Enablers	2022–2026	\$500m–\$750m
RAAF Tindal Redevelopment	2016–2021	\$200m–\$300m
RAAF Curtin Redevelopment	2017–2022	\$100m–\$200m

\*The figures in the table cover the acquisition element of the programs. There will be additional investment in whole-of-life sustainment and operating costs for each program. All figures are calculated on an out-turned price basis.

†Project scheduled for approval in FY 2015–16.



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# POTENT AND AGILE OFFENSIVE RESPONSE

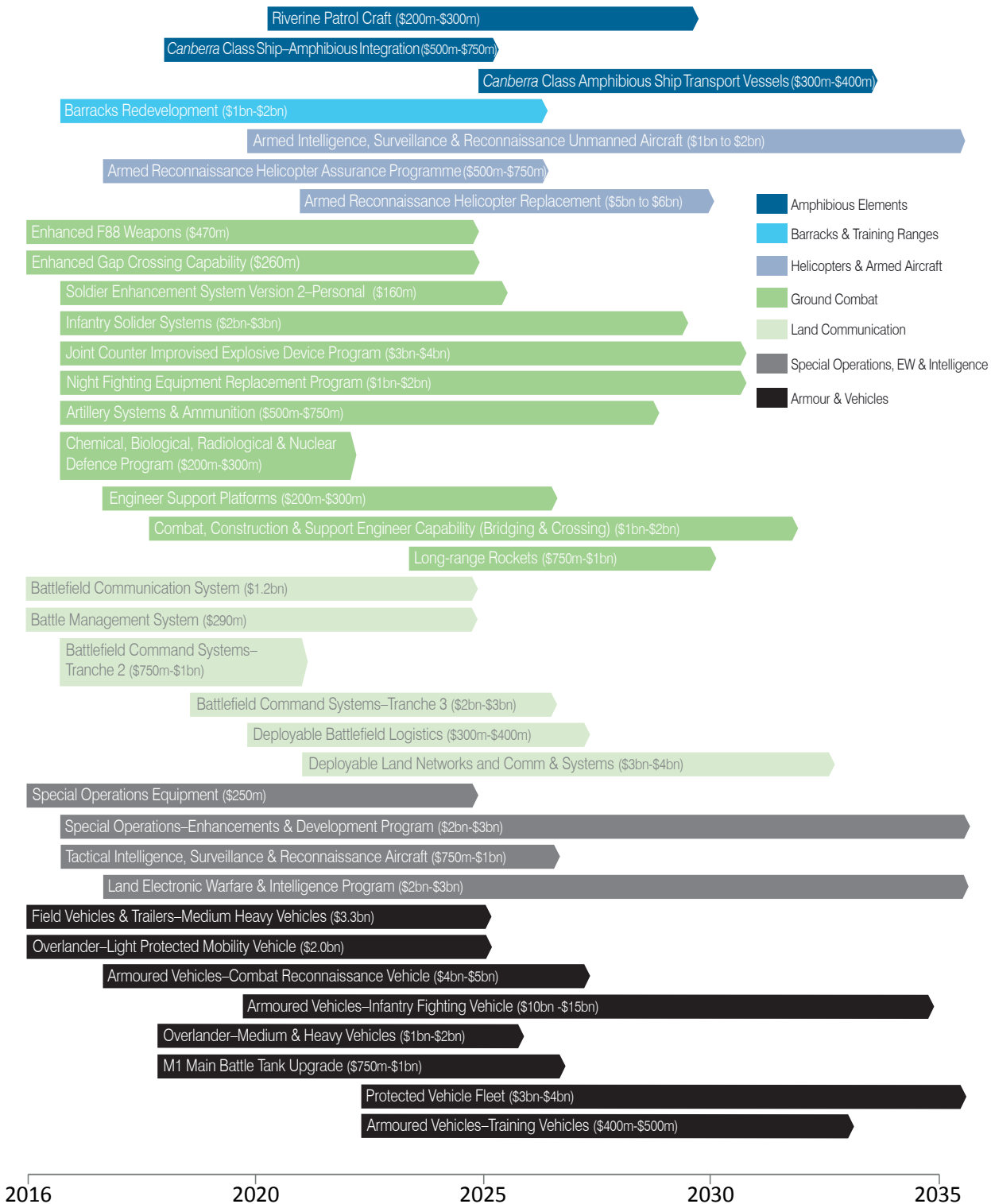
CAPABILITY STREAM: LAND COMBAT AND  
AMPHIBIOUS WARFARE



# Proposed Future Force (Land Combat & Amphibious Warfare)

Indicative Acquisition Windows of Key Approved & New Programs

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## ► Potent and Agile Offensive Response

### Capability Stream: Land combat and amphibious warfare

- 6.1 Over the decade to FY 2025–26, Defence will invest around 18 per cent of the Integrated Investment Program in Australia’s land combat and amphibious warfare capabilities.
  - 6.2 The land force has seen major investment in core capabilities over more than a decade of high tempo operations. Enhancements will be made across a range of capabilities including compatible digital communications and information systems to enable the land force to integrate with other parts of the ADF and coalition forces. The *Canberra* Class amphibious ships will significantly enhance the ADF’s ability to undertake a broad range of operations throughout our near region.
  - 6.3 Land capability is fundamentally organised around combat and enabling brigades that are combined to achieve desired effects.
  - 6.4 The combat elements of Infantry, Armour, Artillery, Engineers, Aviation and Special Forces all contribute to the land combat and amphibious warfare function. These forces are supported by intelligence, surveillance, reconnaissance and electronic warfare capabilities, deployable battlefield logistics and the *Canberra* Class amphibious ships and associated amphibious support capabilities.
  - 6.5 Existing capabilities and approved acquisitions include:
    - advanced personal equipment for soldiers
    - protected mobility (such as Bushmasters and the Hawkei)
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- ▶ enhanced force protection (such as capabilities to counter improvised explosive devices)
- ▶ new artillery
- ▶ enhanced digital communications.

6.6 New investments will enhance land combat and amphibious warfare capabilities through improved situational awareness, firepower, protection, mobility and force sustainability. These investments will include:

- ▶ a program for continuously improving soldiers' personal equipment and force protection
- ▶ expanding digital communications and networks with enhanced joint integration
- ▶ acquiring a new generation of armoured vehicles
- ▶ upgrading the existing M1 Abrams Main Battle Tank fleet
- ▶ enhancing battlefield intelligence, surveillance and reconnaissance capabilities through a new armed, medium-altitude long-endurance unmanned aircraft and a suite of tactical unmanned systems
- ▶ replacing the Tiger helicopter fleet with a future armed aerial reconnaissance capability from the mid-2020s
- ▶ acquiring combat and amphibious support systems including over-the-beach logistics and beached materiel recovery
- ▶ acquiring additional small boats and other specialist capabilities such as breaching, bridging and recovery equipment
- ▶ acquiring a new long-range rocket system in the mid-2020s.

#### ***Land combat and amphibious warfare workforce summary***

6.7 A range of enhancements will be made in the land combat and amphibious warfare function. Around an additional 700 ADF positions



will be required to support enhancements to:

- ▶ force generation for amphibious operations from the *Canberra* Class amphibious ships
- ▶ amphibious support systems, including over the beach logistics and beached materiel recovery
- ▶ armed medium-altitude, long-endurance unmanned aircraft
- ▶ tactical unmanned aircraft
- ▶ a long-range rocket capability
- ▶ combat support systems.

***Land combat and amphibious warfare infrastructure summary***

6.8 New investment this decade to FY 2025–26 is planned for infrastructure and facilities that support the ADF's land combat and amphibious warfare capabilities. Substantial funding is programmed for upgrading or extending soldiers' accommodation and facilities that will be required to support new and upgraded land combat and amphibious warfare capital equipment, such as new armoured vehicles, a new long-range rocket capability and a new armed, medium-altitude long-endurance unmanned aircraft.

6.9 A number of ADF training areas, along with a range of ADF establishments, will be upgraded. These include:

- ▶ Shoalwater Bay, Queensland – the major ADF joint amphibious training area
  - ▶ Bradshaw Field Training Area, Northern Territory
  - ▶ Cultana, South Australia
  - ▶ Yampi Sound, Western Australia
  - ▶ Puckapunyal Military Area, Victoria
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- ▶ Holsworthy Barracks, New South Wales
- ▶ Campbell Barracks, Western Australia
- ▶ Lavarack Barracks, Queensland
- ▶ Robertson and Larrakeyah Barracks, Northern Territory.

6.10 Key enhancements will include the construction of advanced training target systems and connection to the enterprise simulation system. Together these enhancements will improve the realism and effectiveness of integrated, joint force training.

### ***Infantry – soldier systems***

6.11 The soldier system refers to items worn by individual soldiers and the equipment they carry to prevail in combat. The ability to rapidly acquire, upgrade or adapt critical soldier system capabilities is important to ensure that soldiers can operate in different environments and address new threats or tactical requirements. As we have seen over the last decade, evolving operational requirements can often be met quickly through rapid acquisition programs. Defence will continuously monitor, adapt and improve the ensemble of soldier system and force protection equipment in response to evolving operational requirements, taking into account new technologies and emerging threats such as developments in body armour or improvised explosive devices. This will ensure our ADF personnel are appropriately equipped for the particular mission and operational environment at hand, including as we further develop the ADF's amphibious capability.

6.12 The key weapons systems to be acquired include:

- ▶ small arms – such as rifles and pistols
- ▶ direct fire support weapons including those used against armoured vehicles, bunkers and installations
- ▶ indirect weapons – such as mortars.



- 6.13 New improved personal protection equipment will also be acquired. Investment funding will support the agile procurement of personnel equipment including:
- ▶ a flexible suite of combat uniforms to suit camouflage and climatic conditions
  - ▶ body armour
  - ▶ helmets
  - ▶ night-fighting equipment
  - ▶ load carriage systems
  - ▶ personal protective equipment to mitigate chemical, biological and radiological threats.
- 6.14 A range of command, control and situational awareness systems will be acquired to ensure information access is available to individual soldiers and commanders to support decision-making. These systems will provide location reporting and secure voice communications.

### ***Armoured vehicles***

- 6.15 There are four elements to the armoured vehicle capability:
- ▶ armour – based on the Abrams
  - ▶ cavalry – based on the current ASLAV and the future replacement Combat Reconnaissance Vehicle
  - ▶ armoured mobility – based on the current M113AS4 Armoured Personnel Carrier and a future replacement Infantry Fighting Vehicle
  - ▶ armoured Combat Support and Combat Service Support (specialist versions of the above mentioned platforms).
- 6.16 The current Abrams fleet will be upgraded to extend its life to at least 2035. Upgrades will maintain the tanks' effectiveness and lethality against evolving threats as well as enhancing their interoperability with
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other ADF platforms and systems. The ASLAV fleet will be replaced with new Combat Reconnaissance Vehicles from around 2019 to provide an enhanced persistent close reconnaissance capability. The Armoured Personnel Carrier fleet will be replaced with new Infantry Fighting Vehicles from around 2024. These vehicles will be equipped with superior firepower, networking and protection and will be deployable rapidly by air in small numbers and in larger numbers by *Canberra* Class amphibious ships and logistics support vessels.

- 6.17 Upgraded or additional facilities will be required at existing bases (including in Brisbane, Darwin, Puckapunyal and Townsville) and at selected weapon ranges and training areas (including Puckapunyal and Shoalwater Bay).

***Canberra class amphibious ships***

- 6.18 The two *Canberra* Class amphibious ships will provide the ADF with an unprecedented capability to conduct a wide range of operations (both war and non war-like) in the maritime environment. These two ships will enable the ADF to land a sizeable force of personnel and equipment across a broad spectrum of operations. In non-combat operations, the amphibious ships' on-board hospital and their ability to operate without wharves or port infrastructure will be a major asset in support of both domestic and international disaster recovery missions.
- 6.19 Over time the capability of the ships will be enhanced to better support joint command and control, including upgrades to communications and intelligence systems and semi-autonomous self-defence capabilities. This will include communications systems that are compatible with all amphibious force elements – watercraft, helicopters and amphibious vehicles – allowing enhanced command and control and situational awareness. The ships will also be fitted with systems that allow them to collect, analyse and distribute intelligence. In the longer-term, the existing landing craft used to transport people and equipment from the *Canberra* Class ships to the shore will be replaced with new vessels.



- 6.20 Infrastructure works at HMAS Stirling and Garden Island will be undertaken to support the *Canberra* Class amphibious ships.

***Special operations forces***

- 6.21 The special operations capability provides rapidly deployable options to respond to high-risk threats in unpredictable and uncertain environments. Special operations can be broadly grouped into the categories of special reconnaissance, special recovery and direct action.
- 6.22 The Integrated Investment Program will enhance Australia's special operations capabilities, including through: acquiring high-end close combat capabilities; improved mission command networks and situational awareness tools; enhanced tactical mobility; specialised force protection; and logistic support capabilities. Specialist transportation systems will also be acquired, upgraded or factored into other planned capability acquisitions, including land vehicles, role-specific upgrades to existing helicopters and the new light deployable helicopter from the mid-2020s, watercraft and parachuting capability. Special operations forces will also benefit from the enduring program of soldier system continuous development outlined above, supported by the continuous development and procurement of equipment where there is a more specialised requirement.

***Artillery***

- 6.23 Artillery provides a persistent fire support capability in support of ADF or coalition land operations. The current artillery capability consists of 54 medium artillery howitzers (155mm M-777 towed artillery), with supporting equipment and personnel. The M-777 capability can engage targets out to 30km with persistent and responsive fires in all weather.
- 6.24 A long-range rocket system will be acquired in the mid-2020s to complement the ADF's existing artillery capability, providing an option for long-range fire support (up to around 300km) to joint operations. Enhanced C4I and high levels of airspace and target coordination will support the introduction of this substantial new capability for the ADF.
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- 6.25 Some additional facilities may be required to support the long-range rocket capability. These will include gun bays, workshops and simulators at a yet to be chosen garrison location as well as compatible training areas and target systems.

***General purpose and protected vehicles***

- 6.26 The ADF's ground transport capabilities provide protected and unprotected mobility for a range of joint combat and support systems. The general purpose 'B' vehicle fleet comprises light, medium and heavy vehicles and trailers. A program to replace these vehicles is expected to be completed by the mid-2020s – this program will include the introduction of protected variants to the fleet to enhance force protection.
- 6.27 Australia's Protected Mobility Vehicles provide superior protection for our forces against blast and fragmentation. Our Protected Mobility fleet comprises the Australian designed and produced Bushmaster and Hawkei vehicle fleets. The Bushmaster fleet (approximately 700 vehicles) will be replaced after reaching its life of type from around 2025. The new Hawkei light Protected Mobility Vehicles will be introduced from the early 2020s. Defence will ensure the compatibility of the Protected Mobility fleet and general purpose 'B' vehicles with the ADF's amphibious ships, organic watercraft and transport aircraft for off-shore deployment.

***Combat, construction and support engineers***

- 6.28 Engineering support for land force operations consists of combat, construction and support engineers. These elements provide support to all land forces through five core functions:
- ▶ assault breaching of obstacles, bridging and route construction
  - ▶ counter-mobility – construction of obstacles and demolition of bridges and routes
  - ▶ survivability – physical hardening and fortification of installations



- ▶ sustainability – provision of water, sanitation and electricity to deployed forces
  - ▶ geospatial support – reconnaissance and analysis of terrain.
- 6.29 Key capabilities to be acquired over the decade to FY 2025–26, which will include consideration of cost effective commercial leasing arrangements where appropriate, include protected and unprotected engineering work platforms such as cranes, excavators, front-end-loaders, forklifts, tractors, concrete production plants and rock crushers. Armoured breaching and bridging platforms, aviation and fire trucks and other support capabilities will also be acquired.

***Armed reconnaissance helicopter***

- 6.30 The 22 Tiger helicopters provide a responsive reconnaissance and attack platform to support joint operations. In a reconnaissance role this helicopter complements other surveillance and reconnaissance capabilities. The Tiger’s intelligence, surveillance, reconnaissance and electronic warfare capabilities and attack options (including a range of precision weapons) can be employed and tailored to support tasks including close air support, escort and interdiction.
- 6.31 Armed reconnaissance helicopter operations will rely increasingly on intelligence and mission data and access to the common operating picture and other real time data for effective integration with joint forces.
- 6.32 The Tiger has had a troubled history – essential upgrades are programmed to maintain the capability’s effectiveness. Defence will invest in a future armed reconnaissance capability to replace the Tiger, which could include manned or unmanned systems or a combination of both, to be introduced from the mid-2020s.

***Armed intelligence, surveillance, reconnaissance unmanned aircraft***

- 6.33 The ADF does not currently operate armed unmanned aircraft systems. Defence developed an operational unmanned aircraft capability in the Afghanistan conflict to provide persistent observation of the battlefield

through a number of sensor types. Provision to grow the ADF's existing capability through acquisition of an advanced armed, medium-altitude, long-endurance unmanned aircraft for an integrated and persistent intelligence, surveillance, reconnaissance and attack capability to support ADF and coalition forces is programmed for the early 2020s.

- 6.34 A fully integrated armed, medium-altitude unmanned aircraft capability supported by intelligence analysts will facilitate the timely delivery of accurate information to commanders at all levels, providing superior situational awareness to inform decision-making. This system's intelligence, surveillance and reconnaissance capability will also enhance the ADF's counter-terrorism support capability overseas and could augment search and rescue, humanitarian assistance and disaster relief and coastal surveillance tasks.
- 6.35 The new armed, medium-altitude, long-endurance unmanned aircraft will require some enhancements to our command and control capabilities, along with facilities, including a ground control station and fixed and deployable launch and recovery elements. Some additional fixed facilities, including at RAAF Townsville, will be required to support this new capability.

***Land tactical intelligence, surveillance, and reconnaissance***

- 6.36 The land tactical intelligence, surveillance, and reconnaissance capability contributes to the protection of the force and directly supports the quality and timeliness of decision-making by improving a land commander's situational awareness. Land tactical intelligence, surveillance, and reconnaissance can be provided from many sources ranging from a soldier's observation to the systems on-board platforms on helicopters and vehicles. The key to the effective development of this capability is to ensure that information gathered is accessible and fused with other sources of data to build a common, integrated picture of the operating environment; in time, this integrated picture needs to be disseminated in a timely manner and be accessible as required across different force elements.



- 6.37 The systems that contribute to land tactical intelligence, surveillance, and reconnaissance in this context are ground-based sensors, small unmanned aircraft and joint integration to enable access to situational awareness. Ground-based sensing systems include laser range finders, weapons sights, thermal imaging and ground surveillance radar and some specialised surveillance systems employed with combat reconnaissance platforms. In addition to the in-service Shadow unmanned aircraft, new capabilities such as smaller hand-launched systems will be introduced to complement ground-based sensing and provide tactical commanders with organic, responsive systems.
- 6.38 Some additional facilities or enhancements may be required across existing bases to support new capabilities, including armouries and upgrades to weapon ranges and simulators.

#### ***Land intelligence and electronic warfare***

- 6.39 The land intelligence and electronic warfare capability directly supports land warfare and force protection through managing the collection, processing and analysis of information and the dissemination of intelligence to improve the quality and timeliness of a commander's decisions. This capability will be enhanced by new information management systems and networks that are able to support joint integration and strategic reach-back.

#### ***Deployable land networks***

- 6.40 Deployable land networks enable the land force to communicate across the battlespace including within and between formations on the ground, with aircraft and ships, with headquarters and other agencies or partners. The capability includes deployed and mobile network components. Deployed elements are moved into the area of operations where they are largely static until deployed elsewhere, while mobile elements are able to continue operating while moving around the battlespace.
- 6.41 Existing deployable systems include satellite systems, terrestrial communications systems (such as high frequency radio networks), and a deployed local area network which includes the ability to conduct
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information processing. The existing mobile network is typically built around portable devices operating independently of fixed infrastructure. Mobile devices range in size from computers and radios fitted in vehicles to mobile tactical radios carried by individual soldiers.

- 6.42 Technology moves at a rapid pace in the field of modern communications; the next generation of equipment is often available at 12-18 months intervals. The short obsolescence cycle of communications equipment presents both challenges and opportunities. It is essential that Defence has the agility to take advantage of rapidly advancing technology. This will require regular flexible investment approaches and effective industry partnerships as Defence pursues more agile strategies to keep pace with advancing needs and technology. A further challenge will be to ensure that, where practicable and effective, we maintain compatibility between the land, air and maritime components and ensure cost-effective maintenance programs. This will be achieved through establishing a program to progressively and regularly upgrade or replace the deployable land networks from around 2020.
- 6.43 Future challenges in developing the ADF's amphibious capability and integrating communications systems more broadly across the force will need to be addressed, including through building on the existing Land Network Integration Centre. This will provide an enhanced battle lab testing facility that will help to ensure systems interoperability across the joint force and explore more sensitive joint capability solutions for further development.

#### ***Battlefield logistics support***

- 6.44 The battlefield logistic support capability directly supports deployed forces and land operations through the supply, transport and maintenance of goods. Battlefield logistic support is a complex and critical function – it relies on and interacts with other logistics systems including national supply chains, commercial fuel arrangements and, potentially, coalition systems. A priority for investment is in enhancing our logistics over-the-shore capabilities, including for the transfer of



bulk fuels, water and stores, to support the evolving ADF deployable amphibious capability employing the *Canberra* Class ships.

- 6.45 The acquisition and upgrade of logistics systems, along with the reform of logistics business functions and processes, are central to the modernisation program to deliver an integrated Defence logistics system. Effective deployable systems, for instance on the *Canberra* Class amphibious ships, that can integrate with the national logistics systems to enable more efficient and timely logistics support will be a priority. These initiatives in logistics will ensure that the joint force is supported across the full spectrum of missions.
- 6.46 The battlefield logistic support capability includes the following functions:
- ▶ supply and distribution – the introduction into theatre and movement of stores such as ammunition, rations and fuel
  - ▶ transport – vehicles such as trucks, water transport, and handling equipment like forklifts
  - ▶ maintenance and recovery – maintenance of equipment and recovery of damaged equipment
  - ▶ field and support services – such as field power generation, water production, fuel storage and sanitation.
- 6.47 Progressive investment across the battlefield logistic support capability is required to maintain its effectiveness. This will include enhancements to the deployable logistics information systems, replacement of the current transport vessels (LCM8, LARC V), and replacement of the deployable materiel handling equipment. Deployable infrastructure will be upgraded, including field power generation and water purification systems. Defence will also continue to invest in ancillary capabilities including watercraft and amphibious deployment and sustainment systems to keep the logistics capabilities of the *Canberra* Class amphibious ships at the leading edge.
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### ***Riverine patrol***

- 6.48 A Riverine Patrol capability will be re-established to increase tactical mobility in the littoral zone. The Riverine Patrol capability will deliver a fleet of lightly armed boats from around 2022 to allow operations in a wide range of estuarine environments. The capability will provide sufficient capacity to embark a force element that is capable of effective combat and could be used to transport small mobility assets such as all-terrain vehicles.

Table 8: Summary of key investment decisions from FY 2016–17 to FY 2025–26

Program title	Program Timeframe	*Approximate investment value
Field Vehicles and Trailers – Medium Heavy Vehicles	Approved	\$3.3bn
Overlander – Light Protected Mobility Vehicle	Approved	\$2.0bn
Battlefield Communication System	Approved	\$1.2bn
Enhanced F88 Weapons	Approved	\$470m
Battle Management System	Approved	\$290m
Enhanced Gap Crossing Capability	Approved	\$260m
Special Operations Equipment	Approved	\$250m
Lightweight Howitzers	Approved	\$190m
Soldier Enhancement System – Version 2 – Personal	Approved	\$160m
Armoured Vehicles – Infantry Fighting Vehicle	2019–2032	\$10bn–\$15bn
Armed Reconnaissance Helicopter Replacement	2021–2030	\$5bn–\$6bn
Armoured Vehicles – Combat Reconnaissance Vehicle	2017–2027	\$4bn–\$5bn
Deployable Land Networks and Command Systems	2021–2032	\$3bn–\$4bn
Protected Vehicle Fleet	2023–2038	\$3bn–\$4bn
Joint Counter Improvised Explosive Device Program	2016–2031	\$3bn–\$4bn
Infantry Solider Systems	2016–2029	\$2bn–\$3bn
Special Operations – Enhancements and Development Program	2016–2038	\$2bn–\$3bn
Land Electronic Warfare and Intelligence Program	2017–2058	\$2bn–\$3bn
Battlefield Command Systems – Tranche 3	2019–2027	\$2bn–\$3bn
Armed Intelligence, Surveillance and Reconnaissance Unmanned Aircraft	2018–2038	\$1bn–\$2bn
Night Fighting Equipment Replacement Program	2016–2031	\$1bn–\$2bn
Combat, Construction and Support Engineer Capability (Bridging and Crossing)	2018–2031	\$1bn–\$2bn



Program title	Program Timeframe	*Approximate investment value
Overlander – Medium and Heavy Vehicles	2018–2026	\$1bn–\$2bn
Battlefield Command Systems – Tranche 2	2016–2021	\$750m–\$1bn
Tactical Intelligence, Surveillance and Reconnaissance Aircraft	2016–2026	\$750m–\$1bn
M1 Main Battle Tank Upgrade	2018–2027	\$750m–\$1bn
Long-range Rockets	2023–2030	\$750m–\$1bn
Artillery Systems and Ammunition	2016–2028	\$500m–\$750m
Armed Reconnaissance Helicopter Assurance Program	2017–2026	\$500m–\$750m
Canberra Class Ship – Amphibious Integration	2019–2025	\$500m–\$750m
Blamey Barracks Kapooka Redevelopment	2021–2026	\$500m–\$750m
Armoured Vehicles – Training Vehicles	2023–2032	\$400m–\$500m
Deployable Battlefield Logistics	2020–2027	\$300m–\$400m
Canberra Class Amphibious Ship Transport Vessels	2025–2033	\$300m–\$400m
Chemical, Biological, Radiological and Nuclear Defence Program	2016–2022	\$200m–\$300m
Engineer Support Platforms	2017–2026	\$200m–\$300m
Larrakeyah Barracks Darwin Redevelopment	2017–2022	\$200m–\$300m
Campbell Barracks Redevelopment	2017–2021	\$200m–\$300m
Riverine Patrol Craft	2018–2028	\$200m–\$300m
Shoalwater Bay Training Area Redevelopment	2016–2021	\$100m–\$200m
Irwin Barracks Redevelopment	2017–2022	\$100m–\$200m

\*The figures in the table cover the acquisition element of the programs. There will be additional investment in whole-of-life sustainment and operating costs for each program. All figures are calculated on an out-turned price basis.

