

ADF capability snapshot 2015

Part 3—Army

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This paper surveys the capabilities of the Australian Army and is an update of previous reviews in [2008](#) and [2010](#). Other papers in this series update the corresponding reports on Royal Australian Air Force, Royal Australian Navy and a future paper will examine C4ISR (command, control, communications, computers, intelligence, surveillance and reconnaissance) capabilities.

Army capability summary

The main focus of the Australian Army over the past 15 years has been on sustaining combat, training, stabilisation and peacekeeping operations in our near region and the Middle East and Afghanistan theatres. The demands of the ADF's operational tempo have driven a major rethinking of the structure of the Army under Plan Beersheba. Now well advanced, the end state will be three essentially similar brigades, which will make rotational deployments easier to manage and sustain. Like the [RAAF](#) and the [RAN](#), described in previous reports in this series, the Army needs a major recapitalisation of its equipment.



An ASLAV (Australian Light Armoured Vehicle) fires a target at Puckapunyal training area during Exercise Chong Ju, a live-fire training exercise by the Combined Arms Training Centre, on 21 October 2015. Photo courtesy Department of Defence.

The replacement of the Army's fleet of vehicles is now underway. The requirement for protected mobility for deployed forces has increased as the sophistication and capabilities of both contemporary militaries and non-state actors have increased. Soft-skinned vehicles are particularly vulnerable to even small improvised explosive devices (IEDs). The Bushmaster vehicle has shown itself to be capable of providing adequate levels of protection but is marginal against plausible future threats. The Army also has a large fleet of armoured fighting vehicles (AFVs); the ASLAV light armoured reconnaissance vehicle has also performed well on operations but is due for replacement, while the Army's fleet of M113 armoured personnel carriers is essentially obsolete. These are recognised capability shortfalls, and projects to replace all of those vehicle types are in Defence's Integrated Investment Plan.¹

The agile and adaptive enemy in Afghanistan and the threat posed by IEDs often outpaced Defence's methodical but frequently slow formal procurement processes, which might be suitable for long-term recapitalisation projects but aren't geared for quick responses. A number of force protection and other measures have been developed and deployed under rapid-acquisition processes and have provided deployed forces with valuable capability. The Army's 'Digger Works' collaborative developmental program, staffed by Army personnel in what were then the Defence Materiel Organisation and the Defence Science and Technology Organisation, led to a number of innovative solutions for personal protection being fielded in the past five years. Operational pressures are good for cutting through red tape, but capturing the recent progress and embedding that flexibility into peacetime processes back in Canberra won't be easy.

In the past half-decade, the modernisation of the Army's aviation capability has made less progress than planned. Both major helicopter projects—the replacement of the Black Hawk with the MRH-90 as the battlefield mobility helicopter and the introduction of the Tiger armed reconnaissance helicopter—have spent time on the Projects of Concern list, and both are running years behind schedule. One bright spot has been the purchase of new-build CH-47F Chinook medium-lift helicopters bought 'off the shelf' and delivered ahead of schedule, boosting medium-lift capability. The Army has also gained valuable experience in operating with unmanned aerial systems during operations in Afghanistan.

Since 2010, the Army has taken delivery of M777A2 ultralight towed howitzers, which have replaced the previous 105-mm guns and 155-mm artillery pieces. The lightweight design of the new howitzers allows for greater air mobility, and the greater range of the 155-mm weapon improves on the 105-mm Hamel gun. The M177A2 also has greater accuracy and is compatible with allied fire control data networks.

There's been an effort to digitise the Army's networks and to develop greater joint capabilities across the ADF. This has been partially successful, but the Army still has two distinct battlefield networks, and elements of its digitised network—especially the Tiger helicopter—are now bespoke configurations and will be difficult to upgrade in future.

As noted in ASPI's 2010 capability review, the Army has performed commendably in raising, training and sustaining deployed forces. The most strain has been felt in some specialist areas (such as engineers, intelligence specialists and special forces), where relatively low personnel numbers mean multiple deployments for individuals when operations continue for years at a time. That can put a strain on families, but morale seems to be high and there's no suggestion of a collapse of capability to sustain forces in the field.

In fact, one of the challenges that the Army will face in years to come is the retention of operationally experienced personnel as operations wind down and less professionally and financially rewarding domestic postings become the norm. And another consequence of sustained operations is a growing post-deployment aftercare workload as awareness of stress-related injuries grows. Looking after the Army's wounded, injured and ill is a high priority for Army leadership.

Table 1: Significant Army capability changes since ASPI's last update in 2010

Capability	Change	Comment
Artillery	↑	Since 2010, the Army has taken delivery of 54 M177A2 ultralight towed howitzers, which have replaced the previous 105-mm and 155-mm artillery pieces. The new howitzers allow for greater air mobility of indirect fire support.
Small arms	↑	In June this year, 1RAR received the enhanced EF88 Steyr rifle in preparation for the weapon's rollout to the rest of the Army, which has used the F88 Steyr since 1988.
Personal protection	↑	The Army and the former Defence Science and Technology Organisation's experimental program and a number of rapid acquisitions have improved the quality of body armour and other protective systems deployed into hazardous operational environments.
Ground mobility	↑	Under Project Overlander, the Army is replacing its fleet of soft-skinned vehicles and trailers for general mobility. More than 2,000 vehicles and 1,300 trailers have been delivered to date.
Protected mobility	↑	Continuing deliveries of Bushmaster vehicle variants have improved the Army's overall capability for mobility in hazardous environments.
Armoured fighting vehicles	↓	It's not that the Army's armoured capability has declined, but potential operational environments have become more dangerous. The ASLAV has delivered sterling service but has reached the end of its potential for adding further armour. The M113 armoured personnel carrier is no longer fit for purpose in anything but a benign operational environment. Project LAND 400 will replace both those vehicle types and will also provide a manoeuvre support vehicle.
Aviation	–	A mixed report card. Delays in getting the MRH-90 and Tiger helicopters into service have meant continuing with the increasingly dated (but still effective) Black Hawk fleet for battlefield mobility and a shortfall in airborne armed reconnaissance capability. The acquisition of seven new-build CH-47F Chinooks has boosted medium-lift capability.
Command and control	–	Also a mixed report card. The Army has made significant progress in digitising its systems, but has not had the advantage of 'off-the-shelf' systems that have assisted the other services. As a result, the Army will need to work carefully with current projects to integrate their systems into a common C4I architecture.

Table 2: Army capability shortfalls

Capability	Risk assessment	Comment
Protected mobility and armoured fighting vehicles (AFVs)	Medium	While the Army has begun to replace its fleet of protected mobility vehicles and AFVs, it still has a large number that aren't suited to the modern threat environment, especially the M113 armoured personnel carriers. Projects LAND 116 (Bushmasters), LAND 121 (general purpose vehicles) and LAND 400 (AFVs) should address the problem in time.
Airborne armed reconnaissance	Medium to low	The Army has had only limited capability for airborne armed reconnaissance since the Iroquois helicopter was retired over a decade ago. Delays in the delivery of full capability of the Tiger helicopter mean that this remains a capability gap. After considerable delays the Tiger should reach full operational capability in early 2016.
Land-based air defence	Medium	The Army has only a limited short-range ground-to-air capability, despite a replacement higher performance system being in various capability plans for at least 20 years. While its recent operating environments have involved few or no air threats, the likely proliferation of armed drone systems should make this capability a higher priority today.
Lack of depth in specialised personnel	Medium	The Army has specialised corps, such as intelligence, medical and combat support services, in which it lacks the depth provided in other areas by Plan Beersheba. Due to a lack of numbers, these are essentially 'one-shot' capabilities rather than the three-deep model found elsewhere.

Because the Abbott government chose to continue to consider and approve projects in parallel to developing its Defence White Paper—thus wisely avoiding the ‘famine and feast’ model of previous White Papers—there isn’t a big backlog of projects in the Integrated Investment Plan. The most recent major project approval was for the acquisition of Hawkei light protected vehicles under Project LAND 121.

Table 3: Major Army platform and system approvals since 2010

Project	Number	Comment
Counter Rocket Artillery and Mortar (LAND 19)		Designed on the basis of experience in Uruzgan Province in Afghanistan, the project delivered a counter-rocket, artillery and mortar/missile (C-RAM) sense and warn capability in 2013. The C-RAM system is designed to increase the level of force protection for deployed forces, providing early detection and warning against enemy indirect fire threats. This gives troops in forward operating areas time to respond appropriately, resulting in increased survivability. This project was completed and integrated into service in 2014.
General mobility vehicles (LAND 121)	1,100	The purchase of 1,100 locally built Hawkei protected vehicles and more than 1,000 trailers under Phase 4 of LAND 121 was announced in October 2015 , for delivery from 2018.
Protected mobility (LAND 116)	315	Additional Bushmaster vehicles are being purchased in two tranches. The first tranche of 101 was announced in May 2011 , and the remaining 214 in July 2012 .

Overview

With a 2015–16 budget year plan for 29,528 permanent personnel (rising to 31,018 in 2017–18) and around 14,000 part-time Army Reserve personnel, the all-volunteer Australian Army is small by regional standards (and tiny given the size of our continent). Structured as a standing force rather than a mobilisation base, the Army is designed to be able to deploy and sustain a brigade group of around 3,000 troops indefinitely while retaining the capacity to concurrently deploy a battalion group of around 1,000 temporarily. Larger scale deployments are possible for limited periods—as occurred in East Timor in 1999.

At its core, the permanent Australian Army is currently made up of three combat brigades. In the past, the three consisted of one each of infantry, motorised and mechanised brigades. Today, in order to improve the sustainable deployability of the Army, Plan Beersheba has reorganised the structure into three similarly configured combined-arms multi-role manoeuvre brigades. The basic idea is that three similar brigades are more interchangeable than three more specialised ones, allowing for more seamless transitions when extended deployments are required. The Army Reserve has been similarly restructured and better integrated with the regular combat brigades to provide an essential ‘round-out’ capability.

In and around the brigade structure, the Army as a whole consists of six standard infantry battalions, an amphibious battalion, three artillery regiments, two cavalry regiments, one armoured regiment, one commando regiment and the Special Air Service Regiment (details of the Army’s structure can be found in the [Army Aide Memoire](#).) There are also three combat engineer regiments and an air defence regiment, as well as a comprehensive range of combat support and logistic support elements. In practice, many of the elements established as regiments are on a smaller than regimental scale, but Australian Army formations aren’t designed to deploy as regiments in any case. Rather, required elements are tailored into reconfigurable combined-arms ‘battlegroups’, commanded by battalion/regiment-level headquarters, as mission needs dictate.

The Army is developing and expanding its capability to conduct amphibious operations. The main driver is the delivery of two Canberra-class LHD amphibious ships, which are a quantum leap from the ADF’s previous amphibious capability and capacity. Each vessel can deliver a battalion group (an infantry battalion plus supporting elements and vehicles, totalling about

1,000 people), which far outstrips the Army's previous amphibious-ready capability. Working up what could amount to a dedicated marines capability is a resource-intensive task, and the Army is wisely taking a staged approach. The first elements to work up will be an amphibious aviation combat team and an amphibious-ready element of 2nd Battalion Royal Australian Regiment (2RAR) within 3 Brigade. Further amphibious capability will be developed later as priorities dictate.

In the past, the Army Reserve mostly provided individual personnel to help round out permanent force deployments, along with up to company (100–120 personnel) size Reserve units for deployment to low-intensity regional stabilisation operations, such as those in East Timor and Solomon Islands. Reservists, including specialists such as medical personnel, have served in frontline operations in Afghanistan and elsewhere. Like the full-time Army, the Reserve has been restructured under Plan Beersheba. Each full-time brigade has two paired Reserve brigades which, when required, can now provide a battle group headquarters, three infantry companies as the bulk of a third infantry battalion to round out the full-time brigade, and some specialist elements. Those arrangements have been successfully tested in exercises. However, neither plans nor adequate equipment holdings exist for a large-scale mobilisation of the Reserve, despite it retaining a structure of six nascent brigades.

Legislation allows the Reserve to be called out for full-time service in a broad range of circumstances, and former permanent force personnel remain liable for call-out for five years after separation. The ADF's Plan Suakin is designed to produce a 'total workforce model' that enables greater mobility between full-time and part-time ADF positions. Reserve formations are scattered around the country broadly in line with population centres.

As in the other services, the ability to collect, manipulate and disseminate intelligence, tactical information and positional data is critical to the Army's effectiveness. These issues will be developed further in a future paper on the ADF's C4ISR capability.

Capability

The Army's greatest recent challenge has been sustaining the specialist support to deployed forces. As noted above, decade-plus deployments have meant that some personnel have been repeatedly rotated into theatre. This is especially true of specialist troops, including engineers, intelligence corps personnel, commandos and the Special Air Service Regiment. And the nature of the conflict in Afghanistan in particular meant that there needed to be a focus on counterinsurgency. The ability to engage the local population, including a greater capacity for gathering human intelligence and cooperating with local civic and military authorities, requires specialised skills.

While conducting live operations, the Army had to develop and train for new operational techniques with relatively few spare resources. That was most acutely felt in combat engineering and logistics. With the recent scaling down of deployments, the Army should have the resources to consolidate its existing capabilities and reshape them under Plan Beersheba.

In terms of platforms, the Army needs to recapitalise its extensive fleet of vehicles, and its aviation remains a work in progress. Vehicle replacement is already underway under projects LAND 121 (general and protected mobility vehicles) and LAND 400 (AFVs). It has already replaced its artillery, and its tanks are only a decade old, although probably due for a technological refresh in the not too distant future. The Army has had a tough run with its aviation assets. What the 2010 ASPI review called the 'bedding down into service of the Tiger armed reconnaissance helicopter and MRH-90 multi-role helicopters' has turned out to be a five-year development task that isn't finished yet. While the Black Hawk fleet has been able to cover for the MRH-90, the lack of a working armed reconnaissance helicopter means that Australian forces in Afghanistan were reliant on American and NATO forces for that capability.

Another significant equipment shortfall for the Army is the lack of a modern ground-based air defence system that can deploy with land units. There have been entries for that capability in Defence Capability Plans going back 20 years, but they've never achieved the priority required for development for final approval. The Army's recent operations haven't required such a capability due to the lack of a credible air threat but that mightn't always be the case, especially as unmanned aerial systems proliferate.

Being more personnel-based than the Air Force or Navy, the Army is the service most able to expand or contract as circumstances demand. And because it doesn't have large and expensive platforms (compared to advanced combat aircraft or warships), it's also the most susceptible to 'penny packeting', such as cutting back a large fleet of vehicles or spreading purchases over longer periods. The Army also seems to be the poor relative in terms of major projects, consistently receiving a smaller fraction of the capital investment budget than the other services. That affects the types of operations that it can prepare for. For example, while the Army has identified a trend towards higher lethality in battlefield and complex urban operations—of the type currently taking place in the Middle East and elsewhere—the 2009 Defence White Paper explicitly ruled out such operations. Possibly because of that, a plan to acquire self-propelled artillery to complement towed artillery [was shelved](#) more than two years after a tender process had closed.

The biggest ticket item on Army's shopping list is the replacement of its existing fleet of armoured fighting vehicles under Project Land 400. Phase 2 of Land 400 is currently underway to select a combat reconnaissance vehicle replacement for the ASLAV. Subsequent phases will deliver a fleet of infantry fighting vehicles, manoeuvre support vehicles and an integrated training system. There are a range of very good contenders for each vehicle type, each offering a different combination of firepower, manoeuvrability and protection.

There's a trend towards increased protection against IEDs and other threats but greater protection generally comes at a greater cost, and the Army's ability to replace its entire fleet will depend on the availability of sufficient resources. In 2010, ASPI noted that a significant and wide-ranging upgrading of the Army's protected mobility vehicles and armour wasn't guaranteed, given the 2009 Defence White Paper's naval initiatives. Not much has changed—the August 2015 announcement that the two major naval shipbuilding projects were being brought forward to the next few years, plus the looming \$20 billion-plus submarine project, mean that the Army will again have to fight to make its case.

Individual components of Army capability are examined below. Although an examination based on force elements is unavoidable, it's important to note that the Army prepares for combined-arms operations that integrate and closely coordinate the full range of land capabilities.

Infantry

As a light- to medium-weight force, the Australian Army is built around its infantry. As part of an integrated land force, infantry can be employed with other elements (armour, artillery, engineers and so on) to form combined-arms teams and to effectively work with the Navy and Air Force to produce joint capabilities.

The Army's infantry structure consists of six standard infantry battalions (1, 3, 6, 5, 7 and 8/9 RAR) and one amphibious battalion (2RAR). Infantry weapons and equipment are of a similar standard to those of other advanced Western armies. In recent years, a priority has been placed on acquiring protected mobility, and recent operations have seen the rapid acquisition of some items, including specialist clothing, body armour and man-portable Javelin anti-armour missiles. Planned acquisitions of infantry equipment in the next decade include new mortars (another item that's been in planning documents for at least 20 years), direct fire weapons and small arms. The Army has begun the rollout of the EF88 Steyr rifle, an upgraded and more versatile version of the now 30-year-old F88 Steyr design.

Special forces

Over the past decade, Australia's special forces have been expanded and unified under a separate command within the Army. Headquartered in Canberra and Bungendore, the key elements of the special forces include the Special Air Service Regiment in Western Australia, and a commando regiment, Special Forces Training Centre, Special Operations Logistic Squadron and Special Operations Engineering Regiment (formerly the Incident Response Regiment) in Sydney. A Reserve commando regiment is split between Sydney and Melbourne.

Well-equipped and able to deploy by land, sea or air, special forces provide a flexible range of capabilities, from long-range patrol through to strike raids and special recovery operations. An expanded role in domestic counterterrorism emerged for special forces after 2001, and standing squadron-strength tactical assault groups are now maintained on the east and west coasts. The Special Operations Engineering Regiment provides a capacity to respond to a nuclear, chemical, biological or radiological event within Australia.

For more on Australia's special forces, including an extensive discussion of possible future roles, see ASPI's 2014 publication [*A versatile force: the future of Australia's special forces capability*](#).

Armour

Tanks

The Army's tank force consists of 59 refurbished Abrams M1A1-AIM main battle tanks acquired from the US in 2007. The M1A1-AIM is one of the more capable variants in the Abrams family, and its acquisition brought a substantial increase in capability over the previous Leopard tank.

The value of tanks to the Australian Army has been questioned at times, and the Abrams have been the subject of some ill-informed criticism over the years, mostly about their weight and an inferred lack of deployability. In fact, the world market for main battle tanks that are survivable against a range of threats likely to be encountered on the modern battlefield is quite limited, and other credible contenders were of similar or greater weight. The Abrams provides good protection against the early-generation shoulder-fired anti-armour weapons now prevalent in our region but, like all tanks, is more vulnerable to advanced systems proliferating elsewhere, including in the Middle East. However, the most recent generation (M1A2) is planned to remain in service with US forces until at least 2050. With occasional upgrades, Australia's current M1A1 fleet will probably have a long service life.

Over time, the trend in the Army's tank fleet has been towards lower numbers of individually more sophisticated and capable platforms. The 59 Abrams replaced 101 Leopards, which had replaced 143 Vietnam-era Centurions. This trend isn't unique to the Army or to tanks; keeping pace with technological developments is costly, which puts stress on the procurement budget and puts downwards pressure on numbers. One of the questions that have to be grappled with is how specialised capabilities such as tanks fit within Plan Beersheba. Given the numbers, it will be a challenging task to split the current tank squadron into three elements to provide an organic armour capability to each of the three brigades while retaining critical mass and adequate support capability. The Army is currently looking at all options to best sustain a tank capability in each of the three combat brigade locations. An additional purchase of more M1A1s would make it easier to implement the three brigade model for armour.

Australia hasn't deployed a tank outside Australia since the end of the Vietnam War. The C-17 Globemaster is capable of transporting a single Abrams tank if required—although that would be an inefficient use of airlift capability. However, a Canberra-class LHD can transport dozens of Abrams tanks at once, along with troops, light armour and helicopters. Australia's capability to unilaterally deploy and support heavy armour has never been stronger.

Armoured fighting vehicles

Other than tanks, the Army operates two types of armoured mobility vehicle: the US-designed M113 armoured personnel carrier and the Canadian-built ASLAV light armoured vehicle. Its armoured vehicle fleet is on the cusp of a major recapitalisation involving replacements planned under project LAND 400 for both vehicle types.

The tracked M113 armoured personnel carrier has been in service with the Australian Army since 1965. It provides mobility, protection and firepower for up to 10 personnel. A substantial fraction of the 700+ vehicles in inventory were upgraded and returned to service with improved armour, firepower, suspension, engines and drive trains at a cost of \$768 million. After a protracted project that spanned almost 20 years, the first upgraded vehicles entered service in late 2007, but they aren't suited to the contemporary environment. While the upgraded vehicles protect occupants against small arms, anti-personnel mines, light

anti-armour weapons and shrapnel, they'll remain vulnerable to 12.5-mm or larger projectiles, medium to heavy anti-armour weapons, large IEDs (due to the M113's flat-bottom hull design) and anti-armour mines. This is a major capability gap (and was identified as such by the Australian National Audit Office), so the M113s are to be replaced under the LAND 400 project.

The 8x8 ASLAV (Australian Light Armoured Vehicle) is an Australian version of General Dynamics Canada's LAV-25. Variants exist for reconnaissance, personnel carrier, command, surveillance, ambulance, fitter (maintenance support vehicle) and recovery roles. Purchases through the 1990s and 2000s have brought the total fleet to 257 vehicles, the last of which was delivered in 2007. The ASLAV can carry eight troops in the armoured personnel carrier variant or four in the gun variant, which is equipped with a turret-mounted 25-mm gun. While the ASLAV offers superior protection against IEDs, its protection against light anti-armour weapons and ballistic projectiles is inferior to that of the M113.

ASLAVs have been deployed for operations in Iraq and Afghanistan since 2004. Planned protective upgrades for the vehicles were announced in 2010 under LAND 112 Phase 4, but the \$302.8 million upgrade project was abruptly cancelled in late 2011. The project was to include ballistic-protected drivers' seats and improved mine-resistant belly plates. According to the Australian National Audit Office, the ASLAV upgrade project was cancelled after expenditure of roughly \$25 million, along with cancellation costs of \$11 million. No alternative upgrades have been slated for the ASLAV fleet, although the need presumably still exists. However, an in-theatre modification added 'bar' armour for protection against RPGs.

In February 2015, Defence issued a tender for the replacement of the ASLAV with a more modern design that offers better protection. Tender submissions were due in September 2015. Any significant delays could create a critical capability gap as the ASLAVs start reaching the end of their service life in about 2020.

Taken together, the Army's eventual fleet of more than 1,500 AFVs will provide protected mobility (at various levels of protection) and firepower for two cavalry regiments and seven to eight infantry battalions and some supporting elements, depending on how assets are allocated. The replacement of such an extensive fleet will be an expensive exercise, and there's likely to be some tension between the capability and numbers sought and the money available.

Land transport

The entire Army depends extensively on motorised transport, so its fleet of general purpose vehicles is large—some 7,500 vehicles and 4,000 trailers. The current fleet consists of militarised fleets of light and lightweight Perentie Land Rovers, Unimog 4-tonne trucks, Mack 8-tonne trucks, International S Liner prime movers and general service trailers. The Army also requires protected mobility vehicles for deployments in hazardous environments.

Although the existing fleet was purchased progressively over three decades, Defence Capability Plans have long included LAND 121 'Overlander', a single overarching multi-phase project designed to replace the fleet of 7,500 vehicles. The attraction is commonality across the family of vehicles, with the aim of reducing whole-of-life costs and rationalising vehicle types and numbers. In practice, replacing the fleet in a series of coordinated purchases has proven difficult, and progress has varied by vehicle type. And the operational experience in Iraq and Afghanistan has led to a move from soft-skinned to protected vehicles for some of the Overlander vehicles.

Phase 3A of Overlander is acquiring 2,146 Mercedes Benz G-Wagon lightweight vehicles and 1,799 Haulmark trailers. The relevant [Defence fact sheet](#) notes that the G-Wagon and its range of trailers and modules are:

...designed to be used by the Australian Army for tactical training, supporting disaster relief and securing Australia's coastline. Variants include 4x4 and 6x6 all-wheel drives and an extensive range of modules, providing the flexibility to undertake a wide range of tasks in difficult off-road conditions.

Light protected mobility vehicles (PMV-Ls) are an important component of the vehicle fleet. Given the dispersed nature of the threat in environments such as Afghanistan, all vehicles need to provide enhanced protection against ballistic projectiles and blast. Consequently, [Overlander Phase 4](#) will upgrade the light and lightweight vehicle classes with new vehicles with enhanced survivability, mobility, payload carrying capacity and connectivity. The purchase of 1,100 locally built Hawkei protected vehicles and more than 1,000 trailers under Phase 4 of LAND 121 was [announced in October 2015](#), for delivery from 2018. These vehicles will be provided to the Army's combat units and the Air Force's Airfield Defence Guards. Together, the Hawkei and G-Wagon vehicles will replace the previous Land Rover 4x4 and 6x6 vehicle fleets. Replacing the soft-skinned Land Rover with the protected Hawkei is another step forward in protection for Army personnel.

The 4x4 Bushmaster protected mobility vehicle is capable of carrying up to 10 people. It isn't designed as a fighting vehicle, although there are variants with the MAG-58 remotely operated weapons system. Its roof-mounted machine gun gives it inferior firepower to the ASLAV, but it has proven to be a rugged and reliable vehicle that provides similar protection to an ASLAV against ballistic projectiles and superior protection against mines and IEDs. For that reason, it's been well suited to the Army's recent operations in Afghanistan. Follow-on orders for another 315 placed in 2011 and 2012 leave a fleet of around 1,000 Bushmasters.

Aviation

Transport

The Army no longer operates any fixed-wing aircraft. Its air transport capability currently comprises a mix of Black Hawk (34) and MRH-90 battlefield helicopters (from a pool of 46 shared with Navy) and seven CH-47F Chinook medium-lift helicopters. The Black Hawk can carry eight fully equipped soldiers and the twin-rotor Chinook thirty-three. The European-designed MRH-90 is a medium-lift helicopter with capacity for 12–14 fully equipped troops. In practice, the resulting deployable single-lift capacity would be enough for several infantry companies but not a battalion.

The delivery and working up to final operational capability of the MRH-90 have taken years longer than expected, and the procurement was placed on the Projects of Concern list at one stage. Any capability shortfall has been ameliorated by the continuing serviceability of the Black Hawks, although shortcomings in their self-protection systems meant that they weren't deployed to Afghanistan, often leaving the ADF to rely on coalition assets for mobility. The self-defence suites on the Army's now retired CH-47D Chinook helicopters were progressively improved over previous years, and the aircraft was used operationally in theatre.

The replacement seven F-model Chinooks were an essentially off-the-shelf purchase through the US Foreign Military Sales program. They incorporated only minor Australian-specific equipment changes, including the fitting of crashworthy crew and passenger seating, miniguns and underfloor ballistic protection. As is frequently the case with such purchases, the aircraft were delivered ahead of schedule and within budget.

Aerial reconnaissance and fire support

Forty-one Kiowa light observation helicopters provide the Army with a flexible aerial reconnaissance capability. However, since the retirement of the last six Iroquois gunships in 2004, the Army has been without a dedicated aerial fire support platform. The replacements for both capabilities—22 Tiger armed reconnaissance helicopters—were initially due to enter service in 2004–05. After lengthy delays, the aircraft are expected to be declared at final operational capability in early 2016. While Australia's capability has been struggling, French forces have flown combat missions with Tigers in Afghanistan, Libya and Mali, which suggests that the Australian problem wasn't so much the airframe as the command and control and fire control systems architectures that we were trying to fit it into.

Designed as an anti-tank attack helicopter for the European front in the Cold War, the Tiger will be a much more capable platform than either the Kiowa or the Iroquois in their respective roles. But the purchase of only 22 aircraft will mean fewer flying hours, more limited concurrency for reconnaissance and a loss of the flexibility provided by the utility Iroquois. (Kiowas will be retained as training platforms until a dedicated replacement is acquired under the [Helicopter Aircrew Training System](#) project, which is expected to reach initial operating capability in 2018.)

Artillery

The last of the Army's Hamel L119 105-mm light guns was placed on reserve in November 2014, as the entire inventory has been replaced by the M777A2. The Army has received a total of 54 M777A2 155-mm ultralight towed howitzers under the LAND 17 project, resulting in a numerically smaller artillery capability but one that's fully digital and compatible with advanced guided munitions.

The M777A2 is a substantial upgrade on the L119, increasing the range of unassisted conventional rounds from around 14 kilometres to 24 kilometres. The M777A2 also has the benefit of compatibility with 155-mm guided projectiles, such as the M1156 precision guidance kit and the M982 Excalibur, which has a reported maximum range of 57 kilometres and an accuracy within 20 metres. The M777A2 can be connected to Australian and allied networks to improve accuracy in various conditions, making for a much more modern weapon than its 20-year-old predecessor. Its light weight (4.1 tonnes, compared to the M198 155-mm gun's 7.3 tonnes) makes it much more air portable with Chinook helicopters. With a maximum slung load of 11 tonnes, a single aircraft can deliver greater quantities of ammunition and other stores with the guns.

An initial order of 35 M777A2s was to be complemented by around 18 self-propelled howitzers as part of LAND 17 Phase 2, but that phase was scrapped in mid-2012 as a cost-cutting measure. Instead, the Army received an additional tranche of 19 M777A2s.

For direct fire support, the Army still operates 81-mm man-portable mortars with a maximum range of around 5 kilometres. The LAND 136 mortar replacement achieved first-pass approval in 2011–12, and the 2012 Defence Capability Plan indicated plans for a decision by 2014–15. That date has passed with no indication of what possible replacements might be on the table. A larger mortar (such as a 120-mm system) would provide a rapidly deployable indirect fire support asset with a range of 8 kilometres or more (depending on the munitions) and with a much smaller logistics footprint than artillery.

Engineers

The Army maintains a large number of engineering capabilities. The heaviest capabilities are the construction engineering units, which can build infrastructure for deployed forces or deliver projects as part of civil action programs, as in Afghanistan today. As an integral part of a combined-arms team, combat engineers provide a range of capabilities, including bridging, the construction of field defences and the elimination of physical obstacles. However, the Army's current combat engineer capability lacks the protection needed to support manoeuvre operations in all circumstances.

Other units are more specialised; for example, the Special Operations Engineering Regiment can respond to chemical, biological, radiological and nuclear incidents in Australia or in support of deployed forces.

Air defence

Following the retirement of the Rapier surface-to-air system in 2005, the Army's air defence capability now comprises a regimental headquarters and two batteries equipped with the short-range RBS-70 system. With a range of 8 kilometres and a ceiling of around 16,000 feet, the man-portable RBS-70 provides local protection against low-flying aircraft and helicopters but is ineffective against high-altitude aircraft and medium-range stand-off weapons. The RBS-70 is further limited because it uses a laser-guided missile that requires manual guidance to intercept targets.

The 2009 Defence Capability Plan included an enhancement or replacement of the RBS-70 system, but gave a timeline of only 'beyond 2013'. Previous indications were for a \$1 billion project, with a delivery date around 2018. That no longer seems to be the case, as the 2012 Defence Capability Plan included only a counter-rocket, artillery and mortar/missile (C-RAM) capability to build on the rapid acquisition of C-RAM systems and their deployment into Afghanistan in late 2010. These are, by definition, short-range systems designed to intercept incoming projectiles and have little overlap with genuinely medium- to long-range air defence systems.

A long-range wide-area defence system like the American Patriot missile is probably beyond the Army's realistic budget aspirations, and it's hard to foresee the operational concept that might require such a capability. However, the proliferation of advanced air-to-ground weaponry and unmanned platforms capable of reconnaissance, surveillance and strike missions means that countering the air capabilities of even relatively unsophisticated adversaries could require an improved short- to medium-range system. Otherwise, the Army will have to rely on other ADF force elements (such as RAAF aircraft or the Navy's air warfare destroyers) or coalition assets to protect against even moderately capable air threats.

Logistics and combat support

The Army has to be able to support a wide range of combat capabilities in adverse environments over large distances. The necessary logistic and combat support capabilities include health, construction, survey, intelligence, surveillance, transport, signals, equipment repair, equipment maintenance, engineering and the resupply of fuels, stores, munitions, rations and water. A detailed analysis of these many specialised areas is beyond the scope of the broad assessment attempted in this report.

The critical question is whether the scale, quality and range of logistic and combat support align with the possible demands of the Army's combat elements. The answer is a qualified 'yes'. By the end of the 1990s, the Army's support capabilities had degraded significantly following an extended period of budget-driven constraints and limited operational demand. But a higher priority was placed on support capabilities after the experience of the East Timor deployment in 1999. New investments have been made in a number of areas and personnel have been allocated to remove hollowness in support units. ASPI's 2010 Army capability report noted that the Army was much better placed to support and sustain deployments than it had been a decade earlier.

Nonetheless, problems with recruitment and retention in some specialist trades, such as specialised medicine, logistics and intelligence, are a constant concern. In principle, Plan Beersheba will add depth to support areas by making each brigade more self-sufficient. However, they remain in many instances 'one-shot' capabilities rather than Beersheba's 'one ready (or deployed), one readying and one resetting' ideal. The net result is multiple rapid-rotation deployments for some key personnel. Plan Suakin will enable specialists to more easily transfer between full-time and part-time ADF employment, which would improve the retention of skilled people and allow specialist capabilities to be fleshed out.

In addition, the ADF has employed private-sector logistic support in East Timor, Solomon Islands, Iraq and Afghanistan. This has helped to reduce the demands made on the Army's organic support capabilities. Generally speaking, the ADF has learned how to make good use of private contractors where it's operationally feasible to do so.

Notes

- 1 The Defence Capability Plan has been retitled the Integrated Investment Plan following the 2015 First Principles Review of Defence.

Acronyms and abbreviations

ADF	Australian Defence Force
AFV	armoured fighting vehicle
C4ISR	command, control, communications, computers, intelligence, surveillance and reconnaissance
C-RAM	counter-rocket, artillery and mortar/missile
IED	improvised explosive device
LHD	landing helicopter dock
NATO	North Atlantic Treaty Organization
RAAF	Royal Australian Air Force
RAN	Royal Australian Navy

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