ASPI
AUSTRALIAN STRATEGIC POLICY INSTITUTE

The Cost of Defence

ASPI Defence Budget Brief 2021–2022

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One hundred & twenty-two million, two hundred & forty-two thousand, seven hundred & thirty-nine dollars & seventy-three cents per day.

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Cover graphic drawn by Geoff Pryor.
Reproduced courtesy of the artist.

About ASPI

The Australian Strategic Policy Institute was formed in 2001 as an independent, non-partisan think tank. Its core aim is to provide the Australian Government with fresh ideas on Australia's defence, security and strategic policy choices. ASPI is responsible for informing the public on a range of strategic issues, generating new thinking for government and harnessing strategic thinking internationally. ASPI's sources of funding are identified in our Annual Report, online at www.aspi.org.au and in the acknowledgements section of individual publications. ASPI remains independent in the content of the research and in all editorial judgements. It is incorporated as a company, and is governed by a Council with broad membership. ASPI's core values are collegiality, originality & innovation, quality & excellence and independence.

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Note on title: The figure of $122,242,739.73 represents the daily average of the 2021–22 defence funding line (including the Australian Signals Directorate) of $44,618.6 million presented in the 2021–22 Defence Portfolio Budget Statements.

Contents

Executive Director's foreword

This year is ASPI's 20th anniversary. This is also the 20th edition of *The cost of Defence*. Our analysis of the Defence budget was first published in ASPI's second year and has been a constant in ASPI's journey ever since.

Over those 20 years, *The cost of Defence* has played a central role in fulfilling the three purposes for which the Australian Government first established ASPI:

- Provide alternative sources of input to government
- Help nourish public debate and understanding
- Contribute to the development of professional strategic policy expertise in Australia.

Beginning with the very first edition, we have published on the cover the daily defence budget. Back in 2002–03, it was $39,991,890.63. We've now reached $122,242,739.73. It is by any standard a lot of money, and we're very proud of ASPI's record in helping the Australian public understand how it's being spent as well as offering policymakers informed suggestions on how it can be spent better.

Over those 20 years, I haven't seen as uncertain and potentially dangerous a strategic environment as the one Australia currently faces. This isn't a time for Defence to conduct business as usual. Rather, the need is for quick action and lateral thinking to strengthen Australia's national security. More than ever before, it's important for Australians to have a clear understanding of that environment and informed debate about our options to navigate through the strategic challenges we face.

Last year, the government released its Defence Strategic Update (DSU)—a document quite remarkable for its frank assessment of our environment. ASPI published a special edition of *The cost of Defence* examining the DSU. While it's a clear-sighted document, the plan and priorities that the DSU laid out will need to be constantly reviewed and updated. To that end, ASPI's annual conference in June this year will focus on the DSU.

The development of this report was largely funded by ASPI's annual block grant from the Department of Defence, which is currently $4 million (or $10,958.90 per day).

Peter Jennings

Executive Director

Executive summary

Once again, the Australian Government has delivered exactly the funding it promised in the 2016 Defence White Paper (DWP) and subsequent 2020 Defence Strategic Update (DSU). If the government was willing to recommit to the DWP's funding line in the depths of the Covid-19 recession, it was very unlikely to walk away from it now that the economy is recovering faster than expected.

This year, the consolidated defence funding line (including both the Department of Defence and the Australian Signals Directorate) is $44.6 billion, which is real growth of 4.1%. It's the ninth straight year of real growth, and, according to the DSU's funding model, that will continue until the end of the decade.

Defence funding 2021–22	
Consolidated defence funding (including Australian Signals Directorate), 2021–22	
Funding:	$44.619 billion
Share of GDP:	2.09%
Real growth on prior year:	4.1%
Department of Defence funding, 2021–22	
Funding:	$43.561 billion
Key cost categories, 2021–22[a]	
Acquisition:	$15.8 billion (35%)
Defence workforce:	$13.9 billion (31%)
Operating (incl. sustainment):	$14.9 billion (34%)

Last year, defence funding hit 2.04% of GDP, meeting the government's promise to restore the defence budget to 2% of GDP by 2020–21. This year, it's projected to reach 2.09%. Both of those numbers are smaller than predicted a year ago, as GDP has recovered faster than expected. It's a salutary lesson on why we shouldn't obsess too much about small changes in percentages of GDP.

Last year's Budget planned a substantial $3 billion or 27% increase to Defence's acquisition spending. That was always going to be challenging in the middle of a pandemic that was disrupting global supply chains. During the year, the government and Defence reprioritised spending, both as a Covid-19 stimulus and to keep projects moving, but in the end the acquisition program ended up around $1 billion short, once we take exchange rate adjustments into account.

Despite that, the military equipment, facilities and ICT acquisition programs all set records for spending. Overall, it was a 13% increase on the previous year. That's quite an achievement in the middle of a pandemic. It's a very encouraging sign that industry can meet the challenge of 'eating the elephant' presented by the DSU's growing acquisition program. Australian defence industry did particularly well, according to Defence's data. Defence's local military equipment spend grew by a remarkable 35% to around $3.5 billion. Australian industry isn't just growing in absolute terms: there are also signs that it's growing in relative terms compared to the share of spending going overseas. If that continues, it's evidence at the macro level that the government's defence industry policy is delivering.

There's another $3 billion increase in acquisition spending planned for this year. If the recovery from Covid-19 continues, Defence and industry could come close to achieving it.

The sustained spending is delivering capability. At the end of last year, the F-35A reached the key milestone of initial operational capability. It will reach its full capability in late 2023 after a 21-year journey starting in 2002. The air warfare destroyer project will also reach full capability very soon. There are substantial upgrades to Defence's facilities occurring around the country.

The Naval Shipbuilding Program is aiming to spend $2.5 billion this year, and its biggest element, the Attack-class submarine project, is looking to hit $1 billion for the first time. The Naval Shipbuilding Enterprise will most likely reach $4 billion in annual spend by the time the submarine and future frigate programs are into

construction. But that also means that those projects will have spent tens of billions of dollars between them by the time the first submarine and frigate are operational.

The government's recent announcement that it will accelerate the establishment of a domestic guided weapons manufacturing capability in Australia was big news. With $100 billion in investment in guided weapons planned and the policy and industrial fundamentals for local production in place, there are good prospects for a huge leap forward for military and industrial capability and the mitigation of supply-chain risks. Getting it right is important, but Defence should also start quickly with some low-risk projects to produce existing types of weapons.

But fundamental problems remain in Defence's capability acquisition system. Earlier this year, Defence cancelled its project to deliver the Submarine Escape Rescue and Abandonment System. After getting into contract and spending what could be close to $100 million, Defence decided that it had irreconcilable differences with its industry partner.

The Army's highest priority program, the digitisation of the Army under LAND 200, also has been put on hold after nearly 15 years of work and almost $2 billion spent. Even if it continues, it could take another 10 years to complete—in total, that's longer than the F-35A. Can Defence keep running projects that take a quarter of a century to deliver?

Defence's external workforce is now its biggest 'service', ahead of the Army. And there's a looming iceberg in there. Defence's acquisition and sustainment budgets are planned to double over the decade. Local acquisition spending alone could grow from $2.6 billion to around $10 billion. Defence will need a much larger workforce to run those activities, but its own workforce is capped, so it's increasingly having to turn to contractors. There's very little data available on what individual contractors cost, but it could be well over twice the average cost of public servants. Collectively, it could cost $1 billion more than an equivalent number of public servants today.

While Defence's top-level budget breakdown shows that the cost of its workforce is declining as a share of the overall budget, that's potentially misleading; the costs of growing numbers of contractors show up not in Defence's personnel budget but in its acquisition and sustainment budgets. It's hard to tell, but it's possible that over 10% of Defence's acquisition budget is going to contractors helping to run projects. Overall, the cost of contractors could explode and eat deeply into Defence's acquisition budget. Defence needs to fully understand the value-for-money case for using contractors—and it needs to share that with the Australian Parliament.

While there are significant questions about how efficiently Defence is spending, there are even bigger questions about whether it's spending it on the right things in the first place.

We noted last year the fundamental disconnect between the strategic assessments in the DSU and the capabilities presented in the supporting Force Structure Plan. The DSU emphasised the need for long-range strike capabilities that can impose cost on and deter a great-power adversary at distance. Yet the ADF's strike cupboard is bare, and there's no clear path to restock it quickly. Moreover, huge investment is planned in capabilities that appear to have minimal deterrent effect on a great-power adversary, such as up to $40 billion on heavy armoured vehicles.

Overall, the force structure and timelines for delivery are holdovers from previous strategic planning documents developed in circumstances that bear little resemblance to our current one. Fundamental changes to concepts and force structure, such as making greater use of uncrewed and autonomous systems, are occurring only slowly. The vast bulk of investment is still going into small numbers of exquisitely capable yet extremely expensive crewed platforms that take years, even decades, to design and manufacture and are potentially too valuable to lose. Defence needs to take more risk and invest more than half of one percent of its budget in in R&D, particularly in distributed, autonomous technologies.

The government has delivered the steadily increasing funding it promised at the start of 2016. That's commendable, considering the economic impact of Covid-19. However, in the DSU, it also acknowledged that Australia's strategic circumstances have deteriorated since 2016—yet Defence's funding model hasn't changed since then.

More funding is needed, but Defence will need to show that it can use it well to deliver capability rapidly. Over the decade, the government is providing $575 billion in funding to Defence, but in that time it won't deliver a single new combat vessel. In short, Defence will need to demonstrate that it has absorbed and is acting with the sense of urgency presented in the DSU.

A final note that shows that part of the DSU's intent is being realised. The DSU directed Defence to focus on our immediate region. As consequence, operations in the Middle East are drawing down and spending on operations is now at its lowest level since before the ADF deployed to Timor Leste in 1999.

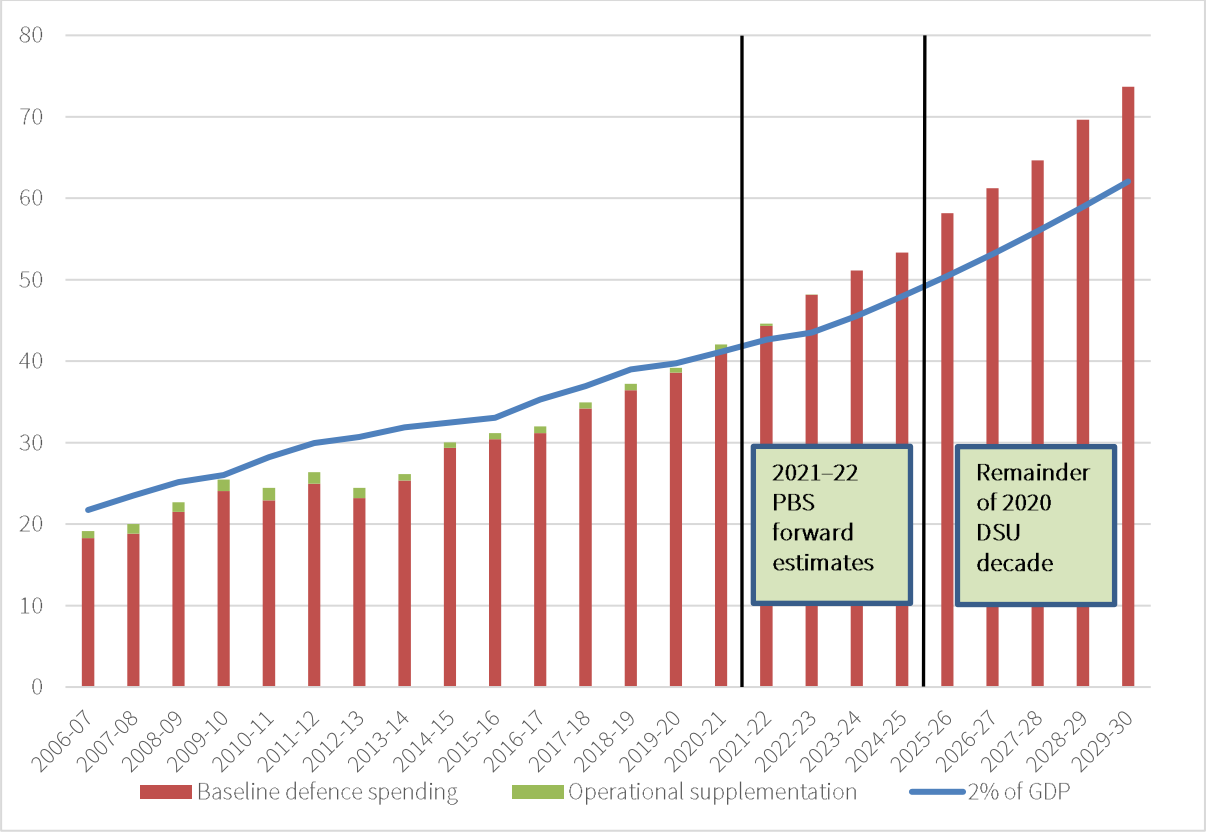
a The key cost categories sum to $44,568.0 million, which doesn't match the Department of Defence's funding appropriation of $43,560.7 million because the key cost categories in the PBS (Table 4b) also include funding from other sources.

Defence in 10 tables

The tables presented here are discussed further in later chapters, so we won't provide detailed analysis here, but we have noted where the material illustrated in the tables is discussed in more detail in this brief.

Defence spending

Figure A.1: The Australian defence budget 2006–07 to 2029–30 (nominal A$ billion) (see Chapter 2)

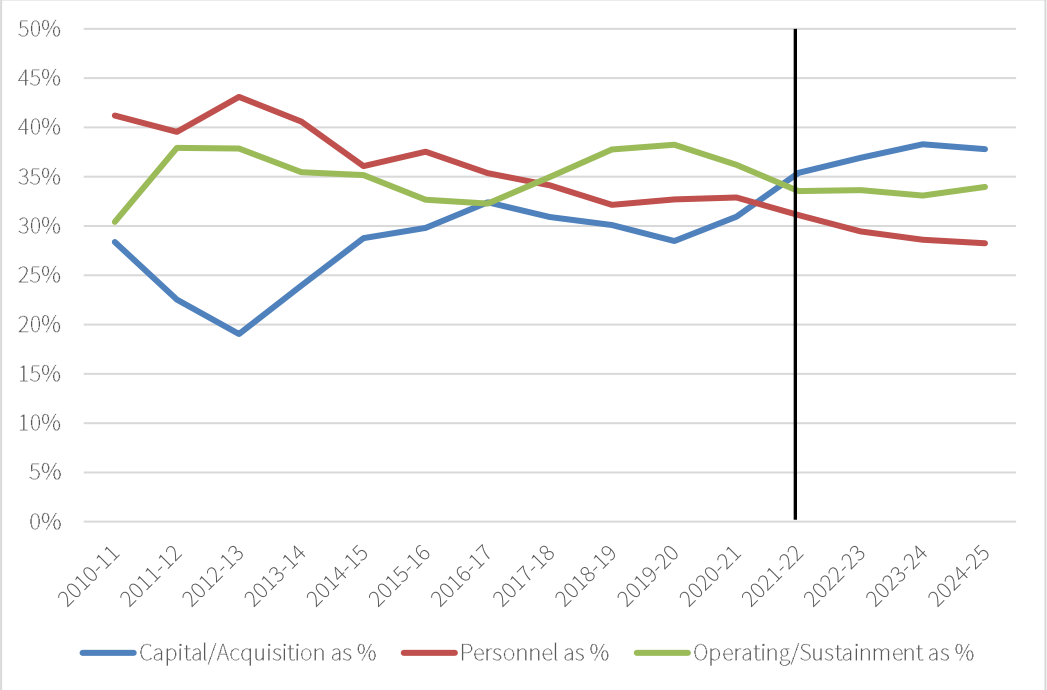


Sources:

Defence funding line: Historical defence spending is taken from ASPI's Cost of Defence database, derived from the PBS. Funding for the forward estimates is taken from the 2021–22 PBS. Funding after 2024–25 is taken from the 2020 Defence Strategic Update.

2% of GDP line: Historical data on GDP is taken from the Australian Bureau of Statistics. Estimates for GDP over the forward estimates are taken from 2021–22 Budget paper no. 1. We have generated estimates for GDP beyond the forward estimates by projecting 5.3% nominal GDP growth.

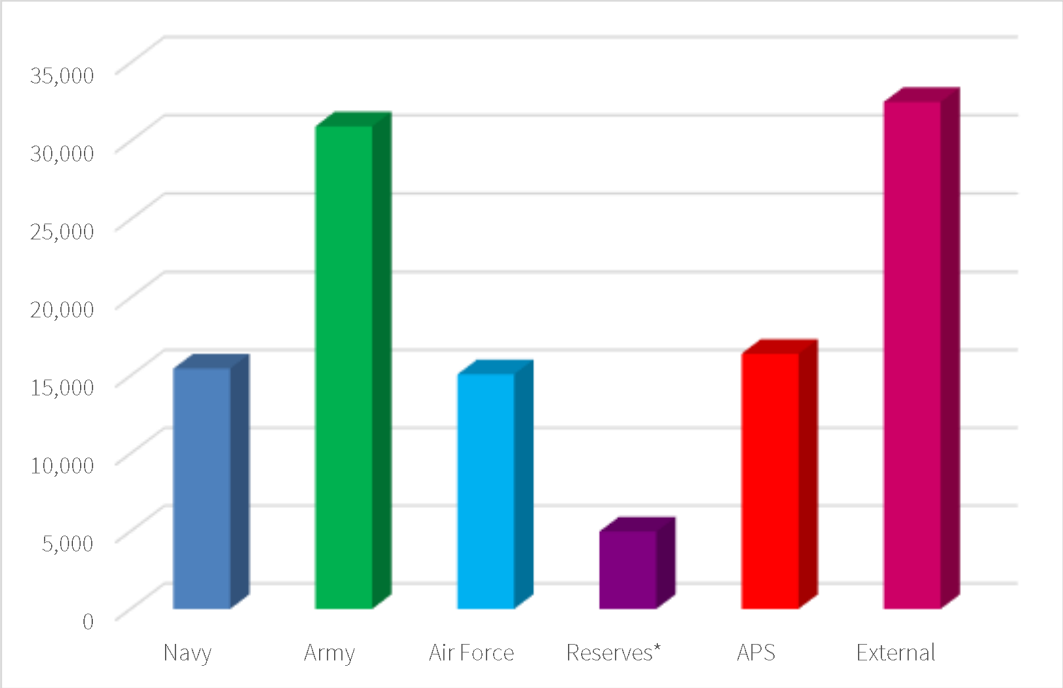
Figure A.2: The Big 3—the balance of the defence budget, 2010–11 to 2024-25 (%) (see chapters 2 and 3)



Source: PBS 2021–22 for 2020–21 onwards; PBS and PAES for earlier years.

Defence workforce

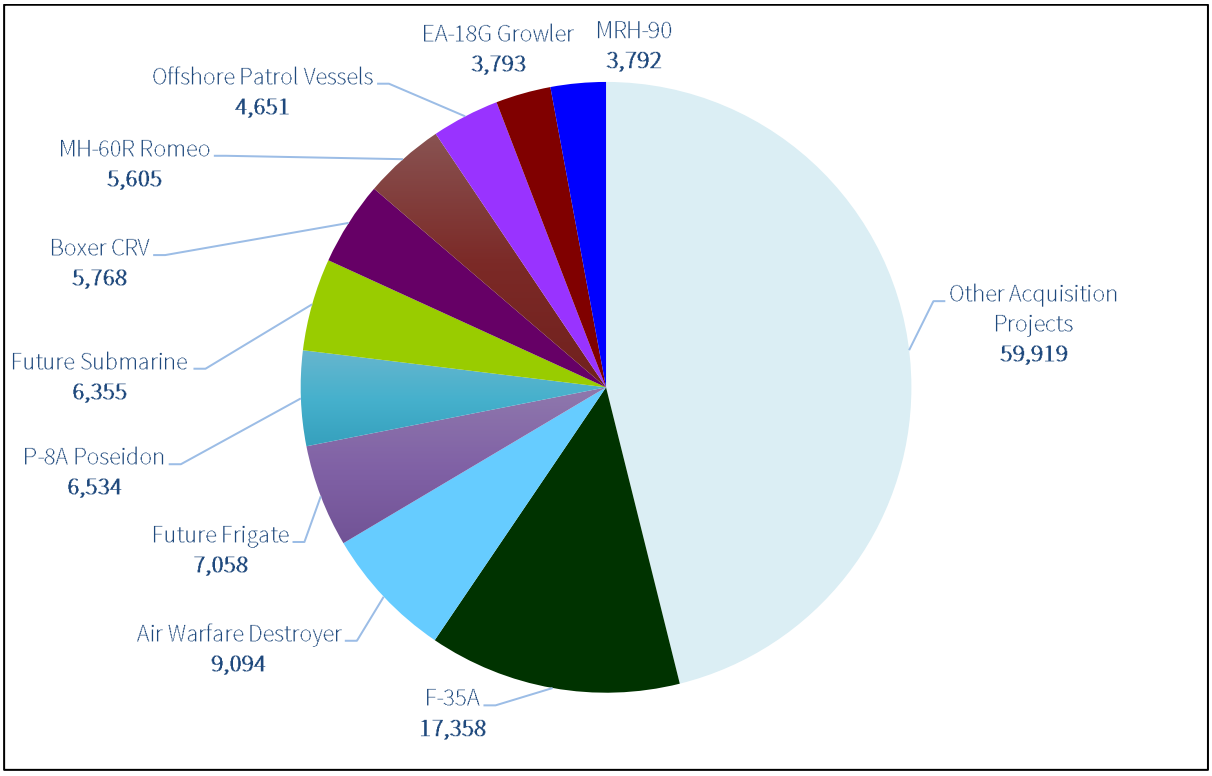
Figure A.3: 2021–22 Defence personnel, by full-time equivalent (see chapters 2, 3 and 5)



** Reserve FTE calculated by ASPI by dividing allocated workforce days by 220.*

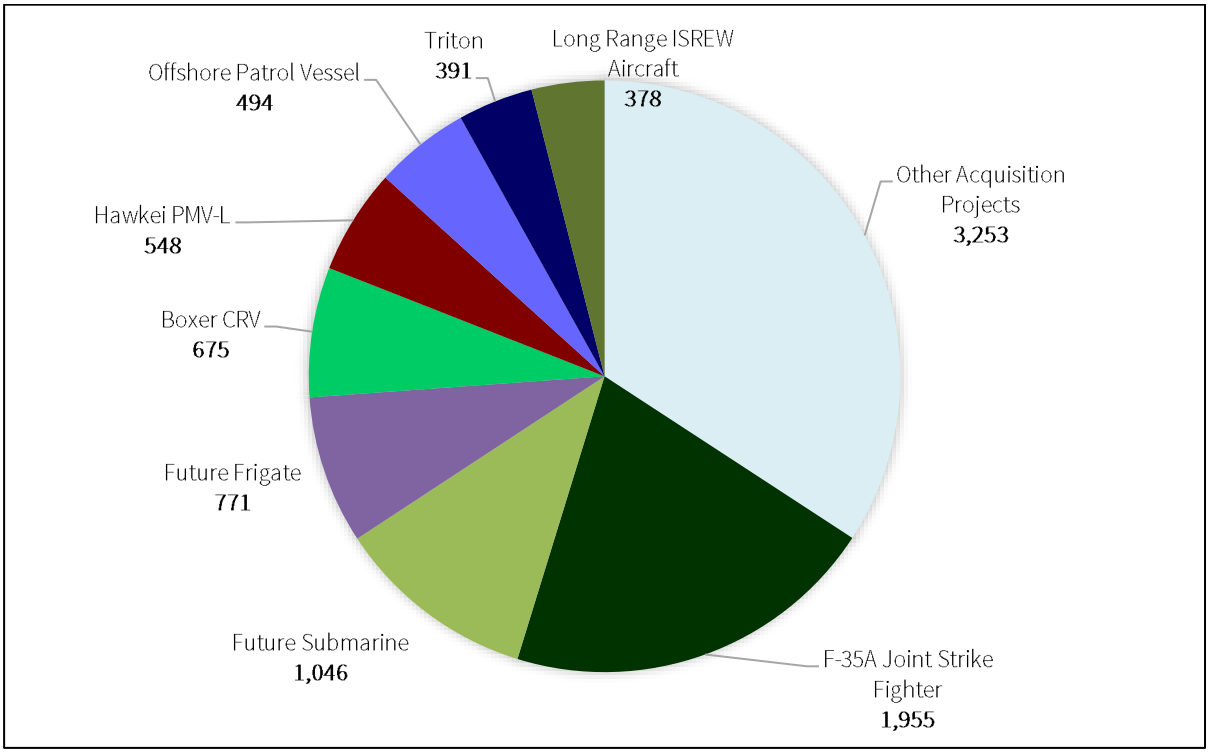
Source: ADF and APS numbers are from 2021-22 PBS allocation. External workforce is from March 2021 Defence external workforce census supplied by Defence.

Figure A.4: Top 10 acquisition projects, 2021–22, by total approved project budget (A$ million) (see chapters 3 and 4)



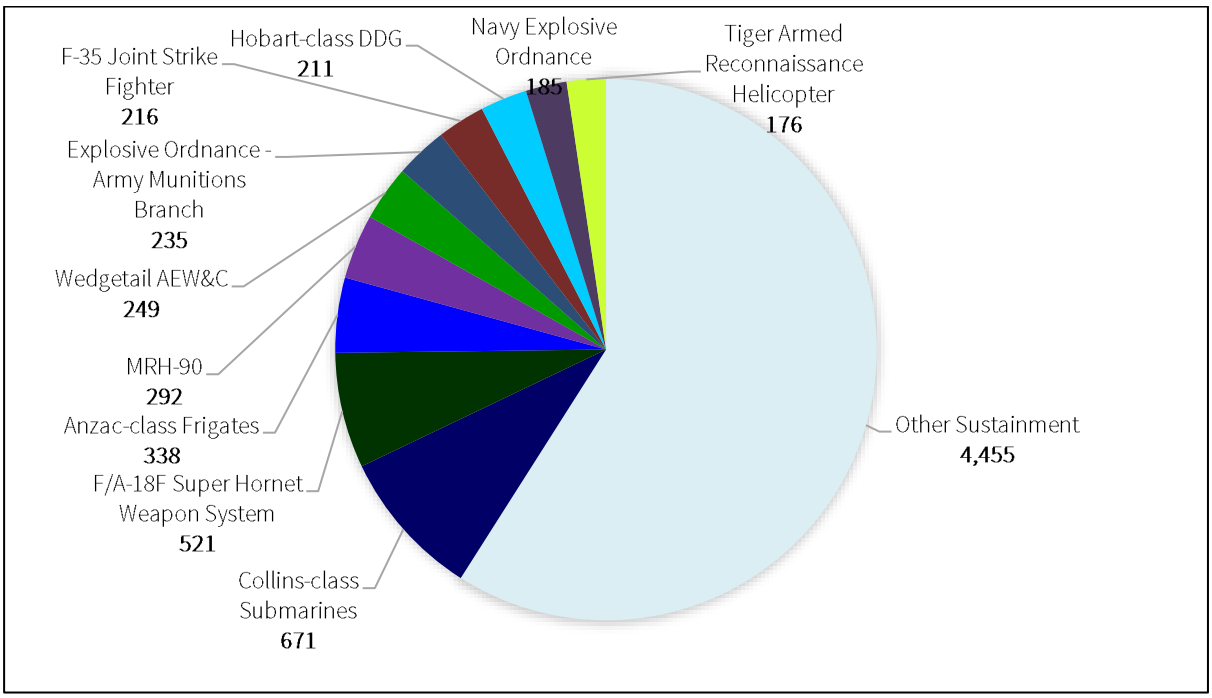
Source: PBS 2021–22, Table 54. Figures include both military equipment and other project inputs to capability.

Figure A.5: Top 10 acquisition projects, by planned 2021–22 spend (A$ million) (see chapters 3 and 4)



Source: PBS 2021–22, Table 54. Figures include both military equipment and other project inputs to capability.

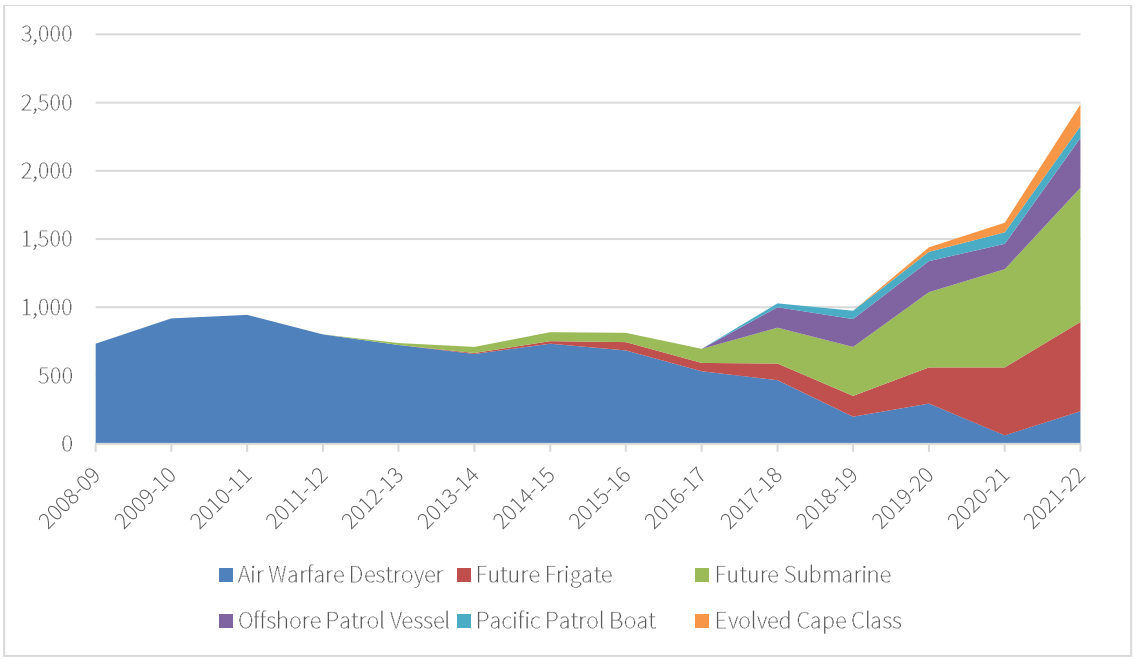
Figure A.6: Top 10 sustainment products, by planned 2021–22 spend (A$ million) (see chapters 3 and 4)



Source: PBS 2021–22, Table 55.

The cost of shipbuilding

Figure A.7: Naval Shipbuilding Plan cash flow, 2008–09 to 2021–22 (nominal A$ million) (see Chapter 3)

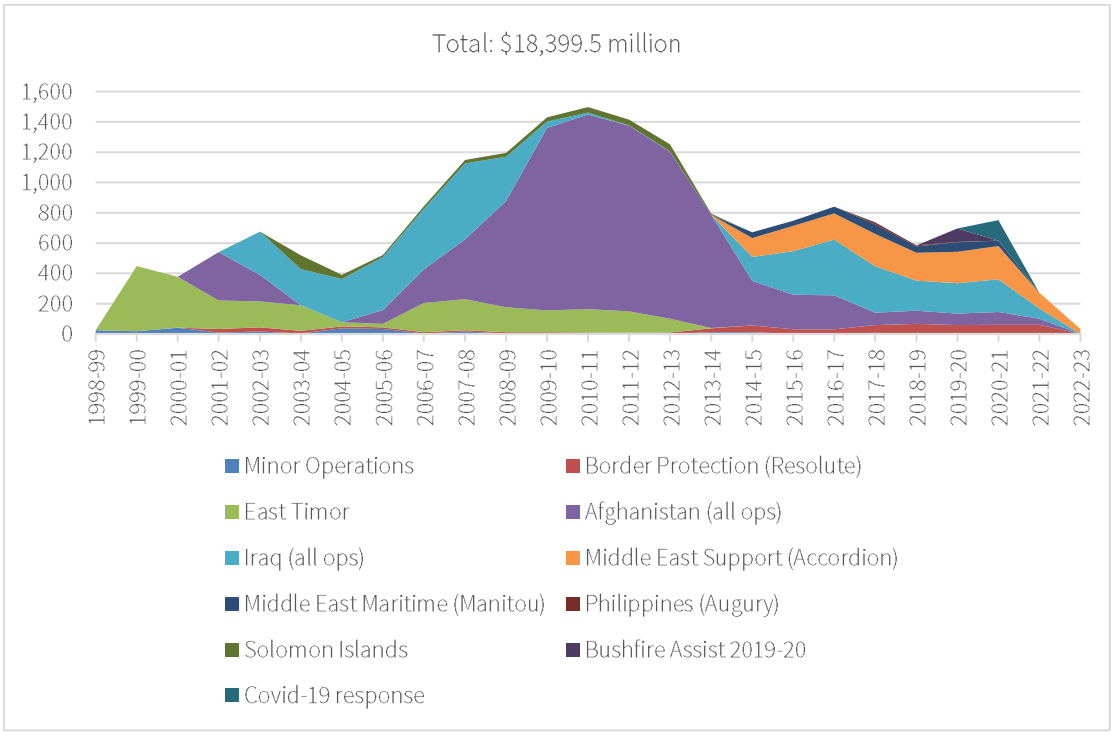


Notes: To ensure consistency with years before 2021–22, this table does not include other project inputs to capability. The Pacific Patrol Boat is no longer in the PBS Top 30 acquisition table, so we assume the same cash flow for 2021–22 as 2020–21 ($85 million).

Source: Defence annual reports, PBS.

Operations

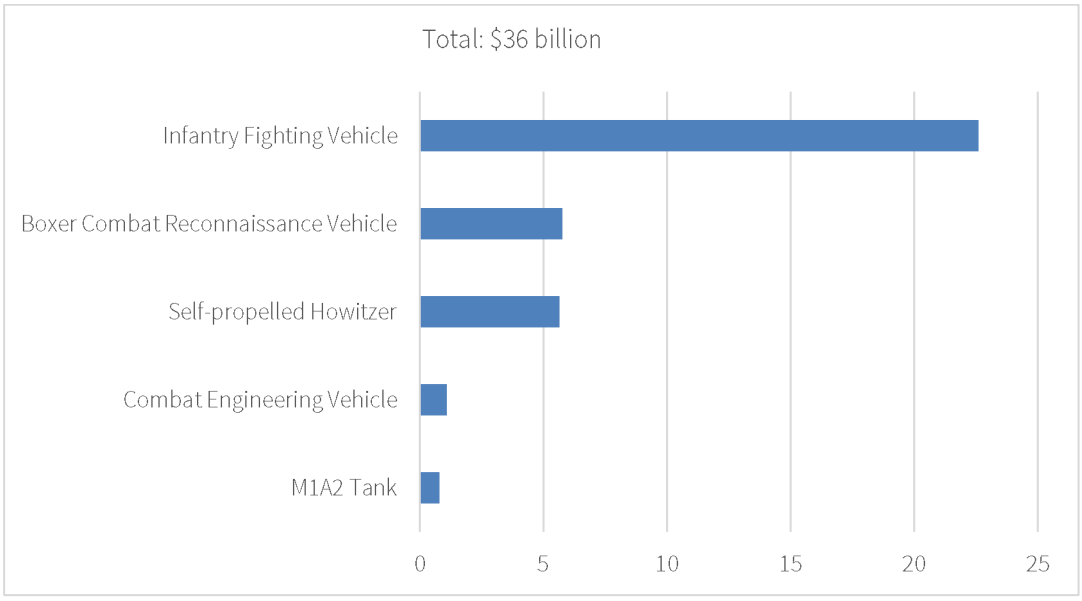
Figure A.8: Operational supplementation, 1998–99 to the present (nominal A$ million) (see Chapter 3)



Sources: Defence annual reports, PBS.

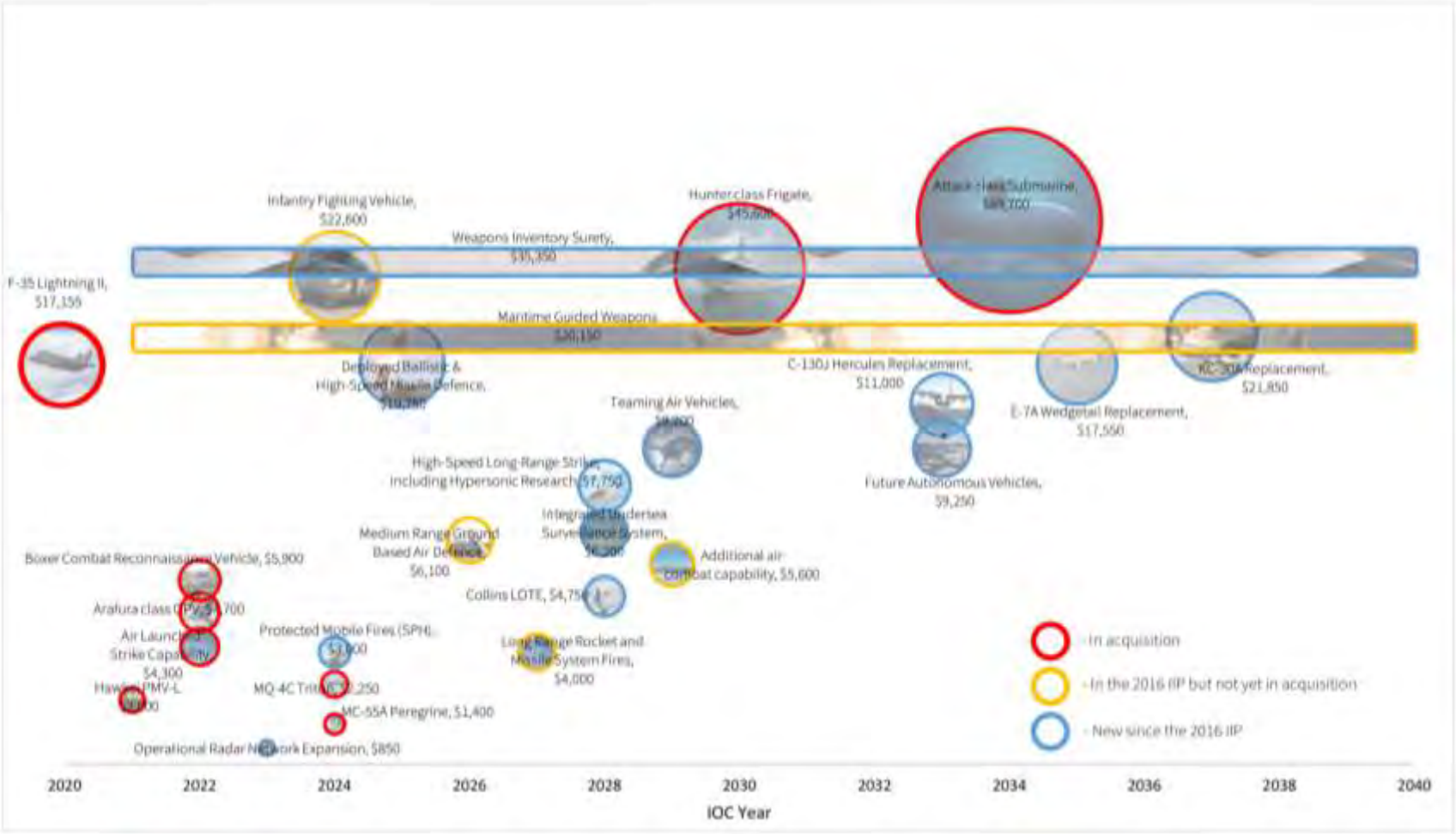
The 2020 Defence Strategic Update and Force Structure Plan

Figure A.9: Defence's armoured vehicle projects (nominal A$ billion) (see Chapter 5)



Note: Budgets are derived from the mid-point of the FSP bands. Boxer is the approved acquisition budget.

Figure A.10: Schedule of significant defence capability investments by initial operating capability (bubbles sized by mid-point of FSP budget band (A$ million) (See chapters 4 and 5)



Sources: Schedules are ASPI estimates from FSP investment charts, or from ANAO, Major projects report where they are included. Budgets from middle of FSP band, or from Defence PBS where they are included. Figure prepared with the assistance of Albert Zhang.

Chapter 1: The context

Key points

- China's coercive behaviour continues. However, in a textbook form of balancing, regional countries are cooperating with each other to push back.
- China's economic coercion isn't having the intended effect on Australia. Rather, it's demonstrating the resilience of well-managed economies.
- The Australian economy, like much of the world's, is recovering more quickly from the Covid-19 recession than most people expected. The government appears to be comfortable to continue deficit spending on priorities that are important to it.
- As always, defence ranks low among Australians' concerns, but there's growing mistrust of China, while support for the alliance with the US remains strong.

1.1 The strategic context

The Defence Strategic update—calling a spade a spade

On 1 July last year, the government released its Defence Strategic Update (DSU). Like all strategic policy documents Australia has released over the past two decades, the DSU made the usual observations that things had changed faster than we had anticipated. It says that the 2016 Defence White Paper (DWP) basically got things right but didn't quite foresee the pace of change. That's only half right. The 2016 DWP probably didn't get things broadly right. In fact, the DSU overturns many of the assumptions built into the 2016 DWP and Australian strategic thinking more broadly. It now calls things as they are, rather than clinging to fantasies about China becoming a normal member of the rules-based global order or US power remaining unchallenged for decades to come, so the DSU is good policy foundation to build upon. Of course, because those ways of thinking are so baked into much of Australia's defence and strategy establishment, the full implications of the DSU's assessments—in particular the need for urgency—haven't completely filtered through Defence or the commentariat.

Chinese aggression

We continue see growing Chinese aggression. It's more than 'wolf warrior' diplomacy. China's snuffing out of Hong Kong's limited autonomy has also snuffed out any prospect of Taiwan voluntarily reuniting with the mainland. But Xi Jinping has made very clear his willingness to resolve the Taiwan issue by force. While some commentators have said that Chinese action is not imminent, it's hard to imagine how the Chinese Communist Party (CCP) could do any more signalling of its intent short of sending an email with the exact time and place of an amphibious landing.[1] The DSU certainly is right in saying that we can no longer rely on 10 years of warning time. Hindsight is 20/20, but our warning time clock started counting down over 10 years ago.

We've lost our edge

The balance of military power continues to shift. China used asymmetric concepts and technologies to create its anti-access/area denial capability and won a bloodless victory over the US, pushing its aircraft carriers and their

massive sunk cost so far offshore that they can't intervene in conflict in the Western Pacific. Now China is shifting its focus to overmatching the US in conventional military power. China is simply outbuilding the US and its allies. Australia is falling further behind the 'industry standard' of military capability. This is one of those areas where the DSU's assessments haven't filtered through Defence's thinking. If vertical launch cells are the currency of naval power, we're spending ourselves into capability bankruptcy. China is building destroyers with 112 vertical launch cells. That's two and half times more than those on our three destroyers, three and a half times as many as on our new frigates, which won't commence operational service for a decade, and 14 times more than those on our current frigates, some of which will be in service until the 2040s.

Meanwhile, modern precision weapons continue to proliferate globally and in our region. That was demonstrated most forcefully last year in Azerbaijan's stunning and complete victory over Armenia, which was achieved through the use of off-the-shelf drones and guided weapons. While we're used to seeing that capability demonstrated by major powers such as the US, Azerbaijan's GDP is 3.1% of Australia's. If Azerbaijan can master the technologies and techniques of precision strike, any state that wants to can. And we're seeing also that non-state actors can, too. Australia is still years from having armed drones.

It's time for us to start thinking asymmetrically, rather than thinking that we can rely on an overwhelming advantage in conventional technology over any adversary. We're starting to see some glimmers of that kind of thinking in the DSU, but so far it's hard to see it permeating the Defence organisation.

The US is getting its mojo back

On a more positive note, the US is engaging more constructively with the region. President Biden is not a re-run of the Obama administration in his administration's approach China. The new administration is continuing the previous one's approach in being tough on China. Those who feared that Biden might carry on where the Obama administration left off, as if the intervening four years of increasingly bad Chinese behaviour hadn't happened, can breathe a sigh of relief.

Certainly, Biden isn't increasing the US defence budget, but competing with China isn't something the US can simply spend its way out of through more military equipment. Biden's draft budget sent to Congress in April states that 'America is confronting four compounding crises of unprecedented scope and scale all at the same time.' It's a useful reminder of Biden's priorities that China's increasing power and aggression aren't one of the four; rather, the four named crises are the Covid-19 pandemic, the resulting economic crisis, a 'national reckoning on racial inequality centuries in the making', and climate change. Competition with China is mentioned, but Biden makes clear that it isn't simply or even mainly a military problem. Instead, he seeks to outcompete China through 'a comprehensive strategy to reimagine and rebuild a new American economy'.[2]

Biden's first priority is rebuilding America's economic and technological base. If that works, military power will follow. Moreover, Biden is engaging much more constructively with allies and partners in the region. However, that engagement is built on an assumption that the allies will do more for themselves.

That, however, aligns with their own thinking. Whether it's Japan loosening the 1% of GDP constraint on its defence spending, the US and South Korea removing constraints on the latter's missile development, or Australia accelerating its own domestic missile manufacture, US allies appear to be energised by the US's renewed commitment.[3]

In Australia's case, the alliance seems as strong as ever. The mutual commitment continued under the previous administration, but it seemed to be sustained by a sense of habit, or by the longstanding person-to-person contacts of people across the national security community, rather than being driven from the top. There are many opportunities for Australia to develop our own strategic heft and self-reliance within the alliance, but that

will require commitment, and a Taiwan contingency will present Australia with the ultimate test of our commitment.

Regional balancing in many forms

Across the Indo-Pacific, we're seeing many forms of what political scientists term 'balancing'. In everyday language, that means pushing back. That can take many forms. We aren't the only ones. Those who think Australia is undiplomatic should see the Philippines Foreign Minister's forthright comments provoked by China's behaviour in the South China Sea..[4]

One of the most striking examples of balancing is the Quadrilateral Security Dialogue (aka the Quad) between Australia, India, Japan and the US. It's got a long way to go, and anybody who thinks it will produce a NATO-style alliance is dreaming, but that's not its point. It's creating conversations and cooperation, for example on critical and emerging technologies.[5] The fact that India, which has long seen itself a beacon of non-alignment, is enthusiastically participating shows how much China's aggression has forced rethinking across the region.

We're also seeing greater cooperation in the form of military exercises in new and probably unforeseen mixes of partners. The fact that both France and the UK have sent the core of their navies to the Indo-Pacific shows that Europe, too, now realises that the Indo-Pacific is now the main game, and pushing back on bad behaviour is something that all democracies need to do. They might not all do it in the same way or to the same extent, but the fundamental realisation that a global order fashioned according to the CCP's preferences isn't in everyone else's best interests is generating balancing behaviours around the world.

That doesn't mean that collectively we have worked out the best ways to resist the CCP's coercive behaviour. Xi Jinping's risk taking, whether it be in its *de facto* annexation of the South China Sea against the ruling of an international tribunal, its elimination of Hong Kong residents' freedoms, its persecution of Uyghurs, and so on, has largely paid off, so far. But the world is starting to push back.

1.2 The economic context

Chinese economic coercion and Australia

There are signs that China's coercion is no longer working. Its economic coercion of Australia isn't paying off for it. Let's put aside the ridiculous commentary that somehow Australia brought this upon itself by being undiplomatic. The entire international trade order is built upon principles and structures that stop countries using trade as a coercive tool. You don't get to put embargoes on another country just because you feel it hurt your feelings.[6] Disagreeing civilly is part of being a mature, responsible country. You do get to impose embargoes as sanctions in the face of a real security threat. Since the CCP sees any criticism as a threat to its self-assigned right to rule, it therefore sees embargoes (even ones not declared as such) to be valid responses to criticism of its behaviour.

But are the embargoes and import tariff hikes having any real effect on Australia? So far, they don't seem to be having any effect on the broader Australian economy.[7] In fact, despite the Chinese boycott, there's a push for more coalmines here. To date, the CCP's embargoes have had a much greater effect on China's citizens and consumers, who shivered through winter while Australian coal sat in ships unable to be unloaded or were turned away.[8] There's the possibility that China might choose the 'nuclear option' and ban imports of Australian iron ore (currently our biggest export earner), but that would definitely hurt China too, as there are no viable alternative sources, and there won't be for some time.[9]

Arguably ,China's embargoes have done as much as Covid-19 to make Australia's governments and people aware of supply-chain risks and the need to diversify Australia's trade, by both sectors and markets. Of course, diversification has always been the Holy Grail, but Australia was able to be the lucky country by virtue of our resource exports for so long that there was little real motivation to pursue diversification. That's slowly changing, for example in the government's Defence industry policy and more recently in its Modern Manufacturing Initiative. It's going to take time and commitment. Data from the Reserve Bank of Australia suggests that Australian companies aren't addressing supply risks to the extent one might have expected after the experiences of Covid-19 and Chinese coercion.[10]

But perhaps the biggest lesson out of China's attempted economic coercion of Australia is that well-run states and economies are resilient. The rest of the world can see that, too, and is learning that pushing back on Chinese coercion doesn't mean your economy will collapse.

Moreover, we're also relearning that resilience is as much psychological as it is about money, military equipment or critical infrastructure. And Australia is demonstrating its psychological resilience in the face of Chinese coercion. If we're going to buckle at the hint of reduced exports, then it doesn't matter how much we invest in defence capability.

The recovery from Covid-19

It may not be 'gas led', as the government hoped, but Australia's recovery from the Covid-19-induced downturn is happening faster than anyone could have predicted. The Reserve Bank stated in May that 'The Australian economy is transitioning from recovery to expansion phase earlier and with more momentum than anticipated. The unique features of the pandemic and policy response have seen the economy rebound much faster than in previous downturns.'[11] GDP has grown faster and unemployment has fallen faster than expected and is likely to fall even further. The assessment of international organisations such as the World Bank is similar.

At $2,132 billion, the government's prediction for GDP in 2021–22 is substantially higher in this year's Budget papers than the figure of $1,947 billion predicted a year ago.[12] As Table 1.1 shows, the rapid recovery means that the deficit predicted for 2020–21 of $213.7 billion (11% of GDP) has come in lower at $161 billion (7.8%). The deficit predicted for 2021–22 has also come down a little. The numbers are still very large, of course.

Table 1.1: Forecast versus actual underlying cash surplus/deficit, 2013–14 to 2024–25 federal budgets ($ billion, nominal)

		2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
2013–14	$b cash	−18.0	−10.9	0.8	6.6								
	% GDP	−1.1	−0.6	0.0	0.4								
2014–15	$b cash	−49.9	−29.8	−17.1	−10.6	−2.8							
	% GDP	−3.1	−1.8	−1.0	−0.6	−0.2							
2015–16	$b cash	−48.5	−41.1	−35.1	−25.8	−14.4	−6.9						
	% GDP	−3.1	−2.6	−2.1	−1.5	−0.8	−0.4						
2016–17	$b cash		−37.9	−39.9	−37.1	−26.1	−15.4	−6.0					
	% GDP		−2.4	−2.4	−2.2	−1.4	−0.8	−0.3					
2017–18	$b cash			−39.6	−37.6	−29.4	−21.4	−2.5	7.4				
	% GDP			−2.4	−2.1	−1.6	−1.1	−0.1	0.4				
2018–19	$b cash				−33.2	−18.2	−14.5	2.2	11.0	16.6			
	% GDP				−1.9	−1.0	−0.8	0.1	0.5	0.8			
2019–20	$b cash					-10.1	-4.2	7.1	11.0	17.8	9.2		
	% GDP					-0.5	-0.2	0.4	0.5	0.8	0.4		
2020–21	$b cash							-85.3	-213.7	-112.0	-87.9	-66.9	
	% GDP							-4.3	-11.0	-5.6	-4.2	-3.0	
2021–22	$b cash								-161.0	-106.6	-99.3	-79.5	-57.0
	% GDP								-7.8	-5.0	-4.6	-3.5	-2.4

Budget year estimate	Forward estimates	Actual achievement

Source: Department of Treasury, Budget paper no. 1.

The global picture

There's also broad consensus on the recovery at the global level. In short, it's occurring faster than most observers expected, and the world is far from their gloomiest predicted scenarios. The global economy will pass pre-pandemic levels of activity fairly quickly, but it won't make up for lost ground for some time. The recovery will vary. Not surprisingly, countries that managed the pandemic well will recover fastest. Among the developed economies, the US will have the highest growth rates in 2021 (a very robust 6.4%, according to the International Monetary Fund). China will likely do even better (8.4%). Predictions for even higher growth for India are likely to be revised downwards in the light of the resurgence of the pandemic there.[13]

Overall, the pandemic has been a significant blip, causing pain but not fundamentally changing the relative stature of the global players. However, stimulus spending, particularly by the US, is creating concerns about inflation and potential future crises that inflation could cause.[14]

Changed settings

The Covid-19 experience seems to have made conservative governments much more comfortable with some concepts that were once anathema to them. Take deficits, for example. Just as there are no atheists in the trenches, there are no fiscal conservatives in the middle of a recession. But the government is continuing to prime the pump even with the immediate crisis past us. The Budget papers' predicted deficits for this year and

the last may have come down, but they extend further into the future and decrease more slowly than was the case a year ago. In short, the government seems to be happy to not take the shortest path back to surplus. Most views seem to be that it's going to be a decade-long journey.[15]

The government also seems to have shed the view that reducing unemployment below 5% will lead to rampant inflation and is aiming for a lower target. If getting there involves more public spending, it seems happy to do that too. If it's concerned about spending causing inflation (one of the perennial bugbears of conservative economic principles), it isn't showing it. This isn't a government that's holding dear to ideological commitments to economic rationalist principles. One suspects that, if the car industry had managed to hold on for a few more years, there would a different view in Canberra on the value of supporting it.

The overall impression is that the government has become more comfortable spending on things that are important to it, even if that creates deficits. Those priorities seem to include national security. The depths of the pandemic in mid-2020 offered the government a golden opportunity to walk away from its 2016 DWP funding commitments. It didn't and instead reaffirmed and extended those commitments. It's hard to see this government walking away from those commitments as the economy improves.

A strange view of our economy

Some have expressed scepticism about the prospects for our economy, in particular the prospects for a revival of manufacturing. In some ways, it's legitimate to do that. The concept of a 'gas-led' recovery is a particularly strange one. Aside from the improbability of gas producing significantly cheaper electricity, energy costs are only one small input into manufacturing.[16] Other than a few sectors that are heavily dependent on electricity, such as aluminium smelting, the viability of manufacturing isn't determined by the price of electricity, but by the supply of things such as a skilled workforce, capital, intellectual property and innovative vision.

What's particularly frustrating is the way in which some appeal to the Atlas of Economic Complexity (AEC) to write off the prospects for manufacturing in Australia. The AEC, which is based at Harvard University, ranks countries by economic complexity. According to its self-description:

> [T]he Atlas is a research and data visualization tool that allows people to learn more about the economic structure of their country, including the growth opportunities that exist in the latent productive capabilities a country has. The Atlas puts the capabilities and know-how of a country at the heart of its growth prospects, where the diversity and complexity of existing capabilities heavily influence how growth happens.[17]

Australia ranks low. Currently, we're ranked 87th, just ahead of Burkina Faso, Paraguay and Cambodia, and just behind Uganda, Mali and Botswana. Based on this, some have argued the Australian economy doesn't have the necessary skills to develop advanced manufacturing.

I won't write out the long list of all the technologically advanced things that Australia has designed, manufactured and exported. Certainly, manufacturing for export in Australia can be challenging. The success of our minerals exports has created a permanent case of 'Dutch disease', inflating the Australian dollar and making it difficult for other export industries to be internationally competitive. But the AEC seems to think that, because those minerals make up such a large part of our exports, they reduce our economic complexity.

However, those mineral and other primary production exports are generated by extremely technologically advanced capabilities. For example, Australian mining relies on high degrees of automation generated by Australian industry. The manufacturing sector supplying the mining industry provides substantial latent capability for other sectors. A good example of this is the seamless sideways move of Civmec, which does heavy engineering for the oil, gas and minerals sectors, into naval shipbuilding.

Certainly, the government's latest policies to support advanced manufacturing might not succeed, but that won't be because of imagined structural similarities between our economy and Mali's. It probably would have helped if we still had a car industry, though.

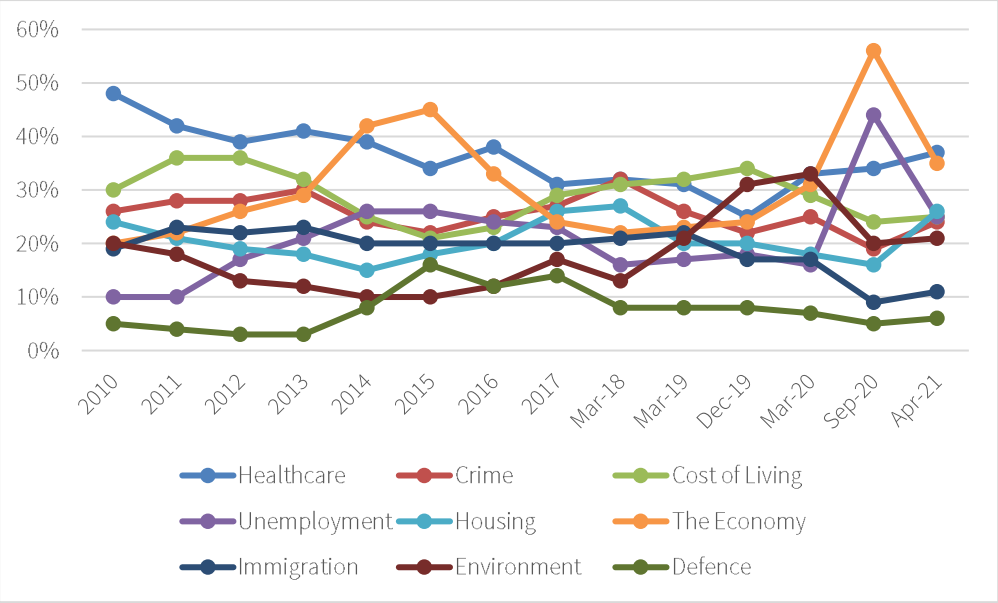
1.3 Public opinion

There's a well-established phenomenon in Australian public opinion on national security issues. It's this: when Australians are polled specifically about national security issues, they can have very strong views about particular countries or potential threats. However, when asked to rank all of their concerns, defence ranks very low.

Defence ranks low, as always

The *Ipsos Issue Monitor* has tracked the 'big issues' consistently for a decade (Figure 1.1). Over that period, defence has consistently been among Australians' least concerns, well behind economic and quality-of-life concerns. The ranking of particular issues can change; during the pandemic, it wasn't surprising that concerns about health care, unemployment and the economy in general rose. The current spike in housing prices has also registered in respondents' answers. But defence rarely rises above being a concern for more than 10% of the population (and those polled get to nominate three issues). Currently, it's at 6%, sitting behind petrol prices.

Figure 1.1: The big issues, 2010 to 2021



Note: Figure does not include all categories.
Source: Ipsos Issues Monitor, online.

Growing concern about China

But Australians do have opinions on national security issues. The Lowy Institute's poll is the most detailed, consistent and rigorous on national security. Its most recent edition was published in June 2020 at the peak of the pandemic in Australia.[18]

Growing numbers of Australians see China as a security threat, increasing from only 12% in 2018 to 41% in 2020. However, more continue to see China as an economic partner than as a threat (55%), although that's fallen

sharply from 82% in 2018. Trust in China to act responsibly in the world was falling sharply even before Covid-19. Only 23% trusted China 'a great deal' or 'somewhat', down from 54% in 2017.

Seventy-eight per cent of Australians considered our alliance relationship with the US to be either 'very important' or 'fairly important'. That's consistent with the long-term average of 77.4% over 16 years of polling.[19] However, only 40% agreed with supporting US military action in the Middle East. Moreover, according to the poll, 'even fewer Australians (34%) agree with Australian support for 'military action in Asia, for example, in a conflict between China and Taiwan'. That may have reflected very low levels of confidence that President Trump would do the right thing in world affairs (total of 'some' or 'a lot' of confidence on that score: 30%), but confidence in President Xi Jinping was even lower at 23%.

In short, Australians have growing concern about China, but not a lot of interest in fighting a war with it. That gets to the heart of the dilemma posed by a Taiwan contingency for the government. Australians support the alliance, but the US is likely to seek Australian contributions to the defence of Taiwan. If Australia doesn't help the US defend a democracy of around 25,000,000 people in the Western Pacific, what right do we have to expect the US to defend a democracy of around 25,000,000 in the South Pacific?

Some perspective

If global issues are getting you down, it's useful to keep some perspective. Australia has a high quality of life. We're eighth in the latest Human Development Index from 2019, ahead of any other country in the Indo-Pacific (other than, somewhat ironically, Hong Kong—that might change in the next edition).[20] We're ranked as the 11th happiest country in the world, although our cousins over the Tasman Sea just pip us there for the happiest people in the Indo-Pacific.[21] We also have a long time to enjoy that happiness. Our life expectancy at birth is seventh longest, at 83 years. For those of us getting on a little, it's nice to know that at 60 we can expect another 25.6 years, on average.[22]

While Australians have certainly been affected by the Covid-19 pandemic in many ways, we are to date 156th in the world in terms of Covid-19-caused deaths compared to population, at 35 per million people. That's a list where you want to be near the bottom.[23]

For those of us concerned about global warming and Australia's progress towards a post-carbon economy, there are also some grounds for optimism. Australia's energy market regularly hits 50% renewable supply (granted, that's on sunny days), and the Australian Energy Market Operator assesses that Australia will hit 90% renewable generation before 2040.[24]

Chapter 2: How much money is it?

Key points

- Despite the economic impact of Covid-19, this year's consolidated defence funding (that is, for the Department of Defence and the Australian Signals Directorate) delivers the 2021–22 funding that the government set out in the 2016 DWP and 2020 DSU—no more, no less.
- The consolidated defence appropriation for 2021-22 is $44,618.6 million, representing growth of 6.1% in nominal terms and 4.1% in real terms from the previous financial year.
- At 2.09% of GDP, it's the highest percentage since 1992–93. Based on the Budget papers, defence funding will continue to grow, reaching 2.23% of GDP by the end of the forward estimates.
- Defence missed its spending target in 2020–21 by around $1 billion, due mainly to Covid-19 disrupting the acquisition program.

This chapter provides a high-level analysis of the defence budget.[25] Since the Defence PBS is available online on Defence's website, we avoid reproducing PBS tables here as much as possible.[26] When we're referring to a PBS table (as opposed to one in this brief), we flag that with the prefix 'PBS'. If we don't specify a year or state 'this year', we're referring to 2021–22.

On 1 July 2018, the Australian Signals Directorate (ASD) became a statutory agency within the Defence portfolio. Its funding is now treated separately within the PBS. Because the government's 2016 DWP and 2020 DSU funding lines and its commitment to increase the defence budget to 2% of GDP included ASD, our analysis of total defence funding still includes ASD. We refer to this as 'consolidated' defence funding. The top-level consolidated funding line is presented in PBS Table 4a. Most of our detailed analysis, however, focuses specifically on the Department of Defence.

2.1 The top-level numbers

How did the defence budget end up in 2020–21?

The government had made a longstanding promise to restore defence funding to 2% of GDP by 2020–21. With GDP taking a big hit in the first half of 2020 due to Covid-19, it nearly got there a year early, as defence funding reached 1.97% of GDP in 2019–20. In the end, the government made it on schedule in 2020–21.

In the 2020–21 PBS, the estimated consolidated defence budget for that year was $42,746.0 million. Due to the pandemic's impact on GDP, that was predicted to be 2.19% of GDP.

In the mid-year update to the Budget (the 2020–21 PAES), there was a relatively minor net reduction to the budget. The main components of that were a $287.2 million reduction to adjust for the increasing value of the Australian dollar (maintaining Defence buying power constant in real terms). There was also an additional $55.5 million in supplementation for Operation Covid-19 Assist, bringing the total supplementation for that activity for the year to $136.2 million.

In the end, according to the latest 'estimated actual' figures, defence funding in 2020–21 will reach $42,041.6 million (Table 2.1) by 30 June. That's about $700 million short of the original budget estimate, which

can be accounted for by a $691 million downwards adjustment due to foreign exchange, and adjustments to the amount of supplementation required for operations. It's almost exactly on target.

Since GDP has recovered much faster than virtually anyone could have reasonably expected, that funding turns out to be 2.04% of GDP rather than the predicted 2.19%, even though in real terms it's the same amount of money. It's a salutary lesson in why we shouldn't obsess too much about changes to defence funding as a percentage of GDP. The government promised funding certainty (not a fixed percentage of GDP) and has delivered it.

A $1 billion underspend in 2020–21

We should note a further key point. While the government provided the promised funding, Defence has fallen short in spending it in 2020-21. PBS Table 4a (serial 1) shows government *funding* for Defence. However, PBS Table 4b shows the department's *spending*, which should be a larger number as the department also has other sources of revenue that it can spend. In 2020–21, Defence was aiming to spend $42,612.4 million. According to PBS Table 4b, it will achieve a spend of $40,931.7 million. That's a difference of $1,680.7 million. Again, around $700 million is in adjustments for foreign exchange (that is, Defence didn't need to spend that money to acquire the same amount of capability) and operations mentioned above. The rest is a shortfall of around $1 billion in the acquisition program. We discuss that further below.[27]

What happens to that $1 billion? It doesn't just evaporate (yet). It shows up in the 'appropriations carried forward' line of PBS Table 1 as part of the $1,612.6 million variation in serial 21. Theoretically, these are funds that Defence can still draw on with the government's approval, should it find something it can quickly spend an extra billion on. Those funds are automatically repealed after three years and will no longer be available to be spent.[28] As they're already appropriated, they don't show up in this year's appropriation (serial 5).

What's the total defence appropriation for 2021–22?

The consolidated defence appropriation for 2021 is $44,618.6 million (Table 2.1). Defence ministers used to include that top-level number in their Budget night media release, but for some reason no longer do so. Nevertheless, the number can be easily found in PBS Table 4a.

Table 2.1: Consolidated defence funding from government, 2020–21 and 2021–22 ($ million)

Year	Department of Defence	Australian Signals Directorate	Consolidated total
2020–21 Budget estimate	41,715.1	1,030.9	42,746.0
2020–21 estimated actual	41,031.2	1,010.5	42,041.6
2021–22 Budget estimate	43,560.7	1,057.9	44,618.6

Sources: PBS 2020–21 and 2021–22, Table 4a. Figures may not sum due to rounding.

Based on the Budget papers' prediction for GDP, that amount is 2.09% of GDP. Again, that's significantly less as a percentage of GDP than last year's prediction for this year (2.19%). That's because there's been a substantial reduction of $745.9 million due to foreign exchange rate adjustments as well as a significant increase in the government's estimates for GDP due to the faster than predicted economic recovery. In essence, the numerator has decreased while the denominator has increased. Again, it's a reason not to fret too much about precise percentages of GDP.

Is this funding consistent with the government's commitment?

We can't make a direct apples-to-apples comparison between the PBS's funding and the government's funding commitment in the 2016 DWP (page 180) and 2020 DSU (page 54) until we take into account a range of budget measures or variations, of which adjustments to foreign exchange and operational supplementation are the most significant. ASPI tracks those measures over time as they accumulate.

According to our analysis, once those measures are taken into account, the PBS's estimated actual number for 2020–21 is within $14 million of the DSU figure, which in Defence terms is essentially a rounding error. For 2021–22, Defence's funding is around $178 million short of the DSU funding line, but again that's a relatively minor 0.4% difference. Over the next two years, Defence's funding aligns very closely with the DSU model, although at the back end of the forward estimates in 2024–25 there's a shortfall of $1,244 million.

The differences between our analysis and the PBS can be accounted for by the fact that the PBS doesn't show all variations.[29] Defence officials assure us that, once all variations are taken into account, the government's appropriation aligns exactly with the DSU commitment.

We should also note that some measures require Defence to absorb the funding. That means it has to take on new tasks with no additional funding. The Pacific Step-up is one such measure (we look at the cost of the Pacific Step-up in Chapter 3). There's nothing wrong with that—governments constantly need to adjust their spending priorities in response to changes in the world. However, it can be very difficult to track those adjustments from the public information and often there doesn't appear to be a real reason why the numbers are not made public.

Since the DSU funding line was the same as the 2016 DWP's funding line for 2021–22 (once variations are taken into account), this means that the government has delivered on the funding commitments it made in 2016. But it hasn't increased its planned defence funding in the five years since the DWP was developed despite the marked changes in Australia's strategic environment, which the 2020 DSU noted have been faster than anticipated in 2016.

How much has defence funding increased since last year?

The consolidated funding for 2021–22 is an increase in nominal terms of $2,577 million from 2020–21, or 6.1%. In real terms, that's 4.1%, which is still a significant increase (Table 2.2).

Table 2.2: Consolidated defence funding increases, 2018–19 to 2024–25 ($ million)

	Nominal funding	Nominal increase	Nominal increase %	Real funding (2021–22 baseline)	Real increase	Real increase %	% of GDP
2018–19	37,239	2,313	6.6%	39,058	1,823	4.9%	1.91%
2019–20	39,185	1,946	5.2%	40,557	1,499	3.8%	1.97%
2020–21	42,042	2,857	7.3%	42,855	2,299	5.7%	2.04%
2021–22	44,619	2,577	6.1%	44,619	1,763	4.1%	2.09%
2022–23	48,162	3,543	7.9%	47,188	2,569	5.8%	2.21%
2023–24	51,150	2,988	6.2%	48,893	1,705	3.6%	2.25%
2024–25	53,330	2,181	4.3%	49,734	841	1.7%	2.23%

Source: PBS.

Actual achievement	Budget year estimate	Forward estimates

How is defence funding looking over the longer term?

Since 2000–01 the nominal defence budget has grown from $12,319 million to $44,619 million, or by 262%. In real terms, it's a more modest but still very healthy growth of 122%.

This is the ninth straight year of real growth. That growth is set to continue; the 2020 DSU confirmed the 2016 DWP funding model and extended it for a further four years out to the end of the decade in 2029–30. This was a major win for Defence, considering the twin impacts of the Covid-19 pandemic on GDP and the government's stimulus spending on its budget bottom line.

As noted, this year the budget has grown by 6.1% in nominal terms. Over the next three years, the strong growth continues at 7.9%, 6.2% and 4.3%, according to the PBS's numbers.

I discussed the longer term defence funding model in Chapter 2 of Part 1 of 2020–21's *The cost of Defence,*[30] but its key features can be summarised as follows:

- $575 billion total funding over the decade from 2020–21 to 2029–30
- $270 billion in capability investment, which includes acquisition and 'future sustainment'[31]
- 88% nominal growth over the decade compared to a 2019–20 baseline.

Determining the rate of real growth over the coming decade is very assumption dependent but, using the Budget papers' inflation estimates for the forward estimates followed by 2.5% annual inflation, we would see real growth of 49.8%. Such predictions are inherently unreliable due to the difficulty of predicting inflation. In comparison, over the decade to 2021–22, nominal growth has been 69.1% and real growth 41.3%.[32]

The difference between 2% of GDP and planned funding

As we've seen over the past year, predicting GDP is difficult but, according to the government's own GDP estimates in the 2021–22 Budget papers, defence funding will grow to around 2.25% of GDP over the next few years. That means that, in dollar terms, defence funding will exceed 2% of GDP by around $5 billion per year very soon (Table 2.3). Consequently, should any future government decide to limit spending to 2% of GDP, Defence will need to adjust its spending plans downwards by around $5 billion per year.

To give a sense of the scale of reprioritisation that would require, the estimated cost of sustaining Defence's 30 most expensive capabilities this year is $5.3 billion. It's also twice as much as this year's entire predicted spend on the Naval Shipbuilding Program ($2.5 billion). That said, the government has stated in both the 2016 DWP and the 2020 DSU that it won't link defence funding to any particular percentage of GDP.

Table 2.3: Difference between the DSU funding line and 2% of GDP ($ billion)

	2020–21	2021–22	2022–23	2023–24	2024–25
DSU defence funding	42.0	44.6	48.2	51.1	53.3
Funding as % of GDP	2.04%	2.09%	2.21%	2.25%	2.23%
2% of GDP	41.2	42.7	43.5	45.5	47.9
Difference	–0.9	–2.0	–4.7	–5.6	–5.4

Sources: 2020 DSU, 2021–22 Budget paper no.1.

2.2 Budget measures and adjustments

Budget measures and adjustments are changes to previous years' plans. They're published in the PBS and updated mid-year in the PAES. In the 2021–22 PBS, they're listed in PBS Table 2. The PBS doesn't explain what they are; for that, you need to go to Budget paper no. 2, which briefly explains all budget measures across government.[33] Defence's are on page 86, although some measures affecting Defence are listed under other portfolios that have the lead.

Because most of Defence's long-term commitments are set out in white papers (or the DSU), it generally has relatively few major Budget measures, other than foreign exchange adjustments and operations funding. And when it does, the PBS often doesn't state how much funding is involved and simply lists the figures as 'not for publication'.[34]

Measures in the 2020–21 Portfolio Additional Estimates Statements

There were a small number of measures in the 2020–21 PAES (PAES Table 6). The largest was a $287.2 reduction for 2020–21 (with larger numbers in subsequent years) due to foreign exchange. There was also a further $55.5 million in supplementation for Operation Covid Assist, bringing its total for 2020–21 to $136.2 million.

Measures in the 2021–22 Portfolio Budget Statements

The budget measures in this year's PBS sum to a $580.0 million reduction in funding. The largest element in that is a $745.9 million reduction due to exchange rate variations. That's partially balanced by $166.1 million in supplementation for operations.

For those hoping to see additional funding to deal with Australia's increasingly uncertain strategic circumstances, there's nothing there.

2.3 The Big 3

The PBS provides a breakdown of the Defence Department's top-level spending into key cost categories: workforce, operations, capability acquisition program, capability sustainment program, and operating (PBS Table 4b). We'll combine Defence's operations, capability sustainment program and operating costs into one gripped up operating number to create our 'Big 3' of workforce, operating and capital.[35] Note that these are spending categories, so they sum to serial 15 in PBS Table 1, not serial 5.

The balance between the Big 3 is shown in Figure A2 in 'Defence in 10 tables' at the front of this brief.

Workforce

Defence's workforce in 2021–22 is budgeted at $13,856.4 million, which is 31.1% of the total budget.

Table 2.4 shows Defence's workforce costs and numbers since the 2016 DWP. If we put aside the relatively big jump in spending from 2018–19 to 2019–20 (which is essentially an artefact of switching from ASPI's previous method for determining personnel costs to the new one Defence now includes in the PBS), real increases in spending on personnel broadly match the increase in Defence's personnel numbers. Over the forward estimates, in particular, there's a reasonably close match, as personnel numbers grow by 3.1% and real spending grows by 2.2%. So the alignment of people and dollars is probably broadly correct in the next few years.

Overall, Defence's workforce spending isn't growing as fast as its overall budget. That means that workforce spending will fall from around 33% of the total in 2019–20 to 28% by the end of the forward estimates. This is consistent with the 2020 DSU funding model, which predicts that workforce spending will fall to 26% of the total by the end of the decade, but it continues a striking longer term trend. A decade ago, personnel spending was over 40% of the total defence budget. That fall is being driven by the dramatic increase in acquisition spending. But it raises the question of whether the long-term balance of funding among the Big 3 is viable.

The workforce costs presented here include only Defence's own workforce and don't include the external workforce, which is covered by acquisition and sustainment programs. If you included their costs in Defence's workforce budget, it would increase it above one-third of the total budget. So workforce as a share of the budget might not be falling as dramatically as the Big 3 breakdown might indicate.

Table 2.4: Defence workforce costs since the 2016 Defence White Paper—annual increases

	2018–19	2019–20	2020–21	2021–22	2022–23	2023–24	2024–25
Personnel costs ($m)	11,922.0	12,877.9	13,458.7	13,856.4	14,210.9	14,614.0	15,037.9
Nominal increase %	–0.5%	8.0%	4.5%	3.0%	2.6%	2.8%	2.9%
Real increase %	–2.1%	6.6%	2.9%	1.0%	0.5%	0.3%	0.4%
Personnel	74,305	75,238	76,996	77,873	78,502	79,191	79,352
Personnel increase %	–2.1%	1.3%	2.3%	1.1%	0.8%	0.9%	0.2%
% of total defence budget	32%	33%	33%	31%	29%	29%	28%

Actual achievement	Budget year estimate	Forward estimates

Sources: PBS for budget year and forward estimates, Defence annual report for actual achievement.

Capability Acquisition Program

Defence's capital budget is essentially its Capability Acquisition Program, which is presented in PBS Table 5.[36] The predicted spend for 2021–22 is $15,766.1 million, which is 35.4% of the total budget. The four programs in it in descending order of size are military equipment; enterprise estate and infrastructure; ICT acquisition; and minors. We discuss those programs in more detail in Chapter 3.

As we've noted previously, the increase in defence spending over the decade is focused on the acquisition program. The 2020–21 Budget planned a massive 27.4% increase in acquisition spending for the year, to go from $11,212.1 million in 2019–20 to $14,281.2 million. That was over $3 billion more than the previous year. That was always going to be a major challenge, even without the added obstacle of Covid-19 disrupting global supply chains.

In the end, Defence and its industry partners did well but didn't hit the target. Defence is predicting an achievement of $12,658.9 million for 2020–21. That's a shortfall of around $1.6 billion against the target. But we should also note that the bulk of Defence's nearly $700 million funding reduction due to foreign exchange adjustments would have been applied to the acquisition program, so the shortfall is closer to $1 billion.

The other way of looking at this is that Defence managed to increase its acquisition spending by over $1.4 billion, or 12.9%. That it did so well in the middle of a pandemic is a very encouraging sign that Defence and industry will be able to meet the challenge of ramping up capability quickly to meet our increasingly uncertain strategic circumstances (see also the local versus overseas acquisition spending figures at the end of Chapter 3).

The big increases in acquisition spending are to continue (Table 2.5). There's another $3 billion increase planned for 2021–22, up 24.5% to $15,766 million. Beyond that, there are increases of 12.9%, 9.8% and 2.9% in nominal terms over the forward estimates. Can Defence and industry achieve a 24.5% increase? Maybe not in one year, but it's looking like it can sustain increases of over 10% per year.

Table 2.5: Defence capital program—annual increases since 2018-19

	2018–19	2019–20	2020–21	2021–22	2022–23	2023–24	2024–25
Capital program (nominal $m)	10,944.4	11,212.1	12,658.9	15,766.0	17,804.6	19,554.6	20,128.5
Nominal increase ($m)	1,211.8	267.7	1,446.8	3,107.1	2,038.6	1,750.0	573.9
Nominal increase %	12.5%	2.4%	12.9%	24.5%	12.9%	9.8%	2.9%
Capital program (real $m)	11,478.9	11,604.6	12,903.9	15,766.0	17,444.5	18,691.8	18,771.1
Real increase ($m)	1,102.8	125.7	1,299.3	2,862.1	1,678.5	1,247.3	79.3
Real increase %	10.6%	1.1%	11.2%	22.2%	10.6%	7.2%	0.4%

Actual achievement	Budget year estimate	Forward estimates

Sources: PBS.

Operating costs and the Capability Sustainment Program

The PBS now includes a breakdown of expenditure by key cost categories, including operations, capability sustainment and operating. The combined estimate for all three for 2021–22 is $14,946 million, which is 33.5% of the total defence budget. It's a 1% increase on 2020–21's spend of $14,814 million.

The biggest of the three elements by a long way is the Capability Sustainment Program, which is presented in PBS Table 6. Sustainment covers the cost of operating, maintaining and repairing Defence's capabilities. It doesn't include the cost of Defence personnel doing those activities, but it does include the cost of outside service providers. While the Capital Investment Program isn't broken down by service or group, the Capability Sustainment Program is.[37]

The 2020–21 PBS predicted a sustainment spend of $12,580.0 million; Defence achieved $12,183.7 million, which is a shortfall of $396.3 million or around 3.2%. Considering the impact Covid-19 has had on Defence's scheduled exercises and other activities, that's a very good achievement. This year, the estimate is $12,952 million, which is a 6.3% increase (Table 2.6). That should be achievable, assuming continuing improvements in the Covid-19 situation.

Table 2.6: Sustainment spending, 2018–19 to 2024–25

	2018–19	2019–20	2020–21	2021–22	2022–23	2023–24	2024–25
Capability Sustainment Program ($m)	11,579	12,096	12,184	12,952	14,502	15,222	16,379
Annual nominal increase	4.7%	4.5%	0.7%	6.3%	12.0%	5.0%	7.6%

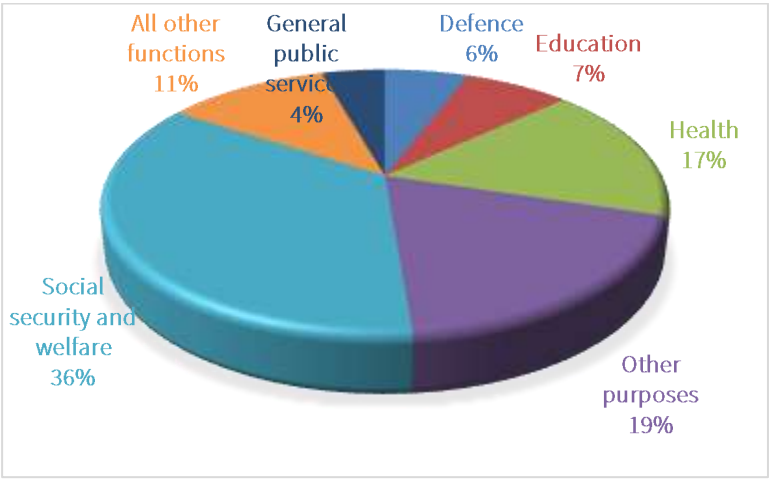
Actual achievement	Budget year estimate	Forward estimates

Sources: PBS.

2.4 Defence as a percentage of federal spending

While defence spending grew in real terms and as a percentage of GDP in 2020–21, it fell as a percentage of Australian Government expenses due to the government's massive social and stimulus spending, getting down to 5.1%. According to the Budget papers, as the economy recovers and the government's stimulus and welfare spending levels off, Defence will grow again as a percentage of expenses. This year, as broader government spending moderates, defence spending will rise back to 5.8% (Figure 2.1).

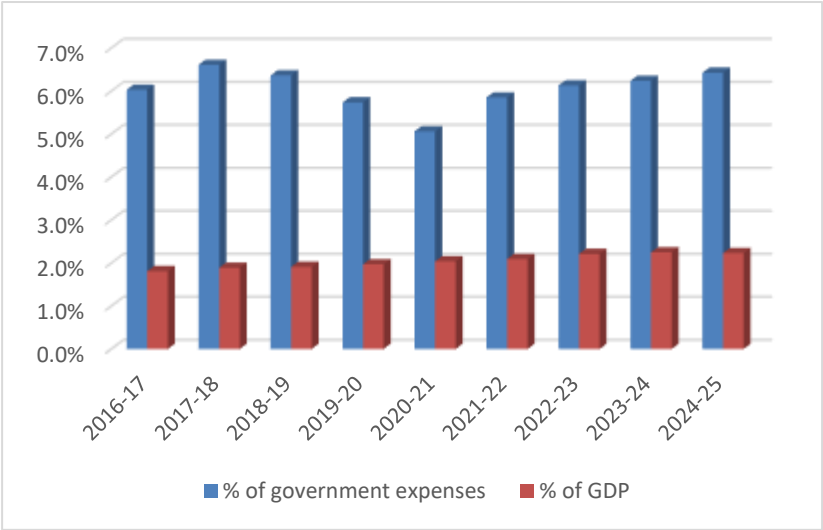
Figure 2.1: Australian Government expenses, by function, 2021–22



Source: Budget paper no. 1.

According to the Budget papers' estimates of government spending, defence funding will reach 6.4% by the end of the forward estimates, but that's still less than where it was in 2017–18, at 6.6% (Figure 2.2). So, while the defence budget is showing strong growth, it's not taking over the Australian Government budget.

Figure 2.2: Defence spending as a percentage of government expenses and GDP, 2016–17 to 2024–25



Sources: Budget papers, PBS.

Defence has only two 'programs' in the Australian Government's top 20 programs: the Army at 19 and the Air Force at 20, which is unchanged from 2020–21. The Navy is, however, very close behind.

2.5 Improvements in transparency in the PBS

Last year's PBS featured some changes to its presentation that improved transparency and support the 'clear read' principle. That included adopting a 'net cash' approach to bring Defence into line with other agencies. It was intended to provide a more transparent distinction between funding for ongoing activities and investment in future capabilities. This allows us to see the total cost of Defence's capital budget as well as each program's (that is, Defence's groups and services) acquisition budget. Defence also included a top-level breakdown by

major cost category, broadly similar to the Big 3 that ASPI had provided in *The cost of Defence*. This was another improvement, allowing comparisons between Defence's workforce, acquisition and sustainment/operating budgets.

This year, there are two further changes that provide greater transparency. The first is that the top 30 acquisition projects table (PBS Table 54) now also includes spending on capability elements other than military equipment, such as facilities, information and communications technology (ICT), and science and technology support. This delivers on First Principles Review goal to have a single integrated investment program and provides a more complete view of the total cost of acquiring capability. In some cases, the cost of the other elements is a very significant component of the total cost. Take the offshore patrol vessel, for example. It's budgeted at $3.7 billion for the ships themselves, but there's another $981 million for the other elements (mainly enhanced infrastructure).

The other addition is that, for the first time in any of Defence's reporting, there's some information on its ICT program (PBS Table 59). The PBS lists only the top five ICT projects, but that's a big improvement on nothing at all. Some of those projects are very large by any standard; the Enterprise Resource Planning Program that's intended to transform Defence's business functions has an approved budget of $604 million (so far as the FSP suggests there will be more) and a planned spend for this year of $146 million. Since it's crucial to the success of Defence's transformation strategy, it's good that there's finally a modicum of transparency about it.

Chapter 3: Where does the money go?

Key points

- In 2021–22, the Department of Defence plans to spend:[38]
    - $13,856 million to employ its allocation of 61,468 full-time uniformed and 16,405 public service personnel
    - $15,766 million on capital acquisitions, including $11,161 million on military equipment and $3,444 million on infrastructure
    - $14,946 million to operate, including $12,952 million on the sustainment of its equipment and facilities and $279.5 million to conduct operations.[39]
- With Middle East operations winding down, spending on operations is at its lowest level since before the INTERFET peacekeeping operation in East Timor in 1999.
- The cost of Defence's contractor workforce risks exploding as its acquisition and sustainment programs grow while its public service workforce remains static.

This chapter looks at what the average Australian taxpayer gets for their $1,731.12 per year (or $4.74 per day).[40] The discussion here is based on the Department of Defence's budget for 2021–22. Again, we assume readers have access to the PBS online, so we avoid duplicating its tables as much as possible.

3.1 How is the money divided up among groups and services?

Spending, by program

There are a number of ways to look at how the money is divided up. The first is among Defence's programs. In public service jargon, Defence's groups and services are programs.

Section 2 of the PBS (page 23) presents the outcomes and programs that the government expects from Defence in return for the funding that it's providing. There are two outcomes. Outcome 1 can be understood as the conduct of operations, while Outcome 2 is about ensuring that Defence has the ability to conduct them.

Outcome 1 comprises three programs, which essentially cover operations in different parts of the world. Outcome 2 comprises 18 programs, which are organisations. We won't look at programs 15–18, as they're 'administered' programs that aren't part of the Department of Defence. They deal with such things as military superannuation and housing assistance and therefore aren't directly related to military capability. They also aren't funded by the $43,560.7 million the department receives from the government. Each program has a statement of objectives, a statement of how the objectives will be achieved, performance criteria and targets. All are at very high level.

Defence's groups frequently undergo restructuring. In the past year, Program 2.1: Strategic Policy and Intelligence was split, suggesting that the structure set up for this group by the First Principles Review in 2015 was too unwieldy. The intelligence function became a new program (Program 2.14: Defence Intelligence) and the remaining part was renamed Strategy, Policy and Industry. Defence Intelligence Group contains the two

intelligence agencies that remained in the Department of Defence after ASD became a statutory agency in 2018 (the Australian Geospatial-Intelligence Organisation and the Defence Intelligence Organisation) as well as an intelligence policy function. Strategy, Policy and Industry Group now has four divisions: Contestability, Defence Industry Policy, International Policy and Strategic Policy.

Table 3.1 shows how Defence's budget is distributed among outcomes and programs. It also shows the changes between 2020–21 and 2021–22, as well as each program as a percentage of the total.[41]

Table 3.1: Resourcing, by departmental outcomes and programs, 2020–21 and 2021–22

Outcome/program	2020–21 estimated actual ($'000)	PBS 2021–22 ($'000)	% change since 2020–21	% of total 2021–22
Outcome 1				
Program 1.1: Operations Contributing to the Safety of the Immediate Neighbourhood	375	2,204	487.7%	0.0%
Program 1.2: Operations Supporting Wider Interests	568,628	217,885	–61.7%	0.5%
Program 1.3: Defence Contribution to National Support Tasks in Australia	195,843	59,413	–69.7%	0.1%
Outcome 1: Total department outputs	**764,846**	**279,502**	**–63.5%**	**0.6%**
Outcome 2				
Program 2.1: Strategic Policy and Intelligence	681,634	731,626	7.3%	1.6%
Program 2.2. Defence Executive Support	538,107	779,566	44.9%	1.7%
Program 2.3: Defence Finance	147,099	155,839	5.9%	0.3%
Program 2.4: Joint Capabilities Group	1,787,774	2,075,357	16.1%	4.7%
Program 2.5: Navy Capabilities	8,388,390	9,743,773	16.2%	21.9%
Program 2.6: Army Capabilities	9,552,398	9,830,992	2.9%	22.1%
Program 2.7: Air Force Capabilities	9,121,064	9,804,066	7.5%	22.0%
Program 2.8: Australian Defence Force Headquarters	208,628	254,600	22.0%	0.6%
Program 2.9: Capability Acquisition and Sustainment	785,781	784,429	–0.2%	1.8%
Program 2.10: Estate and Infrastructure	5,814,300	6,858,107	18.0%	15.4%
Program 2.11: Chief Information Officer	1,549,026	1,582,746	2.2%	3.6%
Program 2.12: Defence People	555,037	590,496	6.4%	1.3%
Program 2.13: Defence Science and Technology	530,785	541,146	2.0%	1.2%
Program 2.14: Defence Intelligence	474,430	540,906	14.0%	1.2%
Outcome 2: Total department outputs	**40,134,453**	**44,273,649**	**10.3%**	**99.4%**
Total department outputs	**40,899,299**	**44,273,649**	**10.3%**	**100.0%**

Note: This table contains own source revenue in addition to funding from government. There are also a number of costs that are managed centrally in Defence and aren't ascribed to any individual program. This accounts for the discrepancy between the total cost of the programs ($44,273.6 million) and the total Defence funding line in PBS Table 1, serial 15 or PBS Table 4b, serial 6 ($44,568.0 million).

Source: PBS.

This shows that the cost of operations is now only a small part of Defence's budget, as the three programs in Outcome 1 make up less than 1% of the total. That's a clear illustration of how operations in the Middle East are winding down.

Not surprisingly, the three services are the biggest programs. The Navy's budget has grown substantially since last year, driven in large part by the ramping up of the Naval Shipbuilding Program and other capital acquisitions. All three services are now very close, despite the Army having around the same number of people as the Air Force and the Navy combined. In fact, all three are now within a percentage point of each other at around 22% of the total. For those who think a balanced force is the ideal one, we've reached nirvana.[42]

The next biggest is Estate and Infrastructure Group at 15.4%. This is in part due to its very large acquisition budget, but also to its role in providing bases services to the rest of Defence. Similarly, as Chief Information Officer Group provides ICT services to the rest of Defence, it has a large budget of over $1.5 billion—Defence ICT is big business.

With the establishment of Chief Joint Capability as a capability manager in his own right, Joint Capabilities Group's budget has emerged as one of the biggest in Defence at a little over $2 billion this year.

One might think that Capability Acquisition and Sustainment Group's budget would be one of the biggest, since it manages enormous acquisition and sustainment programs, but it's listed at only 1.8%. That's because the group's spending is treated differently from Estate and Infrastructure Group's. While both deliver projects and services on behalf of Defence's other groups, the cost of acquiring and sustaining military equipment is ascribed to the capability managers, whereas the cost of building and maintaining facilities and providing garrison services is ascribed to Estate and Infrastructure Group.

Capital spending, by program

The 'net cost' presentation introduced into the PBS in 2020–21 now allows us to distinguish programs' capital expenditure from their personnel and operating expenses.[43] While this runs the risk of arguments about which service is getting short-changed, it's a big step forward for transparency. We've listed the programs' capital budgets in Table 3.2.[44]

Table 3.2: Capital budgets, by program, 2020–21 – 2021–22 ($'000)

Outcome/program	Total capital, 2020–21	Total capital, 2021–22	% increase	% of total, 2021–22
Outcome 1				
Program 1.1: Operations Contributing to the Safety of the Immediate Neighbourhood	0	0	0	0.0%
Program 1.2: Operations Supporting Wider Interests	1,336,552	1,328	–100.0%	0.0%
Program 1.3: Defence Contribution to National Support Tasks in Australia	9,167	0	–99.9%	0.0%
Outcome 1: Total capital expenditure	**1,345,719**	**1,328**	**–99.9%**	**0.0%**
Outcome 2				
Program 2.1: Strategic Policy and Intelligence	212,313	216,471	2.0%	1.4%
Program 2.2. Defence Executive Support	175,819	311,829	77.4%	1.9%
Program 2.3: Defence Finance	5	6	20.0%	0.0%
Program 2.4: Joint Capabilities Group	258,552	400,847	55.0%	2.5%
Program 2.5: Navy Capabilities	3,366,978	4,369,612	29.8%	27.3%
Program 2.6: Army Capabilities	3,193,801	3,255,590	1.9%	20.3%
Program 2.7: Air Force Capabilities	3,819,427	4,299,921	12.6%	26.8%
Program 2.8: Australian Defence Force Headquarters	51,533	34,378	–33.3%	0.2%
Program 2.9: Capability Acquisition and Sustainment	533	8,975	1,583.9%	0.1%
Program 2.10: Estate and Infrastructure	1,774,038	2,643,452	49.0%	16.5%
Program 2.11: Chief Information Officer	203,961	281,017	37.8%	1.8%
Program 2.12: Defence People	11,418	11,657	2.1%	0.1%
Program 2.13: Defence Science and Technology	4,223	47,059	1,014.3%	0.3%
Program 2.14: Defence Intelligence	100,221	151,892	51.6%	0.9%
Outcome 2: Total capital expenditure	**13,172,822**	**16,032,706**	**21.7%**	**100.0%**
Total department capital expenditure	**14,518,541**	**16,034,034**	**10.4%**	**100.0%**

Note: The lines in this table are funded by appropriation and own sources revenue. It does not sum exactly to Defence's Capability Acquisition Program ($15,766 million), as it also includes items that are treated as capital under accounting guidelines but are not part of the Capability Acquisition Program.

Source: PBS.

The three services together make up 74.4% of the total capital budget. We can see from this table a key reason why the three services' total budgets (Table 3.1) are very similar even though the Army has around twice as many people as each of the other two; the Navy and Air Force each have over $1 billion more in their capital budgets this year than the Army.

Estate and Infrastructure has a very large capital budget, mainly because it delivers the Enterprise Estate and Infrastructure Program. As with total program funding, while Capability Acquisition and Sustainment Group manages huge acquisition programs, the cost of those programs is ascribed to the capability managers, so its own capital budget is very small.

Outcome 1

Outcome 1 is 'Defend Australia and its national interests through the conduct of operations and provision of support for the Australian community and civilian authorities in accordance with Government direction.' The three programs that make up Outcome 1 are:

- Program 1.1: Operations Contributing to the Safety of the Immediate Neighbourhood.
- Program 1.2: Operations Supporting Wider Interests
- Program 1.3: Defence Contribution to National Support Tasks in Australia.

Funding for Outcome 1 is $279.5 million (PBS Table 12). As noted above, conducting operations is now only a very small part of Defence's budget—about 0.6%. However, at the peak of Middle East operations, the cost reached 6.1% of Defence's total budget in 2010–11.

The resources for Outcome 1 don't exactly match the net additional cost of operations in PBS Table 3 ($271.4 million) because not all operations are listed in PBS Table 3, only the ones that Defence receives no-win, no-loss supplementation funding for. Defence has to pay for the smaller ones out of its own pocket. That will be only around $8 million this year. While Defence received $136.2 million in 2020–21 as supplementation for Operation Covid-19 Assist, the activity will no longer be funded through operational supplementation.

The PBS lists 21 operations on page 30 with a high-level description but without costs or numbers of deployed personnel. Some information on deployed personnel numbers can be found on Defence's website.[45] The 2019–20 annual report also provides a list of operations and numbers of personnel deployed under its reporting against Program 1.2 (pages 28–30) and programs 1.1 and 1.3 (pages 31–32).[46]

Operational supplementation

Defence receives supplementation on a no-win, no-loss basis for large operations. This means extra money to cover operating costs and the rapid acquisition of any equipment specific to an operation. If Defence was going to buy the equipment anyway (that is, the equipment is already included in its investment program), then it generally doesn't receive supplementation for the purchase.

Operational supplementation is shown in PBS Table 3. At $271.4 million, it's a massive decrease compared to last year ($751.3 million). In fact, it's the lowest since the start of the Timor intervention in 1999 (Figure A.8 in 'Defence in 10 tables' shows spending on operations over the past two decades). That's a clear indication of how far implementing the 2020 DSU's intent to refocus away from the Middle East to the Pacific has progressed.

Middle East operations

Middle East operations haven't ended, but they're winding down. At $212.1 million this year, they're well down from their peak of $1,298.7 million. Including 2021–22, Australia has spent $14,549.9 million on operations in the Middle East since the initial intervention in Afghanistan in 2001 (Table 3.3).

Table 3.3: Cost of Middle East operations, 2001–02 to 2021–22 ($ million)

Operation	Peak year	2021–22 estimate	Total
All Iraq operations[a]	501.5 (2007–08)	40.6	4,213.6
All Afghanistan operations[b]	1,284.9 (2010–11)	67.2	8,588.9
Operation Accordion (support for Middle East operations)	221.1 (2020–21)	104.3	1,426.6
Operation Manitou (maritime security operations)	64.1 (2019–20)	0	320.8

a Includes the second Gulf War, Operation Kruger and Operation Okra.

b Includes Operation Slipper, Afghanistan force protection and Operation Highroad.

Sources: Defence annual reports; PBS.

Outcome 2

Outcome 2 is 'Protect and advance Australia's strategic interests through the provision of strategic policy, the development, delivery and sustainment of military, intelligence and enabling capabilities, and the promotion of regional and global security and stability as directed by Government.'

Outcome 2 contains the (now) 14 programs that make up Defence's groups and services (not including the four administered programs). The total resourcing for the 14 programs is $44,273.6 million. PBS Table 16 gives a high-level summary of the budget for each program. Pages 44–76 outline each program, giving its objectives, performance criteria and targets. Each also has a cost summary.

Each of the three service programs also provides estimated deliverables for its platforms for the previous and the budget year. The annual report details actual achievement. Those deliverables are presented in flying hours for aircraft fleets and unit availability days for ships (no deliverables are provided for vehicle fleets). While flying hours are broken down by aircraft type, naval assets are aggregated, so it isn't possible to distinguish between different classes of frigates and destroyers, or indeed between ships and submarines.

ASPI publishes historical data on ADF aircraft fleets' flying hours and sustainment costs in its Cost of Defence online database.[47]

The Australian Signals Directorate

ASD is a statutory agency with the Defence portfolio, not one of the Department of Defence's programs. In 2021–22, it will receive $1,057.9 million, or about 2.4%, of the government's consolidated defence funding. A small amount of other external revenue brings its total budget up to $1,060.7 million. Its budget statements start at page 147 of the Defence PBS.

ASD has only one outcome: 'Defend Australia from global threats and advance our national interests through the provision of foreign signals intelligence, cyber security and offensive cyber operations, as directed by Government.' That outcome is delivered by one program—Program 1.1: Foreign Signals Intelligence, Cyber Security and Offensive Cyber Operations.

ASD's capital expenditure for this year is $205.5 million. At 19.4% of its budget, that's a relatively small percentage compared to the Department of Defence, but cyber operations are considerably less capital intensive than acquiring fleets of ships, aircraft and armoured vehicles. Its staffing allocation is classified, so the number of its employees is not provided in the PBS, although its employee expenses are $308.2 million, or 29.0% of its total budget.

3.2 Workforce

Another way to describe how the money is divided up is among the Big 3: the workforce–investment–operating triumvirate. We outlined the top-level balance between the Big 3 in Chapter 2 but go into more detail here. We'll start with the workforce.

Defence spent $13,458.7 million on its workforce in 2020–21. Its full-time uniformed workforce reached 60,486—that's the first time it's cracked 60,000 since 1993–94 when ADF strength was shrinking as part of the post-Cold War peace dividend.

The personnel budget for 2021–22 is $13,856.4 million (from PBS Table 4b). This allows Defence to employ the full-time workforce allocation shown in Table 3.4 (a more complete table including the forward estimates is PBS Table 8). That funding doesn't cover Defence's external workforce, which is included in the cost of acquisition projects or sustainment activities.

Table 3.4: Defence planned full-time workforce allocation, 2021–22

Navy	Army	Air Force	ADF total	APS	Defence total
15,449	30,932	15,087	61,468	16,405	77,873

Source: 2021–22 PBS, Table 8.

The workforce narrative

We discussed the big picture for Defence's workforce growth in some detail in Part B of 2020–21's *The cost of Defence* (pages 32–35), so we'll limit ourselves to a summary here with updated numbers.

The 2016 DWP increased the ADF's workforce allocation by around 2,500 over the decade to 2024–25, but that was an increase of 4,400 from where the ADF was actually at. The DSU added a further 800 ADF positions as an interim measure until the government considered Defence's longer term workforce requirements. That hasn't yet happened, and the workforce allocation table in the 2021–22 PBS still reflects the DSU picture, not the longer term increases.

Table 3.5 shows planned workforce numbers (scanning left to right) as well as how those plans have changed over time (scanning top to bottom). Actual numbers achieved are in the blue boxes. From that, we can see that the ADF has grown by 2,425 (or about 4%) in the five years since the 2016 DWP. However, that growth hasn't been even. There was very little growth in the first three years, followed by around 2,100 in the past two. We hope that this indicates that Defence's efforts to increase its uniformed workforce are gathering steam. Over the forward estimates, it plans growth of a further 2,419 (another 4%). That should be achievable if the past two years' growth rate is sustained.

Table 3.5: Defence's uniformed workforce, targeted and achieved, 2015–16 to 2024–25

	2015–16	2016–17	2017–18	2018–19	2019–20	2020–21	2021–22	2022–23	2023–24	2024–25
2016–17	58,061	59,209	59,681	59,794	60,090					
2017–18		58,680	59,194	59,794	60,090	60,585				
2018–19			58,475	59,794	60,090	60,585	61,027			
2019–20				58,380	60,090	60,585	61,027	61,402		
2020–21					59,109	60,826	61,459	62,054	62,726	
2020–21						60,486	61,468	62,063	62,735	62,905

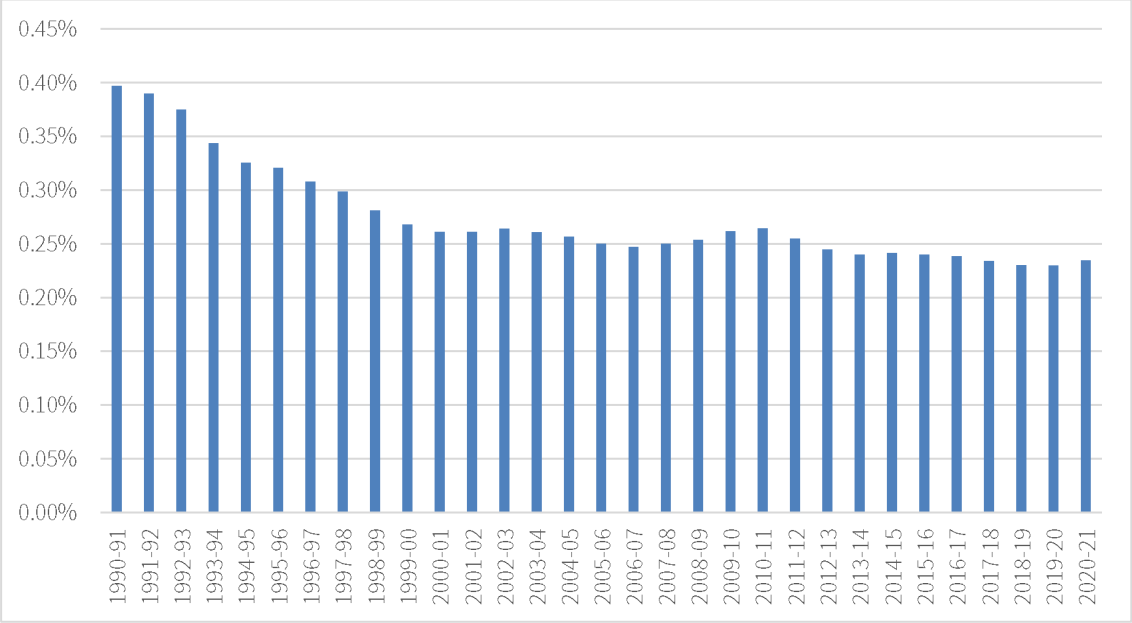
Sources: PBS, Defence annual reports.

Actual achievement	Budget year estimate	Forward estimates

The big question is about what kinds of increases are needed to meet the ADF's longer term needs. In Part B of 2020–21's *The cost of Defence*, we did some (assumption-rich) high-level modelling based on Defence's statement that the DSU funding model already incorporates funding for that increased workforce, even though the government hasn't yet agreed to the increased numbers (pages 33–34). We suggested that the increase it was planning for could be as much as 12,000 people. That's a lot, but, if the increases of 1,000 per year for the past two years can be replicated, then it may be achievable.

Another way of assessing achievability is by looking at the ADF as a percentage of the Australian population. Since the Cold War, the ADF has fallen from around 0.4% to around 0.25% of the population (Figure 3.1). Should the ADF seek to continue to grow at around 1,000 personnel per year, that's annual growth of about 1.6%. That growth rate is broadly consistent with Australia's population growth over the past decade or so (interrupted by the net zero immigration caused by Covid-19). In other words, the ADF would simply need to maintain a constant 'share' of the Australian population, rather than continue to decline. So, while growing the ADF has proven to be challenging, achieving substantial growth over the coming decade isn't inherently implausible. However, if one thing stands out in the trajectory of the ADF workforce over the past 30 years, it's that it's easy to reduce numbers but very hard to grow them again.

Figure 3.1: ADF full-time personnel as a percentage of Australia's population, 1990–91 to 2020–21

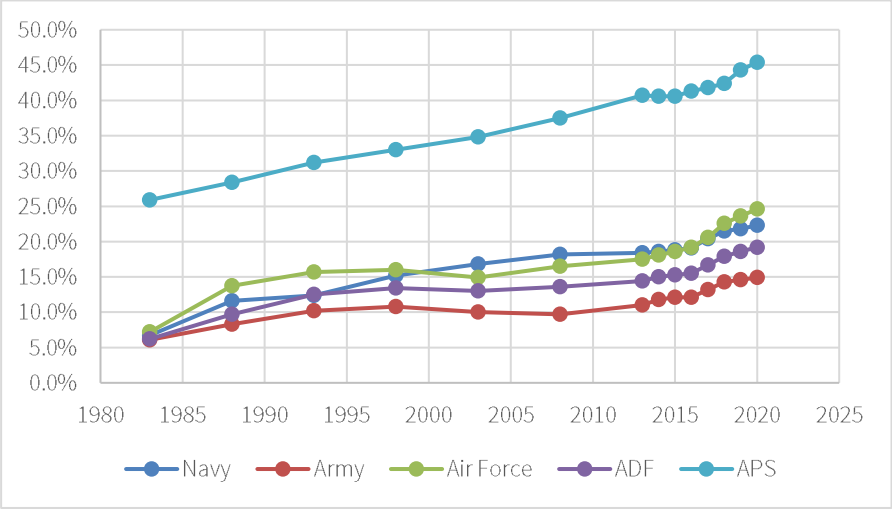


Sources: Defence annual reports; Australian Bureau of Statistics, Australian demographic statistics, cat. no. 3101.0.

Women in Defence

The percentage of women in Defence continues to rise in all three services and the APS (Figure 3.2). Women now form 19.2% of the ADF. The Air Force has the highest percentage of women of the three services, at 24.6%. Overall, progress has been slow but steady, although the Air Force has managed over 1% growth per year on average over the past five years. The percentage of women in Defence's APS staff is higher, at 45.4%, but that's significantly lower than in the APS in general, where women make up 60%.[48]

Figure 3.2: Percentage of women in Defence, 1983 to 2020



Source: Defence annual reports.

External workforce

In Part 2 of *The cost of Defence* last year, I explored the cost of Defence's rapidly growing workforce. At that time, Defence's external workforce constituted its second biggest 'service', behind the Army and ahead of the APS. According to Defence's latest external workforce census in March 2021, the external workforce has now grown to be the largest service, at 32,487 (Table 3.6).

Table 3.6: Defence's external workforce, July 2019 to March 2021 (full-time equivalent)

Workforce	July 2019[a]	March 2020[a]	March 2020[b]	September 2020[b]	March 2021[b]
Contractors	4,669	6,567	5,361	5,646	6,810
Consultants	250	255	255	284	314
Outsourced service providers	18,405	21,811	23,017	25,710	25,363
Total	**23,324**	**28,633**	**28,633**	**31,640**	**32,487**

Sources:

a Defence freedom of information log, online.

b Defence external workforce census March 2021, provided by Defence.

The March 2021 census has different numbers for March 2020 from those released earlier under freedom of information requirements. The revised numbers for March 2020 have the same total, but recategorise around 1,200 contractors as outsourced service providers.

It's difficult to work out what Defence's external workforce costs. Most outsourced services are part of Defence's sustainment costs (for example, conducting maintenance on aircraft or providing meals, security and cleaning services at Defence's bases across the country), but the cost of outsourced service providers at some level isn't a concern. Nobody's suggesting that we should go back to the days when uniformed people did all maintenance or ran all the messes on bases.

The main area of concern is in the number of contractors. By Defence's own definition, these are people doing jobs normally done by Defence's APS or ADF staff. They aren't consultants with particular sought-after skills. They're largely people with the sorts of skills that the public service should have to do public service jobs. However, in the face of strict caps on its workforce allocation, and only very minimal planned growth, Defence has had to turn to service providers in order to have the people and skills to run its rapidly growing capital and sustainment programs.

The PBS doesn't disclose the cost of Defence's contractors. However, at Senate estimates hearings on 27 October 2020, Defence officials stated that 'our contractor workforce that we calculated for 2019–20 … it's $1.52 billion on contractors.' At the same hearings, they also stated that 'the 2020–21 Defence Department funding included $2 billion for civilian employees.'[49]

That allows us to do some very rough calculations to work out the average cost of a public servant and a contractor. Defence's APS workforce in 2020–21 was 16,510, so the average cost for a public servant was around $121,000. Based on the way Defence costs its people, that number is likely to include all benefits, not just salary. According to Defence's March 2020 census, it was using 5,361 contractors. That works out to $283,000 per contractor—about 132% more than the APS average, or $162,000 more.

Broadly speaking, the problem that Defence has gotten itself into is that it's paying contractors consultants' rates. That might not be a problem if Defence is getting value for that expenditure. Unfortunately, it can't say whether it is getting value for money because it hasn't examined the issue. In response to a question on notice

from the Senate ('Has the agency performed any analysis on whether it costs more to engage staff as contractors compared with hiring staff as employees? If yes, please provide this analysis.'), Defence replied: 'Defence has not undertaken a comparative cost analysis of contractors compared to APS staff.'[50]

It doesn't seem to be a particularly responsible use of public funds if Defence can't assure itself, the government and the Australian public that its $1.52 billion in expenditure on contractors is value for money. It also means that Defence can't provide advice to the government about the appropriate balance between APS staff and contractors.

This is an issue that will have increasing salience. In the past two years alone, the number of contractors in Defence has grown by 2,141, from 4,669 to 6,810—a 45% increase. If a contractor costs on average $162,000 more than a public servant, Defence is now paying $1.1 billion a year more than it would if those workers were public servants. And the way that spend is reported, by being clumped into acquisition and sustainment costs, inflates the achievement in these areas, while also undercounting the actual personnel costs faced by Defence.

But that $1.52 billion likely to be just the tip of the iceberg that Defence is heading for. Over the decade, Defence's acquisition program will grow from around $11 billion per year to nearly $30 billion. Its sustainment program will grow from $12.6 billion to $23.8 billion. The projects and activities that make up those numbers will require substantially more people to design and manage them. If Defence can't hire public servants, then it will need to hire contractors.

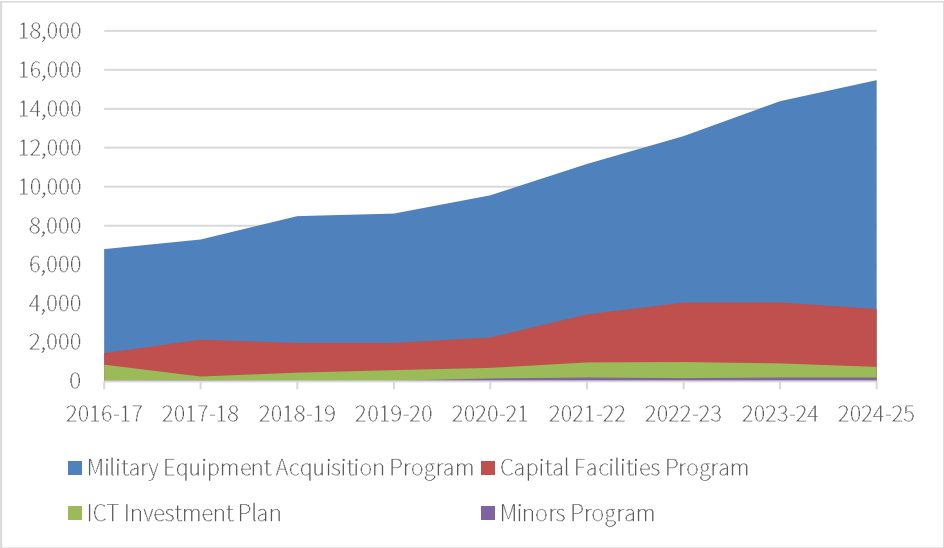
Aside from the cost, this risks exacerbating the deskilling of Defence and the public service more generally as public servants are lured away by the prospects of significantly greater salaries. Everyone who works or has worked in Defence knows former colleagues who left Defence but returned the next day to do the same job as a contractor on twice the pay. The genie is already out of the bottle. It's hard to say whether Defence can get the genie back in the bottle, but at the moment it doesn't seem to be trying.

3.3 Capital

As discussed in Chapter 2, Defence's planned acquisition budget for 2020–21 was $14,281 million. It underachieved against that by about 12.8%, spending $12,658 million. That was caused by a combination of exchange rate adjustments and Covid-19-induced disruptions to supply chains and production. Nevertheless, Defence still achieved a record spend, with a very significant increase of $1,446 million, or 12.9%. It's planning another big increase of 24.5% this year. It might not be able to achieve that but, if it can grow at 12.9% per year, it should be able to the swallow the elephant presented by the Integrated Investment Program.

The capital budget is further divided into smaller (but still huge) programs (see PBS Table 5). The breakdown over the forward estimates is illustrated in Figure 3.3.

Figure 3.3: Breakdown of Defence's capital programs, 2016–17 to 2024–25 (nominal $ million)



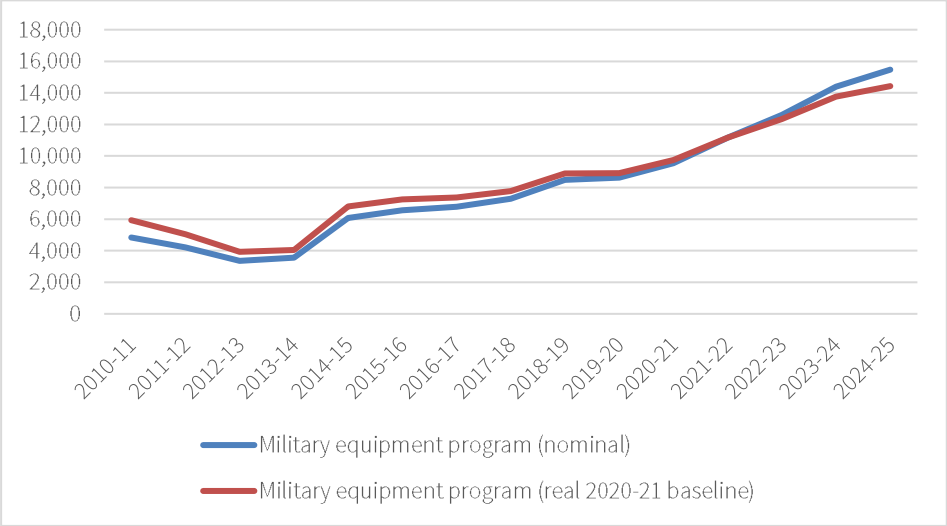
Sources: PBS, PAES.

Military Equipment Acquisition Program

The Military Equipment Acquisition Program's projects are delivered by Capability Acquisition and Sustainment Group on behalf of the capability managers. It's always the largest of the acquisition programs and averages around 70% of the total program. In 2020–21, it spent $9,549.7 million. That was about $1.2 billion short of the target, but still a record spend and major increase on 2019–20.

Like the capital program as a whole, the military equipment program is forecast to grow dramatically in 2021–22 by $1,611 million, or 16.9%. Whether Defence gets there is likely to depend on how quickly global supply chains recover from the disruptions caused by Covid-19 (and on how much it spends on contractors out of its acquisition budget). Figure 3.4 shows that by the end of the forward estimates the program will have enjoyed a decade of strong growth.

Figure 3.4: Military equipment acquisition spending, 2010–11 to 2024–25 ($ million)



Sources: PAES, PBS.

PBS Table 54 lists Defence's top 30 military equipment acquisition projects by 2021–22 forecast expenditure. The table also gives a useful summary of the projects' key goals for the year. Projects below the top 30 aren't covered. This year, for the first time, the table includes the cost of what Defence is terming 'Other project inputs to capability (OPIC)'. It defines those as 'other elements that are not part of the major capability system … this could include facilities, information communications technology and research and development.' This provides greater transparency in giving a more complete view of the total cost of acquiring capability. In some cases, the cost of the other elements is a very significant component of the total cost. Take the offshore patrol vessel, for example. It's budgeted at $3.7 billion for the ships themselves, but there's another $981 million for the other elements, which are mainly enhanced infrastructure. This year, the cut-off for the Top 30 is the Collins satellite communications capability, at a $101 million planned spend for the year.

Figure A.5 in 'Defence in 10 tables' shows the size of the 10 largest projects by planned 2021–22 spend, illustrating their impact on the overall program. This year, the F-35A Joint Strike Fighter is once again the top spender, with a forecast budget of $1,955 million, still well ahead of the future submarine at number 2. However, the Future Submarine Program is planning to crack $1 billion for the first time ($1,064 million between equipment and OPIC).[51] We discuss individual projects in the top 30 in more detail in Chapter 4 on capability.

ASPI publishes historical data on acquisition costs in its Cost of Defence online database.[52]

Project approvals

For several years now, the PBS hasn't provided a table listing equipment projects scheduled for government consideration in the coming year. Nor does the Defence annual report provide a comprehensive list of project approvals considered by the government in the previous year. Information on individual project approvals trickles out haphazardly and incompletely when the government sees fit to distribute a media release, but it's often hard to tell what exactly has been approved. It's a very poor state of affairs. The government has claimed extraordinarily large numbers of approvals by historical standards. That's because it now includes approvals for small amounts of money for early project development work, so it's not apples to apples. In terms of traditional first- and second-pass approvals, the numbers seem broadly consistent with historical numbers—but it's hard to be sure, as the government isn't releasing comprehensive information.

Systemic reporting of project approvals and the schedule of planned approvals should be provided by Defence to the Parliament as a matter of routine, along with routine reporting on the progress, risks and challenges of the largest projects.

Enterprise Estate and Infrastructure Program

The second biggest capital program delivers infrastructure. It's now called the Enterprise Estate and Infrastructure Program. Its projects are delivered by Defence's Estate and Infrastructure Group. We've noted previously that we're in a golden age of defence infrastructure construction. While there have been a few ups and downs, its overall trajectory has been very healthy, and spending has averaged over $2 billion over the past four years. Even during Covid-19 last year, it spent a record $2,260 million. That was $349.8 million less than the very challenging target for the year, but still a very commendable outcome.

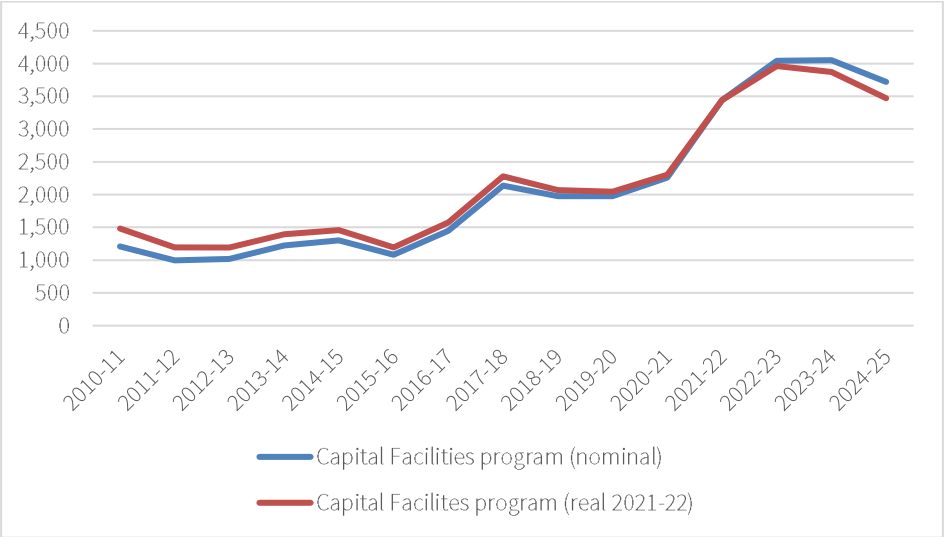
The good times continue this year, though its target could be too much to swallow; it's planning a further 52.4% growth on last year's record, to $3,444.1 million before dipping in later years of the forward estimates. Because so much of the infrastructure budget is spent in regional Australia, and the government's policy strongly

encourages prime contractors to use local small businesses, projects can have a substantial local economic impact. There's no doubt that the government would really like to see that money get spent as a form of Covid-19 stimulus spending, but it's a huge jump.

We've come a long way from the days when facilities were Defence's 'broken backbone' and were neglected as the department prioritised its equipment program. It was only five years ago that the infrastructure program was a little more than $1 billion.

Towards the end of the forward estimates, spending levels off and decreases, as Figure 3.5 shows.

Figure 3.5: Enterprise Estate and Infrastructure Program, 2010–11 to 2024–25 ($ million)



Sources: PAES to 2018–19, PBS from 2019–20.

PBS Appendix D covers the Enterprise Estate and Infrastructure investment program, outlining at a high level what work each project is conducting and the project's total budget, spend to date and planned spend for 2021–22. PBS Table 56 details this year's planned expenditure on approved major capital facilities projects. The biggest spenders are:

- RAAF Base Tindal Redevelopment Stage 6 and United States Force Posture Initiative Airfield Works and Associated Infrastructure at Tindal in the Northern Territory with a spend of $123.7 million (total budget $1,173.9 million); this follows a $71 million spend in 2020–21
- Offshore patrol vessel facilities at Darwin, Cairns, HMAS Stirling and Henderson in Western Australia at $120.2 million (total budget $918.5 million)
- Hunter-class frigate facilities in South Australia and HMAS Stirling and Henderson at $110.3 million (total budget $918.8 million)
- Larrakeyah Defence Precinct Redevelopment Program in Darwin at $89.6 million (total budget $495.6 million); this follows a very substantial $136.4 million in 2020–21
- Armoured Fighting Vehicles Facilities Program Stage 1 in Lavarack Barracks in Townsville, Edinburgh in Queensland and Puckapunyal in Victoria at $87.3 million (total budget $235.1 million)

- P-8A maritime patrol aircraft facilities at a number of bases at $75.3 million; this large infrastructure project is nearing completion as $628.1 million of its total budget of $792.6 million has already been spent.

Other large facilities projects that are nearing completion include:

- F-35A facilities—$1,424.9 million of $1,485 million spent
- HMAS Cerberus, the Navy's main training facility—$337.0 million of $465.6 million spent
- Air traffic control infrastructure (part of the AIR 5431 complex of projects)—$390.8 million of $409.9 million spent
- C-27J battlefield airlifter facilities at RAAF Base Amberley in Queensland—$367.1 million of $370.4 million spent
- HMAS Stirling redevelopment Stage 3A—$348.8 million of $366.8 million spent.

In addition to the work at Tindal and the offshore patrol vessel and Hunter-class frigate facilities, other projects that are starting to ramp up and will be future big spenders include:

- HMAS Watson redevelopment in Sydney Harbour (total budget $430.5 million)
- facilities for the AIR 555 electronic warfare aircraft at various air bases (total budget $294.5 million)
- AIR 555 airborne intelligence, surveillance and reconnaissance and electronic warfare capability, focused on RAAF Edinburgh in Adelaide (total budget $294.5 million).

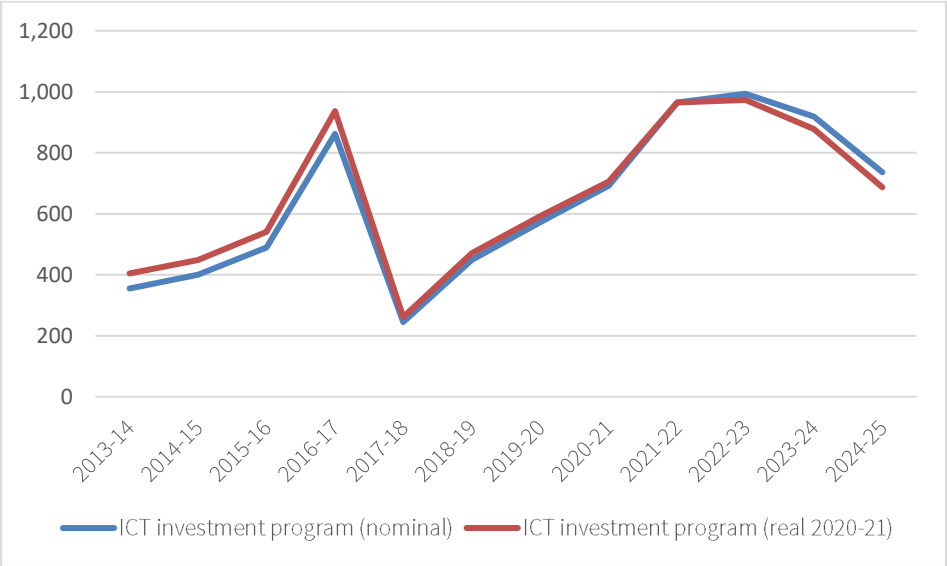
Facilities projects scheduled for government and Parliamentary Works Committee consideration in 2020–21 are listed in PBS Appendix E.

More detail on Defence's infrastructure projects is in the business cases that Defence submits to the Parliamentary Standing Committee on Public Works.[53]

ICT Acquisition Program

The third subprogram is the ICT Acquisition Program. It's much smaller than the first two, at around 6% of the total acquisition program. Nevertheless, it's still budgeted at $965.4 million for 2021–22. That's a big increase of 38.8%. If it gets there, it will set a record for the program. That said, the trajectory of the program is a little confusing because of some substantial fluctuations that can occur mid-year (Figure 3.6).

Figure 3.6: ICT investment program, 2013–14 to 2024–25 ($ million)



Sources: PAES to 2018–19, PBS from 2019–20.

One small step for transparency

For some time, ASPI has been advocating for greater transparency about Defence's ICT program. Considering that the Defence ICT acquisition and sustainment budgets are larger than the budgets of many federal agencies, the complete lack of any public reporting did not well serve the Australian Parliament or people. Therefore, it's very nice to note that in this year's PBS there is, for the first time in any of Defence's reporting, some information on its ICT program (PBS Table 59). It covers only the top five ICT projects, but that's a big improvement on nothing at all.

Some of those projects are very large by any standard; the Enterprise Resource Planning Program that's intended to transform Defence's business functions (such as financial management, asset management, personnel management and logistics) has an approved budget to date of $604 million and a planned spend for this year of $146 million. Since the program's crucial to the success of Defence's transformation strategy, it's good that there's finally a modicum of transparency around it. A very welcome further step would be the inclusion of Defence's biggest ICT projects in the ANAO's *Major projects report*.

The Minors Program

The Minors Program covers small projects. Not only are the projects small, but the total program budget is a small part of the acquisition program. Nevertheless, it achieved massive growth last year, increasing its spend from $43.5 million in 2019–20 to $157.5 million. There's nothing in the PBS that explains how or why that happened, but the program stays around that level over the forward estimates. Hopefully that's an indication that Defence is finding ways to move small scale projects more quickly through its capability development process.

3.4 Operating and sustainment costs

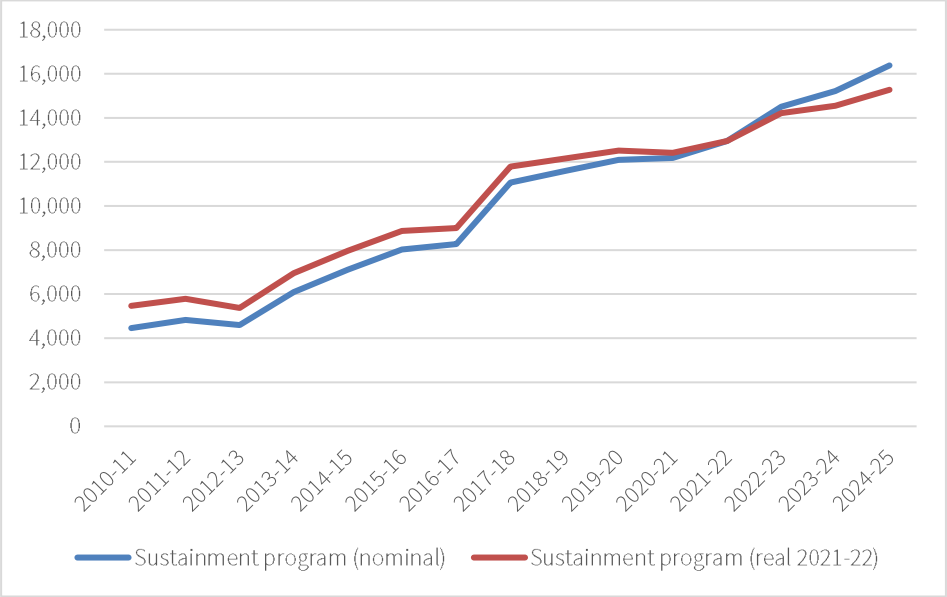
The PBS now provides a high-level breakdown of the defence budget by key cost categories, which include operations, the Capability Sustainment Program and operating costs. Combined, they add up to $14,945.5 million for 2021–22, or 33.5% of Defence's budget.[54]

There's no breakdown of the subcategory of operating costs. It's $1,713.8 million in 2021–22. It pays to keep the lights on. We've discussed operations already in Chapter 2.

Sustainment

The biggest element of the operating budget is the Capability Sustainment Program. This year, Defence plans to spend $12,952.2 million on sustainment, or 86.7% of its total operating budget (Figure 3.7).

Figure 3.7: Capability Sustainment Program, 2010–11 to 2024–25 ($ million)



Sources: PBS and PAES.

Like Defence's acquisition program, the sustainment program has enjoyed strong and steady growth over the past decade. The jump of 33.6% in 2017–18 appears to have been largely an artefact of reclassifying some operating costs as sustainment costs. That growth is planned to continue over the forward estimates and, according to the 2020 DSU funding model, over the decade to 2029–30. It will need to, as many of the systems coming into service both now and in the future will have substantially higher operating costs than those they're replacing.[55]

The top 30 sustainment 'products' are presented in PBS Table 55 with planned 2021–22 spending and a short description of priorities for the year. The sustainment program isn't dominated by a small number of projects to quite the same extent as the acquisition program, but nonetheless there are a few standouts. As has been the case for many years, the Collins-class submarine is the most expensive product. This year, the target is $671 million, close to last year's $661 million. The cut-off for the top 30 is the minehunter coastal fleet at $66 million. We show the top 10 in Figure A.6 in 'Defence in 10 tables'. We discuss individual sustainment products in Chapter 4 on capability.

ASPI publishes historical data on sustainment costs in its Cost of Defence online database.[56]

3.5 Where's the money spent?

Another way of looking at how the budget is divided is by looking at where the money is spent.

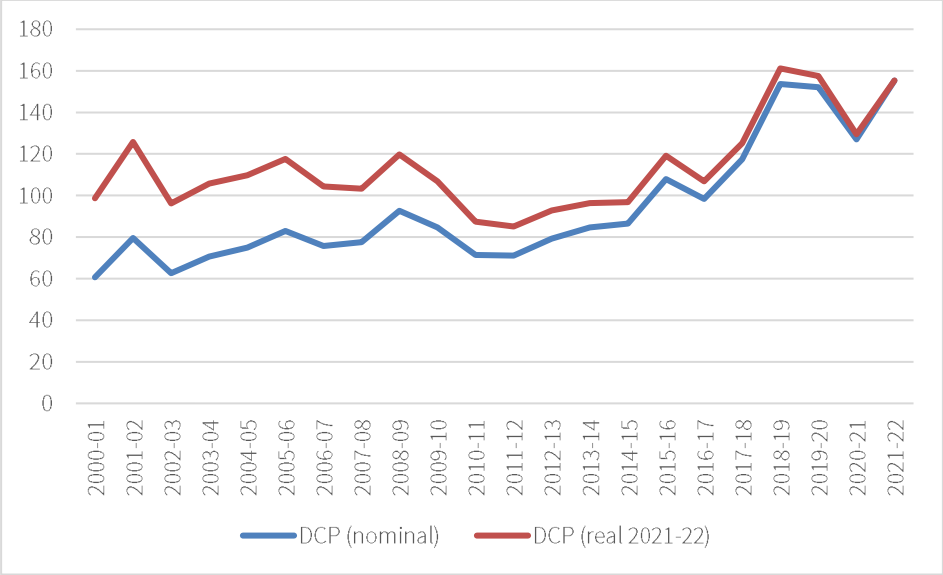
Defence Cooperation Program

PBS Appendix A (page 110) covers the Defence Cooperation Program (DCP), which is Defence's own regional aid program aimed at developing Defence's relationships with South Pacific and Southeast Asian security forces and enhancing their capacity. It's not necessarily a lot of money by Defence's standards (less than 0.5% of the total budget), but it makes a big difference to regional forces, particularly in Papua New Guinea (PNG) and the South Pacific.

After a long period of being essentially stagnant or declining in real terms, the DCP's budget has been growing rapidly over recent years (Figure 3.8). This has been driven by, among other things, the Pacific Maritime Security Program, the centrepiece of which is the replacement patrol boat program. The 21 Guardian patrol boats for South Pacific nations and Timor-Leste are being constructed by Austal in Henderson in Western Australia (so a lot of the money is being spent here in Australia, not in the South Pacific).

However, the DCP's spend shrank sharply in 2020–21. This was due not to a reduction in funding but to the impact of Covid-19. In the 2020–21 PBS, Defence was aiming for a further big increase to $177.7 million but managed only $127.0 million. The target for 2021–22 is $155.3 million, which is about where the program was before Covid-19 hit.

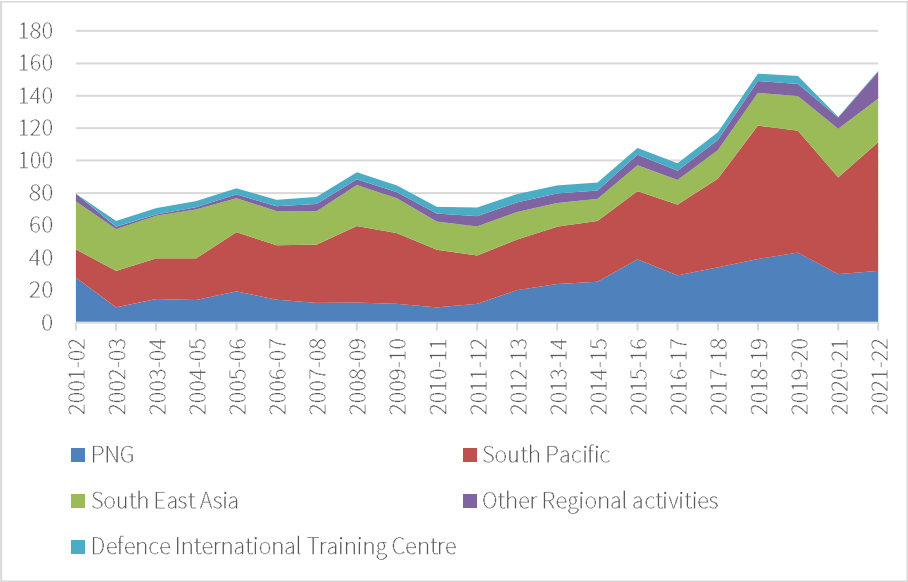
Figure 3.8: Defence Capability Plan budget, 2000–01 to 2021–22 ($ million)



Note: The DCP doesn't provide figures for the forward estimates but only for the budget year.
Source: PBS.

Figure 3.9 shows the breakdown, by area. As a region, the South Pacific is the largest recipient overall, but PNG is the largest single recipient country. The PBS indicates that the Papua New Guinea funding line includes work on the Lombrum naval base on Manus Island. (PBS tables 52 and 53 provide a breakdown by country for this year.)

Figure 3.9: Defence Cooperation Program, by recipient, 2001–02 to 2021–22 ($ million)



Source: PBS.

How much is Defence's part of the Pacific Step-up?

The government announced the Pacific Step-up on 8 November 2018.[57] Defence is playing a large role in the step-up but it's not clear what that's costing. Let's try to unpack that.

The original announcement referred to a range of measures across government, including the Defence Department, designed to strengthen Australia's relationship with Pacific island countries and enhance their sovereignty and resilience. At the time, no budget was announced for the Defence Department measures.

The first coverage of Pacific Step-up in budget papers was the Mid-Year Economic and Fiscal Outlook (MYEFO) released in December 2018. It outlined measures across government that contributed to the step-up. Defence's measures included:

- building defence interoperability with partner nations in the Pacific to respond to common security and humanitarian challenges
- a joint initiative with the defence forces of PNG and the US at the PNG Defence Force's Lombrum Naval Base in Manus Province
- the redevelopment of Fiji's Blackrock Peacekeeping and Humanitarian Assistance and Disaster Relief Camp.[58]

The original October 2018 announcement also referred to a new ADF Pacific Mobile Training Team as well as 'a dedicated vessel to deliver support to our partners in the Pacific, including for humanitarian assistance and response'. This vessel has at various times been described as 'large hulled', and, while it wasn't going to be based in the South Pacific, it would spend most of its time operating there.

But, while the MYEFO update outlined the funding attached to various measures across government, it didn't provide numbers for Defence, either for individual measures or for their aggregated total. The budget measures table in Defence's PAES 2018–19 included a line under the title 'Defence increased engagement in the Southwest

Pacific'. It gave no figures, and a note stated that 'The expenditure for this measure is not for publication due to national security sensitivities, and includes expenditure to be absorbed by Defence.'[59] It didn't explain why a measure aimed at increasing the resilience and sovereignty of South Pacific countries is so sensitive that revealing its cost would undermine Australia's security. One would think advertising the spend would support the DSU's new emphasis on 'shaping' the region.

So, how much is the Pacific Step-up costing Defence? Without it being stated in the Budget papers, it's difficult to say. One point is clear: Defence has consistently told the Senate that it didn't receive any additional funding for the step-up and had to find the funding within its existing allocation by reprioritising existing plans.[60] But that still leaves the question of how much funding Defence needed to find.

The only public reference to the total cost of Defence's share of the Pacific Step-up that we can find was made at Senate estimates hearings on 26 October 2020, when Defence stated that the step-up was funded at $400 million over five years from 2018–19 (that is, to 2022–23).[61] Is that a credible number?

The South Pacific region is the largest element of the DCP. There is also a separate line for the program in PNG, which is the largest individual country involved. If we look at the DCP over recent years, there does appear to be a big increase in 2018–19 (see Table 3.7). However, that was driven by the start of the Pacific Patrol Boat Replacement Project—a roughly $500 million program providing new patrol boats to Pacific island countries, PNG and Timor-Leste. That increase was already included in the 2018–19 PBS and predates the Pacific Step-up announcement, so it shouldn't count towards the $400 million.

The DCP section of the PAES also stated that that 'no changes have been made to the Defence Cooperation Program since the PBS 2018–19', suggesting that no increased spending associated with the step-up occurred in 2018–19. If the step-up is funded at $400 million, it would need to show up at an average increase of around $100 million per year from 2019–20 in the South Pacific region line. There's little sign of that so far.

Table 3.7: Defence Cooperation Program funding, 2017–18 to 2021–22 ($ million)

	2017–18	2018–19	2019–20	2020–21[a]	2021–22
Papua New Guinea	34.1	39.2	43.2	30.0 (48.5)	31.9
South Pacific Region	54.7	82.3	75.2	59.6 (82.5)	79.4
Total DCP	**117.5**	**153.6**	**152.1**	**127.0 (177.7)**	**155.3**

Note: Columns do not sum, as not all DCP elements are included.

a Numbers in parentheses for 2020–21 were the original target. The numbers outside the parentheses are the actual result, which reflects the impact of Covid-19.

Source: Defence PBS.

Pacific Step-up activities might be funded from other parts of the Defence budget, such as Program 1.1: Operations Contributing to the Security of the Immediate Region, but that line is only around $11 million from 2019–20 to 2022–23.

A big chunk of the $400 million could be related to the Pacific support vessel. The FSP budgets the vessel at $180–280 million. However, as of 11 December 2020, there had still been no decision on the large-hulled humanitarian vessel. Defence stated it was developing options for government consideration in 2021. Since the FSP states that the vessel will be built in Australia and construction won't start for some time, it's unlikely that much of $180–280 million will be spent by 2022–23.[62]

Overall, the $400 million figure looks more like the DCP's *entire* South Pacific program for the five years from 2018–19 to 2022–23, rather than the *additional* funding relating to the Pacific Step-up. It's an issue that could be usefully explored by the Senate or, better yet, reported by Defence to the Parliament.

The 2020–21 Budget contained a further Pacific Step-up initiative called 'Pacific Step-Up — delivering security infrastructure in the Southwest Pacific' to build a border and patrol boat outpost in Solomon Islands' western provinces. The Budget papers stated that the total cost was $124.3 million.[63] Defence has since provided the annual breakdown of the measure to the Senate. While the budget papers state that it's an expansion of existing step-up measures, it wasn't an expansion of funding, since the cost would be met 'from within the existing resources of the Department of Defence'. This was confirmed at Senate estimates hearing on 27 October 2020, when Defence officials stated that it would be covered by the original funding intended for the Pacific Step-up. That is, there was sufficient unspent funds from the original step-up to cover a new $124.3 million project.

In short, while the original intent was $400 million to be covered by Defence's existing funding, there's no way to determine from the public documents how much has actually been spent, and what the spending plan for future years looks like.

By state and territory

Defence doesn't publish a holistic overview of where its spend goes by state and territory. Some information accompanied the DSU in the form of a large number of media releases, which ASPI has aggregated and published in Part 1 of 2020–21's *The cost of Defence*.[64] However, the PBS breaks spending by each facilities project down by electorate and state or territory. Table 3.8 sums the spend by state and territory.

Table 3.8: Planned Defence capital facilities spend, by state or territory, 2021–22 ($ million)

	NSW	Vic.	Qld	SA	WA	Tas.	NT	ACT	Total
Facilities capital spend	186.4	220.1	151.8	122.5	176.8	10.4	296.0	32.0	1,196
% of total	15.6%	18.4%	12.7%	10.2%	14.8%	0.9%	24.7%	2.7%	100.0%

Source: PBS 2021–22, Table 56.

This year's biggest spend is in the Northern Territory. And there's more work coming to the Northern Territory in the business case for an additional $747.0 million on training ranges under the US Force Posture Initiative, currently before the Parliamentary Standing Committee on Public Works for final approval.

> **Business cases for Defence's large infrastructure projects are on the Parliamentary Standing Committee on Public Works' web page.**[65]

Local versus overseas spending

Defence provides ASPI with a breakdown between local and overseas spending for its military equipment acquisition and sustainment programs (that is, the programs administered by Capability Acquisition and Sustainment Group). We've updated Table 3.9 with Defence's figures for 2020–21 and its estimated numbers for 2021–22.

Table 3.9: Capability Acquisition and Sustainment Group, local and overseas spending, 2012–13 to 2021–22 ($ million)

	Acquisition			Sustainment		
	Local	Overseas	Total	Local	Overseas	Total
2012–13	1,515	1,946	3,461	3,346	1,224	4,570
	44%	56%		73%	27%	
2013–14	1,604	2,669	4,273	3,218	1,407	4,625
	38%	62%		70%	30%	
2014–15	1,648	4,926	6,574	3,536	1,482	5,018
	25%	75%		70%	30%	
2015–16	1,989	4,436	6,426	3,852	2,097	5,949
	31%	69%		65%	35%	
2016–17	2,120	4,152	6,272	3,891	1,706	5,597
	34%	66%		70%	30%	
2017–18	2,453	4,855	7,308	3,863	2,118	5,982
	34%	66%		65%	35%	
2018–19	2,456	5,555	8,011	4,288	2,482	6,770
	38%	62%		69%	31%	
2019–20	2,617	5,360	7,977	4,359	2,629	6,988
	33%	67%		62%	38%	
2020–21	3,535	5,739	9,274	5,245	2,411	7,656
	38%	62%		69%	31%	
2021–22	3,893	5,461	9,355	5,140	2,373	7,513
	42%	58%		68%	32%	
Total	**23,830**	**45,099**	**68,929**	**40,738**	**19,929**	**60,667**
	33%	**67%**		**67%**	**33%**	

Source: Defence data.

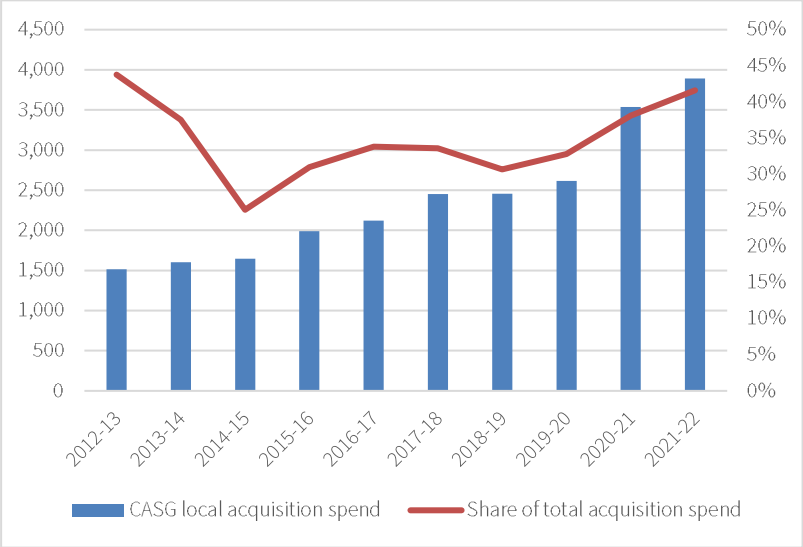
It's a very good news story in the acquisition space: Australian defence industry boosted its performance in 2020–21 by 35%, growing by $918 million to over $3.5 billion. That's a remarkable achievement, particularly in the middle of a pandemic. In addition to achieving increased absolute spending, local industry achieved an increased relative spend, growing from 33% to 38% of the total acquisition spend. Defence is forecasting both the absolute and relative increases to continue into this year. Local industry also did well on the sustainment side last year, increasing both its absolute spend and its share of the total sustainment budget.

We suggested in Part 1 of *The cost of Defence* in 2020 that, as the overall defence budget grows over the coming decade, and with the acquisition budget's share planned to grow to 40% of the total, Australian defence industry will need to eat a very large elephant, particularly if the government wants to grow Australian industry's share beyond its 'traditional' one-third of the acquisition budget. Those compounding factors could increase the local acquisition spend on equipment from $2.6 billion in 2019–20 to around $10 billion by the end of the decade.

While Australian industry spend has grown in absolute terms, it was stuck at around one-third of the total for some time, despite the policy settings put in place in the government's 2016 Defence Industry Policy Statement and subsequent policy documents (Figure 3.10). We now appear to be seeing Australian industry growing

beyond that share. There's still a long way to go to get to $10 billion, but there are positive signs that Australian defence industry is learning how to eat elephants.

Figure 3.10: Australian industry's share of Defence's equipment acquisition spend, 2012–13 to 2021–22 ($ million)



Source: Defence data reproduced in Table 3.9.

Chapter 4: How is the delivery of capability going?

Key points

- While the raw numbers in successive PBSs suggest that Defence may be significantly underspending its acquisition budget, actual achievement has probably been close to plans once all measures and adjustments are taken into account—with the exception of 2020–21.
- The government's $1 billion in Covid-19 economic assistance measures from the defence budget essentially reassigned and/or accelerated funds that would have otherwise gone unspent. It's hard to tell what impact they had either on industry or the delivery of capability, but they are likely to have played some role in Defence achieving a record spend in 2020–21.
- Defence continues to suffer serious problems in the delivery of projects—the cancellation of the Submarine Escape Rescue and Abandonment replacement and the indefinite halt to the Army's battle management system being the most striking examples in the past year.
- The projected spend for the naval shipbuilding enterprise approaches $2.5 billion, but it's still got a long way to go before it peaks.

The previous two chapters looked at how much money the government is spending on capability. This chapter looks at what it's getting for the money. ASPI provided an update on the delivery of Defence's acquisition program in Part 2 of 2020–21's *The cost of Defence*, which appeared in October last year. That's only seven months ago, but enough has happened since then to justify another update.

We draw on a range of sources including:

- the *Major projects report* (MPR) published by the Australian National Audit Office (ANAO) but including project management information drawn directly from Defence—the most recent edition is the 2019–20 one
- the top 30 acquisition projects and sustainment products in the PBS and PAES (and actual spends reported in the Defence Department's annual report)
- parliamentary committee hearings, particularly Senate estimates, and Defence's written responses to committee questions (which can hold some hidden gems)
- Defence documents released under freedom of information requests, such as Capability Acquisition and Sustainment Group's quarterly performance reports
- media articles in both mainstream publications and specialist defence media
- ASPI's Cost of Defence database, which compiles publicly available data.

In the previous edition of *The cost of Defence*, we spent some time examining the timeless question of whether Defence projects consistently go over budget. The next time you see a media story claiming they do, we'd recommend you revisit Section 3.1 of that edition for some context.

This year, we start by exploring the topical issue of whether Defence is underspending its acquisition budget. We then look at Defence's Covid-19 spending measures before we get into individual capabilities. We give their acquisition and/or sustainment spends for 2021–22 (in A$ millions) where they are public. As noted earlier, the PBS now includes 'Other project inputs to capability' as well as spending on military equipment, so we show that too.

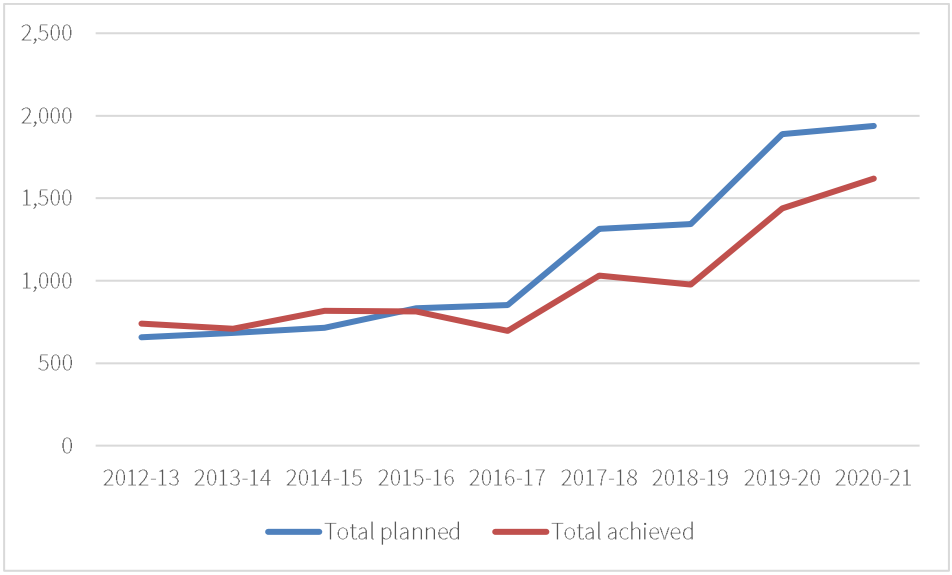
4.1 Is Defence underspending its acquisition budget?

The conspiracy of optimism

To understand underspending in the acquisition program, we need to distinguish between underspending at the project level and at the program level. Every year when Defence develops its budget for the coming year, every project in Defence works out what it thinks it will spend in the coming year. Most of them miss their target. ASPI has spending data for Defence's biggest projects over the past 22 years. Over that time, 74% of projects have underspent their in-year target. They've missed in aggregate by $9.4 billion, even after we net underperformance off against the projects that have overspent. But it's not the case that Defence has received $9.4 billion less capability; those funds roll into future years and eventually get spent.[66]

Here's an illustration of that in the shipbuilding program over the past decade. We can see that the gap between planned and achieved spending has grown (Figure 4.1). That's because for the first half of the decade virtually the only project was the air warfare destroyer, which was up and running and was sorting out the serious problems it had encountered in turning design into production. Significant underspends tend to occur when projects are starting out and risks are often large and not necessarily well understood—as is illustrated in the past five years of the shipbuilding program.

Figure. 4.1: Underspends in the National Naval Shipbuilding Enterprise, 2012–13 to 2020–21 ($ million)



Sources: Defence annual reports, PBS.

There are many reasons why it happens. It's not necessarily poor planning. It's been described as the conspiracy of optimism. It's not necessarily a bad thing. You want your project managers to be ambitious and deliver quickly. It's just that reality often intervenes.

The concept of slippage

How does Defence deal with this reality? If it simply took every project's cash flow estimate for the coming year and added them up and said that was its acquisition budget, it would get to the end of year with a lot of unspent money on its hands—money that could potentially go back into consolidated revenue and never deliver capability.

So Defence uses the concept of slippage to manage that risk. Essentially, it aggregates all of its individual projects' planned cash flows and applies a 'management margin' called slippage that assumes an average level of underperformance. But that means Defence can over-program by a corresponding amount. For example, if you have $1 billion to spend and think 10% slippage at the program level is about right, then you can program nearly $1.1 billion in projects and deliver $1 billion in capability. But if you only program $1 billion, you'll only spend $900 million and $100 million in capability will be lost. Defence's estimate for its acquisition spend once it has applied the slippage margin is in PBS Table 5.

You can work out what level of slippage Defence is applying to the military equipment program from the numbers at the end of the Top 30 table in the PBS (this year it's PBS Table 54). The number has varied over time. Generally, a higher slippage factor indicates greater uncertainty. In 2016–17, it was 14.2%. In 2019–20, it was 17%. Surprising, in the 2020–21 budget, it was a rather low 11.5%, despite us being well into the Covid-19 pandemic when the budget was released. It's not surprising then that the program ended up significantly underspending. This year, the slippage factor is 20%, suggesting a high level of uncertainty, which is probably appropriate.[67]

Defence also applies slippage when projects receive Gate 2 ('second pass', in the old terminology) approval from government. While the full project budget approved by government is transferred from the unapproved program to the approved program, a slippage factor is applied to the funding, particularly to the early years to address the historical fact that projects tend to underspend most in their early years.

You might wonder whether this is some kind of Ponzi scheme. Isn't Defence progressing more projects than it can afford? What happens if all of Defence's projects manage to spend what they were planning to spend? Won't it be short of cash? That's a theoretical possibility, but so far it shows little sign of occurring in the real world.

Underspending at the program level

So Defence's estimate for its acquisition program already incorporates processes that compensate for the historical fact of individual project underperformance. Let's now look at whether Defence underspends at the program level; that is, whether it misses its acquisition target in PBS Table 5. ASPI first looked at this issue in the 2018–19 edition of *The cost of Defence*. Since then, the topic has come up several times at Senate estimates hearings. In short, the raw numbers presented in the PBS seem to indicate that since the 2016 DWP Defence has underspent against its acquisition target. But is that actually the case? Or is it only an apparent issue that can be explained by other factors?

Here's the raw data (to enable an apples-to apples-comparison, we've stripped out the category 'Other investment', which Defence removed from the acquisition program in the 2018–19 PBS). If you read across the rows in Table 4.1, you see the planned acquisition spend predicted in each year's PBS. If you read down the columns, you can see how the plan for each year changed over time, with the blue square showing actual achieved performance.[68]

Table 4.1: Defence acquisition program, 2016–17 to 2024–25 ($ million)

	2016–17	2017–18	2018–19	2019–20	2020–21	2021–22	2022–23	2023–24	2024–25
PBS 2016–17	9,909	10,702	12,293	13,512					
PBS 2017–18	9,152	10,416	11,743	13,072	15,628				
PBS 2018–19		9,733	11,025	12,331	14,268	16,497			
PBS 2019–20			10,944	11,768	14,337	16,970	19,035		
PBS 2020–21				11,212	14,281	16,807	18,766	20,598	
PBS 2021–22					12,659	15,766	17,805	19,555	20,129

Sources: PBS, PAES.

Scanning down the columns, it does appear that targets have progressively been revised downwards. For example, the target for 2019–20 in the 2016–17 PBS was $13,512 million. It was revised downwards each year until a final actual achievement of $11,212 million. If we compare the original estimate in Table 4.1 with actual achievement, it looks like this (Table 4.2):

Table 4.2: Apparent shortfalls in Defence's acquisition program, 2016–17 to 2020–21 ($ million)

	2016–17	2017–18	2018–19	2019–20	2020–21	Total
Original estimate	9,909	10,702	12,293	13,512	15,628	62,044
Achievement	9,152	9,733	10,944	11,212	12,659	53,700
Shortfall	-757	-969	-1,349	-2,300	-2,969	-8,344

Sources: PBS, PAES.

It's been difficult to identify what's been driving that. Since ASPI only had visibility of foreign exchange variations, which don't come close to covering the whole shortfall, we've previously suggested that there could have been a significant underspend of the acquisition budget. However, in response to questioning at several Senate estimates hearings, Defence has now listed all of the adjustments that affected the acquisition budget between 2016–17 and 2019–20.[69]

Defence has stated that the shortfall is $5.17 billion in those years. Table 4.2 puts it at $5.38 billion (the difference is most likely due to the pesky 'Other investment' category, but we're close enough). Table 4.3 is an aggregated list of adjustments to the program that Defence has provided to the Senate.

Table 4.3: Adjustment to Defence acquisition funding, 2016–17 to 2019–20 ($ million)

Adjustment	Value
No win, no loss foreign exchange adjustment	1,151
PFAS remediation	566
Military employee expenses (i.e., transfer to personnel budget)	560

Adjustment	Value
Transfer from ICT capital to ICT sustainment	465
Redress for Survivors of Institutional Child Sexual Abuse	165
Transfer to ASD as part of establishment of ASD as a statutory agency	390
Changes to Defence Property Disposal Plan (i.e., additional funding allowing reduction to top level budget)	338
Classified activities	208
Transfers to operating as part of project approvals	162
Subtotal	***4,005***
Movement in capital across years	1,168
Total	**5,173**

Source: Defence responses to Senate estimates questions on notice.

Those adjustments sum to Defence's $5.17 billion figure. Of that, $4 billion are adjustments to funding due to measures such as foreign exchange adjustments or meeting new priorities such as PFAS remediation. One can argue about whether those priorities should have been met from the acquisition program rather than another part of the budget, but they aren't under-delivery *per se*. That leaves around $1.17 billion in what Defence terms 'movement in capital across years'. That does seem to be in the category of money that Defence was unable to spend, so it got shuffled into future years.

In short, once all adjustments over the four years following the 2016 DWP are taken into account, Defence appears to have underspent by a little more than $1 billion. In that time, it's managed to spend $41 billion. That's a pretty good achievement.

As we've discussed in previous chapters, the situation with 2020–21 is a little different. There, once we take all adjustments like foreign exchange into account, Defence does appear to have underspent by around $1 billion in that year alone. Nevertheless, it still managed to set spending records in its acquisition programs despite Covid-19.

Here's another way of looking at whether Defence is managing to spend. In 2015–16, the last year before the 2016 DWP, Defence spent $8,225 million in its acquisition program. In the five years since then, it has spent on average $2.5 billion more per year than that starting point, for a total of an additional $12.5 billion.

4.2 The Defence budget and Covid-19

We noted that Defence received $136.2 million in supplementation for Operation Covid-19 Assist in 2020–21. It gets another $0.2 million this year, but, other than that, there's no more supplementation and it has to fund further activities in that operation out of its existing funding.

The government also made several announcements last year about measures drawing on the Defence budget to promote economic recovery. On 27 March 2020, it announced that it was 'fast-tracking' $500 million in payments to defence industry. The effect was that 'some suppliers will receive payments up to two weeks earlier than

usual.' It's hard to assess the real-world impact of this; cash flow is certainly important for businesses, but 'some suppliers' and 'up to' two weeks are pretty vague.

On 26 August 2020, the government stated that it had 'fast-tracked a range of capability, infrastructure, skilling and workforce initiatives over the next two years' and that 'over $11 billion has already been provided in early payment for invoices and work to improve or sustain industry capacity for the delivery of critical supplies.' At the same time, it announced a '$1 billion investment package to boost Australia's defence industry and support thousands of jobs across the country'.[70] The announcement listed a range of measures, which were fleshed out by Defence in a response to a question at Senate estimates in October 2020.

We can make two (linked) observations about the measures. The first is that they had a general theme of 'accelerating' or 'bringing forward' activities that were already planned. The second is that, unlike many of the government's Covid-19 relief measures, there was no new money here. Defence informed the Senate:

> Defence will fund the package by absorbing the $1 billion over two years from 2020–21 to 2021–22 from within the Defence annual budget through the application of risk management strategies and reprioritisation from some categories of expenditure based on reduced activity levels as a result of Covid-19. Such impacts include for example reduced military postings, military training activities, fuel expenditure, domestic and international business travel, and international infrastructure and engagement programs.[71]

That last one is a reference to the sharp drop in spending in the Defence Cooperation Program we discussed in Chapter 3. In essence, Defence saw that it would underspend and looked around to see where it could spend quickly. It may not be new money, but adjusting your plans to make sure you can spend your budget while delivering capability and supporting local industry is good management.

It's hard to say, though, how much of the $1 billion has been spent. One measure was to increase ADF Reserve hours by 210,000 days (roughly analogous to 1,000 full-time equivalents), although much of that was probably happening anyway to conduct Operation Covid-19 Assist. If we compare the 2019–20 PBS plan for Reserve days for 2020–21 to 2022–23 with the 2020–21 PBS's plan for those years, there is indeed an increase of a little over 200,000 days. And Defence did achieve an additional 113,060 just in 2020–21.

Other than that, it's difficult to tell. Perhaps the best evidence that it did make a difference in keeping projects moving is that, despite the pandemic, Defence achieved record spends in both its military equipment and its infrastructure acquisition programs.

4.3 Maritime capability

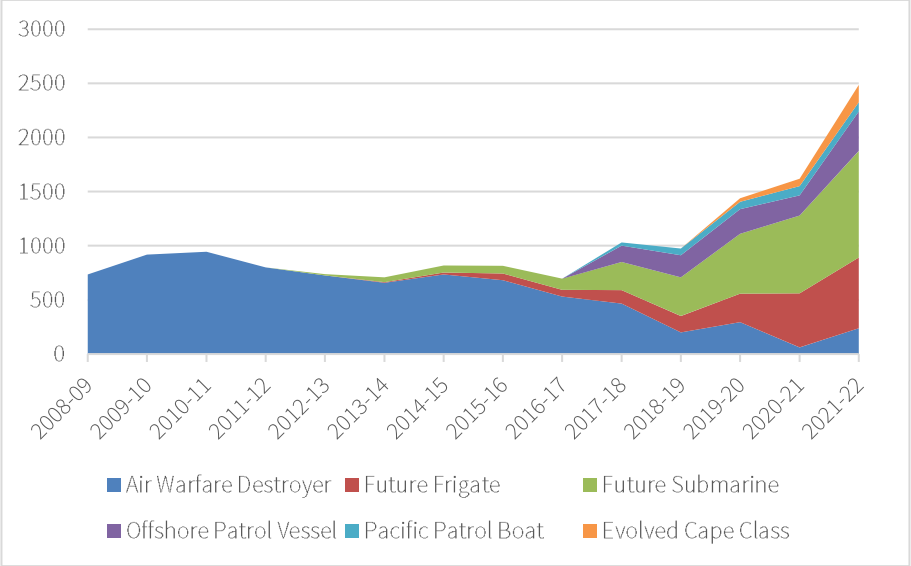
The Naval Shipbuilding Enterprise

The Naval Shipbuilding Program continues to ramp up, although perhaps not as quickly as the government and Defence might like (Figure 4.1 and Figure 4.2). In 2020–21, the program was forecast to spend $1,938 million but achieved $1,619 million. This year, it's aiming for a big jump of 54% to $2,486 million (not including other project inputs to capability).[72] The Future Frigate Program has started 'prototyping', so work is starting to move from design to construction, but there's still a long way to go before it reaches its maximum spend. The future submarine is even further away. Our earlier estimate of a mature steady-state spend of around $3.5–4 billion per year for the shipbuilding program is starting to look underdone. That's before we roll in the new projects announced in the FSP that will also be built in Australia.

The big three shipbuilding programs—future submarines, future frigates and offshore patrol vessels (OPVs)—are all now reported on in the ANAO MPR, which is a huge step forward for transparency and public understanding of

the risks and issues in the projects. The government has also stated that it will release an updated Naval Shipbuilding Plan this year. It's been four years since the first one, so there are a lot of developments to incorporate.

Figure 4.2: Naval Shipbuilding Plan cash flow, 2008–09 to 2021–22 ($ million)



Sources: Defence annual reports, PBS

SEA 1180: Arafura-class offshore patrol vessel

Offshore patrol vessel	Total approved budget	Spend to 30 June 2021	Achieved spend in 2020–21	Planned spend in 2021–22
Equipment	3,670	795	186	366
Other project inputs to capability	981	65	–	128

The OPV project continues to make good progress (four vessels are under construction), although the pandemic appears to have had some impact on the 2020–21 spend. The 2019–20 ANAO MPR states that the first vessel is to be delivered in December 2021 for test and evaluation, followed by initial operational capability in December 2022. It's not clear whether the pandemic has affected that.

The project has a substantial 'Other project inputs to capability' line, most of which is infrastructure (from the $918.8 million line in PBS Table 56). That's cleared the Parliamentary Works Committee, and work is starting.

Figure 4.3: OPV *Arafura*'s mast is lifted into place on top of the ship's bridge

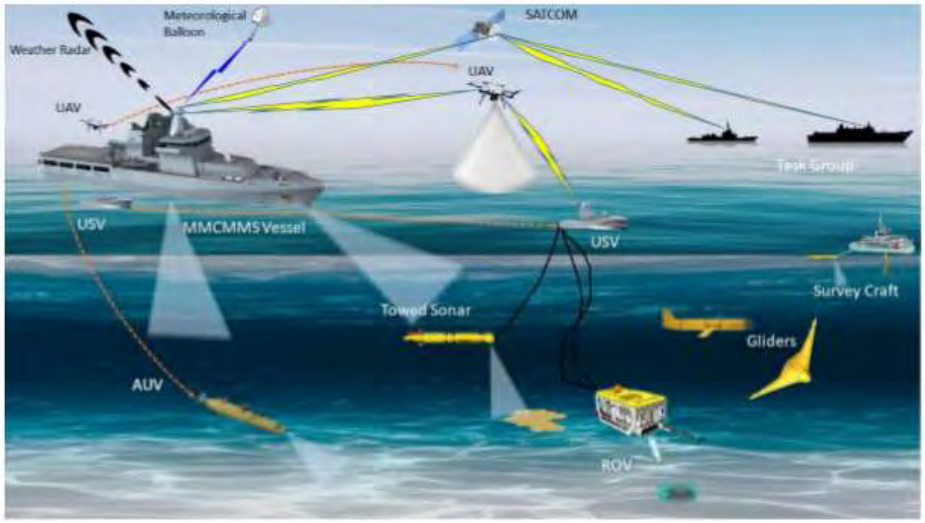
Source: Defence image library, online.

SEA 1905: Maritime Mine Countermeasures and Military Survey Capability

During the 2019 election campaign, the government announced that it wasn't going to carry out an expensive upgrade to the fleet of minehunters but would instead replace them with a suite of remotely operated and autonomous systems on new vessels. The FSP contained a $3.3–5 billion provision for future mine warfare and hydrographic vessels.

Since then, it's been announced that the vessels will be based on the OPVs.[73] An indicative number of eight has been stated. The program has been split into two phases. A tender has been released for the first phase, which is the systems to be carried on the vessels. A tender for the vessels themselves is yet to be released.

Figure 4.4: The Maritime Mine Countermeasures and Military Survey capability and exemplar systems



Sources: Defence request for tender documents.

SEA 5000: Hunter-class frigate

Hunter-class frigate	Total approved budget	Spend to 30 June 2021	Achieved spend in 2020–21	Planned spend in 2021–22
Equipment	6,047	1,209	508	655
Other project inputs to capability	1,011	110	–	116

While the approved funding for the frigate program is now around $6 billion, the total provision grew to $45 billion in the FSP (from $30 billion and then $35 billion). Defence released a high-level master schedule in response to a Senate estimates question showing that delivery of the first ship is scheduled for late 2029; initial operating capability (IOC) is scheduled for late 2031 after a two-year work-up.[74]

The good news is that the program commenced on schedule in December 2020, although that seems to be more about proving the shipyard than ship construction *per se*. The bad news is that the project is now on Defence's 'projects of interest' list. Capability Acquisition and Sustainment Group's February 2021 report (released under FOI) states why. It's a clear, obfuscation-free explanation that's worth quoting in full:

> The Project was listed as Project of Interest in March 2020 due to size, complexity, risk profile, and media interest. There currently no key issues without remediation. The Project is operating with a challenging schedule, which will need to be further assessed in light of COVID-19 restrictions. Senior management oversight will be continuously warranted.
>
> Despite the realisation of risks related to the delay of some programmatic milestones, prototyping commenced on 18 December. Commencement of Ship 1 construction in December 2022 also remains on track, however, [redacted].
>
> Defence continues to work with BAE Systems Maritime on managing risks and associated impacts to the project. However, some of the impacts associated with the issues identified above may yet be further exacerbated by the effects of the COVID-19 pandemic …
>
> As expected in a large complex project, there are a number of issues that are currently being managed by Defence in addition to COVID-19 disruptions. These include BAE Systems Maritime Australia's schedule maturity, United Kingdom Type 26 Frigate [that is, the reference design for the Hunter] weight increases with consequential impact on Hunter Class weight, Type 26 design backlog, and information exchange issues …
>
> It may not be possible to completely ameliorate the impacts on the schedule, which are being further challenged by COVID-19 restrictions in the United Kingdom design team.[75]

SEA 4000: Hobart-class air warfare destroyer

Air warfare destroyer	Total approved budget	Spend to 30 June 2021	Achieved spend in 2020–21	Planned spend in 2021–22
Equipment	9,094	8,147	62	238
Other project inputs to capability	–	–	–	–

2020–21 sustainment	2021–22 sustainment
259	211

Full operational capability is likely to be declared very soon for the Hobart class; the third vessel, HMAS *Sydney*, recently completed combat system trials. The project is seeking program closure in 2021–22, bringing to an end a project that got second-pass approval in 2007. It's been one of the more controversial projects in recent history, but, whatever your views on it, it has delivered what it was asked to. The estimated sustainment cost has come down from last year, which we might hope indicates that the sustainment system is maturing.

Submarine Escape, Rescue and Abandonment System

Defence entered into contract with Phoenix International Australia on 19 December 2018 for a submarine rescue system. A year later, the project was facing delays to the systems design review, and by mid-2020 its schedule was assessed as red and its cost as amber. It was declared a 'project of interest' in June 2020.[76]

Defence announced that the government had cancelled the Submarine Escape, Rescue and Abandonment System contract with Phoenix International Australia on 21 January 2021.[77] Defence's February 2021 quarterly report to government on projects and sustainment stated that the project 'has experienced a range of issues that have delayed exit from the System Definition Review', but didn't state what those issues were.[78] At Senate estimates in March this year, Defence officials stated that there 'were delays in getting through mandated systems review—the systems definition review, in particular.' Defence also stated that the members of the Naval Shipbuilding Advisory Board had conducted a review and concluded that:

> … a material difference was identified in the interpretation and expectations between Defence and Phoenix that were compromising the execution of the project and contributing to the ongoing delays. That material difference was seen as also getting us to a position where it was preferable to terminate [the contract] by mutual agreement rather than endeavouring to try to deliver the project.[79]

The project had a total approved budget of $380 million. According to the 2020–21 PAES, total expenditure to 30 June 2020 was $70 million, and another $87 million was estimated for 2020–21. For that, the government has received some design work for a system that won't be delivered and some kind of a facility in Western Australia. It seems very strange that the two parties could have contracted for something they had such different understandings of and spent around $100 million before they realised they weren't on the same page. As Senator Patrick put it, 'How did you get so far into a contract without realising there is such a delta?' Perhaps the best that can be said about it is that Defence and industry decided to part ways relatively quickly.

The tragic loss of the Indonesian submarine KRI *Nanggala* in April 2021 highlights the dangers inherent in operating submarines. Defence's cancellation announcement stated that it 'retains a suitable submarine rescue system supporting the Collins class submarines under an existing contract with James Fisher Defence Australia. This system can be sustained into the late 2020s.'

SEA 1000: Attack-class submarine

Attack-class submarine	Total approved budget	Spend to 30 June 2021	Achieved spend in 2020–21	Planned spend in 2021–22
Equipment	5,818	2,041	719	982
Other project inputs to capability	537	238	-	64

Where to start? It's probably a topic for more considered treatment another day. The spending keeps ramping up, and $2 billion has been spent already. Over $1 billion is planned for this year. It will likely be $20 billion by the time the first boat is operational in 2034.

Collins-class submarines

Collins Satellite Communications	Total approved budget	Spend to 30 June 2021	Achieved spend in 2020–21	Planned spend in 2021–22
Equipment	441	60	?	97
Other project inputs to capability	28	8	?	4

2020–21 sustainment	2021–22 sustainment
661	671

Collins sustainment once again tops the sustainment Top 30 at $671 million, but it's hard to determine the full cost of the capability. While the cost of full- and mid-cycle dockings is included in the sustainment spend, the capability upgrades installed during those dockings are covered by separate acquisition projects, not all of which make it into the Top 30. It's odd, for example, that the Collins sonar upgrade has fallen out of the Top 30 (it's not in the ANAO MPR either). Last year, it spent $133 million, and it still has a long way to go. Similarly, the Collins communications and electronic warfare improvement program is spending a lot, based on the ANAO MPR, but doesn't make the cut-off. The only Collins project in the Top 30 this year is the Collins satellite communications upgrade, at $101 million. If we include sustainment, upgrade projects and weapons, the annual cost probably comes close to $1 billion.

To that, we'll need to add the cost of the Collins life-of-type extension (LOTE), whose spending has started. The LOTE appeared in the FSP with a provision of $3.5–6.0 billion. Considering that Defence's philosophy is to maintain the boats at a 'regionally superior' level of capability and that it appears to be planning on replacing

the main motor, diesel generators, electrical distribution system and other key systems such as periscopes, the upper end of that band would seem to be a minimum.

Anzac-class frigates

2020–21 sustainment	2021–22 sustainment
375	338

We have a similar problem with the Anzac frigates to the one we have with Collins class in determining the total cost of ownership—the sustainment cost doesn't include capability upgrades that are being delivered by acquisition projects. At times, those projects have cracked the Top 30, but none makes the cut this year. The ANAO's MPR does include the Anzacs' radar upgrades. There's likely to be at least another $100 million a year on top of the sustainment.

The Anzac-class frigate HMAS *Perth* went into drydock for upgrades in December 2016. Due to the lack of crew, it won't be back in the water and in service again until the second quarter of 2022. That means it will be out of service for five years.

SEA 1300: Navy guided weapons subprogram

	Total approved budget	Spend to 30 June 2021	Achieved spend in 2020–21	Planned spend in 2021–22
Equipment	2,022	629	208	210
Other project inputs to capability	35	1	–	2

The Navy rolled its weapons projects into one 'sub-program'. That makes sense from an enterprise management perspective, but it makes it even harder to see what's going on from the outside. I attempted to unpack it in an article in *The Strategist* earlier this year.[80] The total approved budget is the tip of a coming iceberg, based on the figures for future naval guided weapons in the FSP ($16.1–24.2 billion).

SEA 1654: Maritime operational support capability

Despite some Covid-19-induced delays, HMAS *Supply* was commissioned in April 2021. Its sister ship, *Stalwart*, has commenced sea trials and will be commissioned next year. The two vessels are a step up in capability. The project is no longer in the Top 30, but it will be delivered well within budget. Incidentally, seven of the Navy's eight largest ships will be Navantia designs.

These could be the Navy's last overseas-built ships for some time. The DSU seems to suggest that all ships will be built in Australia, including very large ones, such as the two sealift and replenishment vessels that could be even larger than the Supply class.

Other maritime capabilities

The Pacific Patrol Boat Replacement project (SEA 3036 Phase 1) is no longer in the Top 30. That's not because it's completed its 21 patrol boats but because its spend is too low. Deliveries will continue to 2023.

At Senate estimates, Defence reported that the new Evolved Cape class patrol boats being built by Austal have suffered delays due to an unusable batch of aluminium. Somewhat ironically, it was supplied by China, as there's no ability to manufacture it in Australia—yet another illustration of the extent of the supply-chain risks we face.

4.4 Land capabilities

We noted last year that land vehicles are officially big business. That's still the case: the Boxer and Hawkei are planned to be Defence's fourth and fifth biggest spenders this year. Vehicles will continue to be big business—as truck projects deliver and ramp down, armoured vehicle projects will ramp up.

LAND 400 Phase 2: Boxer combat reconnaissance vehicle

Boxer CRV	Total approved budget	Spend to 30 June 2021	Achieved spend in 2020–21	Planned spend in 2021–22
Equipment	5,655	1,452	386	665
Other project inputs to capability	113	29	?	10

Like many projects in a year of Covid-19, the Boxer project underachieved against its targeted spend ($386 million, as opposed to $566 million). This year, it's planning a big increase to $665 million as production progressively transfers to Rheinmetall in Queensland. The first tranche of 25 Boxer vehicles is being built in Europe. Deliveries were delayed due to Covid-19 (explaining the underspend), but all are to be delivered by the middle of 2021. Training has commenced. IOC is still scheduled for mid-2022.

The 'risk mitigation activity' that will result in the selection of the LAND 400 Phase 3 infantry fighting vehicle continues. We look at Defence's planned $30–42 billion investment in armoured vehicles in Chapter 5.

Figure 4.5: Australian Army soldiers and officers from the 2nd/14th Light Horse Regiment (Queensland Mounted Infantry) conduct a beach landing with the new Boxer combat reconnaissance vehicle

Source: Defence image library, online.

LAND 121 Phase 4: Hawkei protected mobility vehicle—light

Hawkei PMV-L	Total approved budget	Spend to 30 June 2021	Achieved spend in 2020–21	Planned spend in 2021–22
Equipment	1,953	1,200	426	548
Other project inputs to capability	0	0	?	0

Hawkei's up-and-down fortunes continue. In September last year, the government announced that the project was ready to enter full-rate production. However, the project hit another glitch. IOC for the Hawkei was scheduled for December 2020. Defence states:

> On 23 November 2020 a Hawkei vehicle experienced an issue with its brakes at the Puckapunyal Military Area, Victoria. To ensure the safety of personnel and property, Defence imposed restrictions on the use of the vehicle fleet and have deferred declaration of IOC until the issue is resolved. Thales Australia and Defence are in the last stages of agreeing the brake remediation plan, which will enable IOC to be declared shortly thereafter.[81]

Despite Covid-19 and the brakes problem, the project came very close to hitting its $440 million target. The next question is: what will become of Thales' Bendigo facility once Hawkei deliveries are completed next year?

LAND 121 Phase 5B—Overlander tactical training vehicles

LAND 121 Phase 5B	Total approved budget	Spend to 30 June 2021	Achieved spend in 2020–21	Planned spend in 2021–22
Equipment	1,173	348	?	231
Other project inputs to capability	226	6	-	37

LAND 121 Phase 3B, Army's medium and heavy truck project, has fallen out of the Top 30, but has been replaced by its little brother, Phase 5B, which is delivering an additional 1,044 medium and heavy vehicles, 872 modules and 812 trailers.

LAND 121 is the Army's complex of truck projects. It's had a long gestation but it's now well into delivery. All G-Wagons have been delivered. The medium and heavy component has achieved IOC, and Hawkei has entered full-rate production. But what do all those trucks cost? In short, over $7 billion. Table 4.4 sets out the most recent public data.

Table 4.4: Cost of LAND 121 project phases ($ million)

Phase	Title	Solution	Spend to date	Total approval
LAND 121 Phase 3A/5A	Field Vehicles and Trailers	Mercedes G-Wagon	900	900
LAND 121 Phase 3B	Medium and Heavy Capability	Rheinmetall MAN vehicles	2,752	3,401
LAND 121 Phase 5B	Tactical Training Vehicles	Additional Rheinmetall MAN vehicles	354	1,399
LAND 121 Phase 4	Protected Mobility Vehicle—Light	Hawkei	1,200	1,953
Total			**5,206**	**7,653**

Source: PBS, Defence annual reports.

LAND 19 Phase 7B—Ground-based air defence

LAND 121 Phase 5B	Total approved budget	Spend to 30 June 2021	Achieved spend in 2020–21	Planned spend in 2021–22
Equipment	1,201	443	167	162
Other project inputs to capability	236	4	?	2

The Army's air defence project continues to fly under the radar (sorry, couldn't resist that one), making few headlines. It seems to be tracking well, although it's not in the ANAO MPR, so there's not a lot of solid public data. Overall, the concept seems to be a good one, integrating a relatively proven overseas combat system, missiles that are already in ADF inventory, Australia's world-leading phased-array radar and Hawkei vehicles.

Getting this one right is important for the Army, as it's the first of several new capabilities (such as long-range fires and land-based anti-ship missiles) that will push it into the world of modern missile warfare and all that entails. So far, so good.

The collapse of the Army's digitisation efforts

Digitisation has been one of the Army's highest priorities for several years. It's been delivered by a complex of projects that have been aggregated under LAND 200. Delivery was meant to continue this year, when LAND 200 planned to spend $159 million, with another $100 million going on the sustainment of in-service systems. That, however, is all fundamentally in question.

Recent media reporting has stated that Defence is turning off its current battle management system (BMS), which was being delivered by Elbit. Defence has been tight-lipped, so it's not clear whether this is a temporary or permanent pause. The Minister for Defence Industry has said that the project isn't cancelled, but the pause seems to be of indefinite duration. Defence's actions are quite remarkable, considering that the project has been going for over 15 years and has spent nearly $2 billion between the BMS and the radios that carry its data. I can't

say whether Elbit's BMS is a good one or a bad one, but Defence has stated that it's a 'world leading capability'. There have been repeated rumours that the system has security flaws, and it was this that prompted Defence's decision. Those rumours have been denied by Elbit.

Again, I can't comment, but the reporting did prompt me to look more closely at the ANAO's reporting on the project, in particular an excellent 2019 report titled *Modernising Army command and control—the LAND 200 program*. It's also covered in the ANAO's annual MPR.

The battle management capability is part of a complex of projects called LAND 200 that are intended to 'digitise' the Army by acquiring a BMS and the communications system necessary to carry the BMS data. The Chief of Army has repeatedly described LAND 200 as the 'highest priority project in the Army'. These projects have been running since a first-pass decision in 2005 and have a combined expenditure approaching $2 billion. The program has been broken up into three successive 'tranches'. Elbit is not the sole industry partner in this enterprise. That's one of the problems; Defence didn't have a coordinated, programmatic approach to dealing with different suppliers, but for a long time dealt with the BMS and the communications technology provider through different projects with different budgets.

The ANAO paints a very long saga of delays, insufficient budgets, reductions in delivered outcomes, and project scope being pushed off into some point in the future. Virtually every page of the 2019 report contains factual accounts that give one pause. For example, the Tranche 2 tenders were unaffordable. Defence assessed the costs as being reasonable, but instead of increasing the program's funding provision (it's the Army's highest priority, after all), it spent over a year stripping scope out and moving it into future phases as well as engaging in what can only be termed 'magical thinking' to get costs down. That included taking on the role of prime system integrator, for which it was not suited, as well as failing to include integration costs in the estimated budget.

After 15 years, the capability seems to be working well at the headquarters level. However, it still hasn't been installed in all of the Army's vehicles. Due to program delays, decisions were made not to install the BMS on older vehicle fleets that were nearing retiring, such as the ASLAV reconnaissance vehicle. The largest number of installations was done on the G-Wagon, mainly to ensure that the network had an adequate density of 'nodes', but the G-Wagon can't be deployed into battle, as it's unprotected.

The program still hasn't delivered any dismounted capability. Fifteen hundred sets of an early version delivered in Tranche 1 at a cost of $56 million were found to be unsuitable and disposed of. The dismounted capability has been deferred to Tranche 3, which won't deliver operational capability until well into the second half of the 2020s. Based on the latest schedule (which has been delayed even since the ANAO's late 2019 report), the digitisation won't be complete until around 2030 at a cost of a further $2 billion.

So, is the pause/cancellation justified? The capability might be world leading, but can we continue to do business this way? Can we keep running projects that take 25 years to deliver what the Army has said is its highest priority?

The Army doesn't have a fallback. It's been funding some developmental work under the C4 Edge program, but it's tight-lipped about whether that's meant to be a future BMS. For now, it looks like we're back to running wars with pencil and paper.

Figure 4.6: A mock-up of a vehicle equipped with LAND 200 equipment

Source: Defence image library, online.

Army aviation

The patchy history of Army aviation continues, but there's one bright spot. The US Defense Security Cooperation Agency (DSCA) notified Congress on 29 April 2021 that Australia was seeking to acquire four additional CH-47F Chinooks at a cost of US$259 million.[82] This would bring the fleet to 14. This purchase wasn't foreshadowed in the FSP, which said only that Defence would continue to operate the Chinook. In the previous edition of *The cost of Defence*, we advocated for the acquisition of more Chinooks. They're the only ADF helicopter that can lift the M-777 howitzer or the Hawkei protected mobility vehicle. A Chinook provides much more capability than an MRH-90 and is cheaper to operate. The acquisition was foreshadowed in the DSU. Whether it's a way to manage underspends in the budget, or a planned development, it's a good decision. It helps take up some of the gap created by the consistently underperforming C-27J airlifter and MRH-90 helicopter.

Figure 4.7: Australian Army aircrew technicians and DFAT employee Jason Moore assist local people to move aid delivered by a CH-47F Chinook helicopter at a village during Operation PNG Assist 2018

Source: Defence Image Library, online.

The announcement on 15 January 2021 that the government would acquire Apache attack helicopters to replace the Tiger armed reconnaissance helicopter was more questionable, though not so unexpected. Certainly, the Apache should have been chosen over the Tiger 22 years ago, but it seems strange to invest billions in replacing the Tiger now with a crewed platform that will not survive on the battlefield against peer or even near-peer adversaries. If insurgents in Iraq and Afghanistan could shoot down Apache helicopters, any adversary armed with modern anti-aircraft systems will be able to do so without much trouble. Defence was fixated on replacing the platform with a platform and missed an opportunity to explore effects-based solutions.

Meanwhile, the MRH-90, a utility helicopter that Defence relies on for many roles across the spectrum of operations, continues in service despite being on the 'projects of concern' list for nine years and continually missing flying-hour targets. Despite ministerial intervention with the manufacturer, its operating costs (at $30,000–40,000 per hour) remain higher than those of combat aircraft with sophisticated weapons and sensor systems. The bottom line is that it has provided far too few flying hours for far too much money for far too long. It's a far more pressing candidate for replacement than the Tiger.

The Black Hawk fleet continues to ramp down and is due to be fully withdrawn from service in 2021–22, when the MRH-90 is finally ready to take over its special forces role. Since the MRH-90 will have shortfalls in that role, Defence has issued a tender to industry to acquire a light helicopter dedicated to special forces operations.

4.5 Air capabilities

AIR 6000: F-35A Joint Strike Fighter

F-35A	Total approved budget	Spend to 30 June 2021	Achieved spend in 2020–21	Planned spend in 2021–22
Equipment	15,631	8,878	2,402	1,949

Other project inputs to capability	1,727	1,524	?	6

2020–21 sustainment	2021–22 sustainment
258	216

The long journey begun back in 2002, when the government identified the F-35A as the preferred solution to Australia's new air combat requirements, has reached one of its most important milestones: IOC in the form of the first operational combat squadron.[83] The second combat squadron is currently transitioning to the F-35A. The third will transition in 2022.

That means that the last F/A-18 A/B 'classic' Hornet will retire from RAAF service at the end this year. While the fleet started its service in 1984, the aircraft will keep flying, as up to 25 are being sold to the Royal Canadian Air Force and most of the rest to a US air combat training company. A few will be gifted to museums and memorials.[84]

Last year, the F-35A program spent $2,402 million, which is a record for a Defence project, but it's still got a lot more to spend, as 33 aircraft out of the total 72 are still to be delivered. The planned spend for this year is nearly $2 billion.

While IOC has been achieved, it's not all plain sailing. Flying hours are increasing, while at the same time getting progressively worse as a percentage of planned flying hours (Table 4.5). To reach this year's target, the fleet will need to more than double last year's performance. That's been the case for the past three years and the fleet's failed to get there every time, by progressively larger margins. That hasn't stopped the capability declaring IOC, so one wonders what the point of the PBS's estimated flying hours is.

Much uncertainty remains around the sustainment cost of the air combat fleet (PBS tables 27 and 55). The forecast operating cost for the F-35A seems impossibly low this year. The Air Force wants to more than double the F-35A's flying hours in 2021–22 while decreasing its total sustainment cost. On paper, that results in a decrease from around $49,000 per flying hour in 2020–21 to around $18,000 per hour in 2021–22. In one year, the Air Force will achieve the Holy Grail of the international Joint Strike Fighter program, which is to get the operating cost of a 5th-generation aircraft down to something comparable to legacy 3rd- and 4th-generation aircraft. That is, quite frankly, completely implausible. One suspects that the estimated cost is based on a more realistic forecast of achievable flying hours than the one provided in the PBS.

Table 4.5: F-35A flying hours, planned and achieved, 2014–15 to 2024–25

	2014–15	2015–16	2016–17	2017–18	2018–19	2019–20	2020–21	2021–22	2022–23	2023–24	2024–25
2015–16	201	500	500	752	2,000						
2016–17		468 (94%)	500	752	2,538	4,564					
2017–18			408 (82%)	752	2,538	4,564	8,204				
2018–19				702 (93%)	2,538	4,564	8,204	11,831			
2019–20					2,036 (80%)	4,564	8,204	11,831	14,519		
2020–21						3,097 (68%)	8,204	11,831	14,519	14,900	
2021–22							5,250 (64%)	11,831	14,519	14,519	14,900

Actual achievement (with achieved % of flying hours)	PBS estimate for the year	PBS estimate for forward estimate years

Sources: Defence annual reports, PBS.

Super Hornet / Growler

Growler Airborne attack capability	Total approved budget	Spend to 30 June 2021	Achieved spend in 2020–21	Planned spend in 2021–22
Equipment	3,427	2,680	87	208
Other project inputs to capability	366	351	?	-

Advanced Growler development	Total approved budget	Spend to 30 June 2021	Achieved spend in 2020–21	Planned spend in 2021–22
Equipment	505	236	122	112
Other project inputs to capability	72	11	?	6

2020–21 sustainment	2021–22 sustainment
455	521

The flying cost of the combined Super Hornet and Growler fleet already seemed impossibly large at over $61,000 per hour, but that's predicted to grow even further, to $76,000. Those numbers include a spiral upgrade program that traditionally would be treated as capital acquisition, inflating the sustainment cost.

Even though the Growler has been in service for four years, the original acquisition project still hasn't achieved final operational capability, as the mobile threat training emitter system (a radar system that pretends to be an enemy air defence system for the Growler to train against) that's part of the project hasn't been delivered yet. The PBS also states that Defence is looking to 'progress options' to replace the Growler written off three years ago after it caught fire on the ground. Presumably, those two factors are the reason why the original Growler acquisition project wants to spend $208 million this year. Meanwhile, Australia's contributions to the US Navy's program to develop more advanced Growler capabilities are ramping up with a $112 million planned spend this year.

If we combine the two acquisition projects with the estimated sustainment cost, we get to a total $847 million spend for the combined Super Hornet / Growler fleet this year. It's an expensive capability. Moreover, the $500 million development phase of the advanced Growler is only the tip of the iceberg, as Defence's website lists a $5–6 billion total cost.

Air Force UAVs—AIR 7000 Phase 1 (Triton)

Triton	Total approved budget	Spend to 30 June 2021	Achieved spend in 2020–21	Planned spend in 2021–22
Equipment	1,953	395	192	320
Other project inputs to capability	492	47	?	71

If you thought uncrewed systems meant cheaper, faster delivery and greater agility (to use Defence's favourite words), then you haven't been looking at the Air Force's unmanned aerial vehicle (UAV) projects. The US's high-altitude, long-endurance UAV, the Global Hawk, first flew in 1998. It first visited Australia in 2001 as the first pilotless aircraft to cross the Pacific. Twenty years later, Australia is still waiting for our version of the Global Hawk, the Triton, to arrive. Tracking the long, tortuous history of Australia's program is virtually a full-time job. Helpfully it's now covered by the ANAO MPR. Defence has been in and out of the Triton program since 2006. The government has adopted one of the strangest approval strategies in Defence's acquisition history, incrementally approving single aircraft (we are now at three, aiming to get to six or seven). The latest schedule glitch was caused by the US Navy putting a two-year production pause in place last year. Nevertheless, Defence is continuing. Not surprisingly, it's a 'project of interest'. IOC is scheduled for the second half of 2025, according to the latest Capability Acquisition and Sustainment Group quarterly report.

The total approved budget to date is nearly $2 billion, but that's only for ground stations and the first three aircraft. The projected spend for 2021–22 is $320 million, making it Defence's second biggest aircraft acquisition project after the F-35A this year.

Air Force UAVs—Sky Guardian

On 16 November 2018, the government announced that it had down-selected to a variant of the General Atomics MQ-9 Reaper for its medium-altitude long-endurance armed UAV. One year later, the government announced that the variant would be the MQ-9B Sky Guardian. Defence's website says that second pass will be in 2022.[85] That suggests that IOC will be well into the mid-2020s—around seven years after the government first announced that it would get Reaper. It's also around 25 years after Reaper first flew and 18 years after it first flew on operations in Afghanistan. We're certainly not early adopters in this space.

As usual, the US Government's own transparency arrangements tell us more than our own government does. The Defence Security Cooperation Agency informed Congress that Australia had been approved to acquire 12 MQ-9B Sky Guardian air vehicles and associated equipment for US$1.165 million (around A$2.15 billion).[86] The Australian Government announced in November 2019 that Sky Guardian was a A$1.3 billion program, but the FSP increased that to $1.6–2.4 billion.[87] There are likely to be significant other project inputs to capability in addition to the US agency's figure, so even $2.4 billion is looking a little short.

In some ways, it's going to have a lot more firepower than an attack helicopter, as it's able to carry GPS- and laser-guided bombs as well as Hellfire missiles, making the Apache acquisition decision even harder to justify.

Air Force UAVs—Loyal Wingman

One large glimmer of hope among the Air Force's continually sliding UAVs is the Loyal Wingman, which first flew on 27 February 2021.[88] At the time, the government announced an additional $115 million investment in the development of the capability, including the acquisition of three more aircraft beyond the original three.[89] The total provision in the FSP for 'teaming air vehicles' is $7.4–11 billion, suggesting that Defence will buy it if Boeing Australia and its partners can make the concept work. Linking R&D activities to real acquisition dollars is a nice precedent for Defence.

The ANAO is currently conducting a performance audit of the Air Force's UAV programs. It should put some more data out in the public sphere.

AIR 7000 Phase 2B: P-8A maritime patrol aircraft

	Total approved budget	Spend to 30 June 2021	Achieved spend in 2020–21	Planned spend in 2021–22
Equipment	5,633	4,199	83	255
Other project inputs to capability	901	633	?	93

On 30 December 2020, the government announced a somewhat late Christmas present for the Air Force: two additional P-8A maritime patrol aircraft.[90] It was a surprise announcement, as the FSP didn't state that acquisitions of further aircraft beyond the 12 that Defence had already acquired were planned. It did, however, state that 'the Government will keep under review the future balance between the MQ-4C Triton, the P-8A Poseidon, and other capabilities in light of emerging technological and strategic change' (page 57).

In response to ASPI's question on the reasons for the decision, Defence stated:

> The Government has continued to review the future balance between the MQ-4C Triton and the P-8A Poseidon and other capabilities, cognisant of emerging technological and strategic change. An additional two P-8A Poseidon at this time would ensure a good balance between strategic need, the pending MQ-4C Triton production pause, and the impending closure of the Boeing P-8A Poseidon production line.[91]

Overall, it's a good decision, considering the risks around the Triton program and the vast size of Australia's area of interest defined in the DSU. It's one of the few platforms that can project deep into that region. The announcement also stated that Defence would also acquire the Long Range Anti Ship Missile for the aircraft, which is another good decision. Integration is being conducted by the Australian–US Navy cooperative P-8 program. Unfortunately, integration won't be complete until 'mid-decade', according to Defence. But since we can't buy American missiles for love or money at the moment due to the Pentagon's demand, faster integration probably wouldn't make much difference anyway.

Also according to Defence, the costs for the new aircraft are 'approximately $700 million', which includes the aircraft themselves, facilities, spares and support. The total approved project budget has gone up by only $309 million, so presumably there were substantial funds remaining in the existing budget that could be put towards the new aircraft.

AIR 6500: Integrated air and missile defence

Phase 1 of AIR 6500 is meant to acquire the next-generation air battle management system; that is, the system that's meant to hold all of the air capabilities we've just discussed together. But there's been very little out of Defence on it since a 2017 industry briefing was put on AusTender.

AIR 8000 Phase 2: C-27J battlefield airlifter

2020–21 sustainment	2021–22 sustainment
83	73

The C-27J has consistently missed flying-hour targets. It's also been extremely expensive to operate, costing more per hour than a massive C-17A. Forecasts for 2021–22 are no different. It's got all the hallmarks of a perennial underperformer along the lines of the MRH-90 and Tiger ARH. At least this year in the PBS, Defence has revised the 'sustainable Rate of Effort' (that is, its mature-state goal) down from 7,500 hours to 5,500. That's still 64% more than it's been able to achieve, but at least it's a more realistic goal than 7,500. Overall the project is a classic case study in Defence replacing old platforms on a like-for-like basis rather than looking at how it can deliver effects differently.

Projects of Concern

The following two projects remain on the Projects of Concern list:

- AIR 9000 phases 2, 4 and 6 (MRH-90 multi-role helicopters). MRH-90 has now been a project of concern for nine and a half years. Because the sustainment system 'is not achieving the approved level of capability', it's also a sustainment 'product of interest'. Defence notes that ministers have 'communicated to industry that the poor performance and low supportability was unacceptable.'[92]

- AIR 5431 Phase 1 (deployable defence air traffic management and control system). The project has been on the list since August 2017. On the upside, it has delivered the first deployable system.[93]

Defence has also identified a potential project of concern:

- AIR 5431 Phase 2 (Fixed defence air traffic control surveillance sensors).

There seems to be something fundamentally challenging about air traffic control technology; the third (and largest) phase of the AIR 5431 complex of air traffic control projects was also on the Projects of Concern list between August 2017 and February 2018, remains a project of interest, and required a $247 million budget increase.

Chapter 5: Evolving the Defence Strategic Update

Key points

- The funding model in the DSU is the same as that presented in the 2016 DWP. Despite Australia's increasingly uncertain strategic environment, Defence's funding envelope for the coming decade has not increased beyond the one developed five years ago.
- There's a fundamental misalignment between the assessments in the 2020 DSU about the nature of the threats we face, the kinds of capabilities in the 2020 FSP that are intended to address them and the schedule to deliver those capabilities. Defence will need to remedy that quickly and imaginatively.
- Despite the DSU's emphasis on the need for long-range strike capabilities, the cupboard is bare. We need to pursue a broad range of solutions simultaneously. We need to remember that the perfect is the enemy of the good.
- Defence will remain dependent on small numbers of ageing, increasingly vulnerable crewed platforms under the current plan. Investing in the smart, the small and the many can help mitigate the risks in the current force structure. That will require significantly enhanced R&D funding and actively using acquisition funds to turn that R&D into capability.
- Time is of the essence.

On 1 July 2020, the government released its Defence Strategic Update. While the DSU wasn't called a white paper, it had all the strategic heft of one. The DSU was remarkable for its frank assessment of our strategic circumstances. Gone were the long-held assessments that as China became richer, it would become democratic, more supportive of the current 'rules-based global order' and somehow more like us. Gone, too, were long-held views that the US's economic and military power would remain unrivalled.

The DSU delivered some stark statements; however, the accompanying Force Structure Plan—the public outline of the capabilities Defence would acquire—did not align with the strategic assessments in many ways.

ASPI presented a detailed analysis of the DSU in Part 1 of 2020–21's *The cost of Defence*. We don't repeat that here. Rather, we look at key risks facing the implementation of the DSU, including the misalignment between the DSU and FSP, and consider how the government is addressing them.

Incidentally, the subject of ASPI's annual conference this year is the DSU. Reading this chapter and Part 1 of last year's edition should get you well up to speed on the key issues to be covered at the conference. And don't forget the DSU itself.

5.1 Key features of the DSU

A new assessment of our strategic risks

The DSU redefines our immediate region. It's a very large region, described as stretching from India through mainland Southeast Asia, maritime Southeast Asia, to Papua New Guinea and beyond to the countries of the South Pacific. However, since there's no map in the DSU, the region seems to be more of a concept than a firmly

bounded piece of geography. Either way, it's big. It's probably the equivalent of the inner two or even three circles of the older 'concentric rings' view of our strategic priorities.

The DSU prioritises the immediate region. The focus of Defence's planning is now firmly on Australia's near region. That helps define what Defence should be doing. It's not clear, though, how that helps force structure planning. The region is geographically diverse enough to generate enough hypothetical scenarios to justify any capability, from boots to aircraft carriers.

Defence's three priorities are now shape, deter, respond. While the three concepts are nothing new for how Defence views what it does, the elevation of shape to an equal priority with deter and respond indicates that the government regards Defence as an everyday tool, not just a 'break glass in case of emergency' tool of last resort. That might not fundamentally change what Defence buys, but it will change what it does—although doing more will be likely to require more capacity. The Pacific Step-up, first announced in late 2018, was an early sign of this approach.

New offensive capabilities are needed. The DSU states that the ADF is equipped with largely defensive capabilities that aren't well suited to deterring or responding to a great-power adversary's actions. It assesses that new capabilities are needed that can 'hold potential adversaries' forces and infrastructure at risk from a greater distance, and therefore influence their calculus of costs involved in threatening Australian interests.'

There are signs of asymmetric thinking. The recognition that Australia won't enjoy the same unchallenged technological advantage over adversaries is clearly stated. While the word 'asymmetric' isn't used in the DSU, there are signs that we'll have to think and act differently from before. We can't 'seek to match the capability of major powers', yet somehow we'll need to develop the ability to deter them.

We can no longer rely on warning time. This is perhaps the most significant assessment. Defence planning previously relied on a 10-year strategic warning for major conflict. That's no longer the case. Our situation is urgent. In hindsight, the warning time clock started ticking 10 years ago.

The ADF will get even broader. The DSU and FSP describe entirely new capabilities, such as ballistic missile defence and ground-based anti-ship and long-range strike missiles. Some existing and previously planned capabilities will be expanded. Moreover, enhanced responses to increasingly frequent natural disasters at home and abroad will be core business. No capabilities are being given up. In essence, the ADF will be stretched even thinner.

It's the same dollars

The DSU reaffirmed the 2016 DWP's fixed funding line for Defence and extended it at the same rate of growth for another four years, re-establishing a 10-year funding window. Considering that the DSU was released at the peak of the Covid-19 pandemic, when some of the most dire scenarios for GDP and government deficits and debt were still possible, that was a big win for Defence.

However, the DSU assessed that 'while the drivers shaping the development of Australia's future strategic environment identified in [the 2016 DWP] remain relevant, some have accelerated in ways that were not anticipated in 2016.' It's reasonable to ask whether a funding model developed for the strategic environment assessed to be our future in 2016 is sufficient for the strategic environment we see today and over the remainder of this decade.

It's also useful to remind ourselves that virtually every strategic policy document Australia has published in the past 20 years has confessed that key drivers (such as the rise of Chinese economic and military power, the

proliferation of advanced military technologies, and so on) have accelerated faster than we expected. Unless we become more proactive, we'll be saying the same thing in the next one. It's time we got ahead of the curve.

It's (largely) the same force structure

The FSP still presents basically the same force structure as that planned in the 2016 DWP. That, in turn, was largely the same force structure as that presented in the 2009 DWP. In fact, one of the most striking aspects of the ADF is just how stable its force structure has been for many decades. It's broadly the same number of ships, aircraft and Army units that we've had virtually back to the era after the Vietnam War.

Certainly, capabilities get added to the mix, so the force gets stretched broader and thinner. Nothing significant ever gets retired without being replaced—the last significant example of that was the aircraft carrier HMAS *Melbourne* in 1980.

The DSU continues the practice of adding new capabilities. Presumably, the new ones are there because we've realised we need them to address our strategic circumstances now, yet they're mostly to arrive well into the future. Figure A.10 in 'Defence in 10 tables' maps out the schedule of capability delivery in the FSP. Generally, the new capabilities don't start arriving for a decade.

The missing operational middle

Strategy aligns ends, ways and means. Ends are the goals you want to achieve. Means are the resources you're willing to apply to the task. Ways are how you're going to use those resources to achieve your goals. Broadly speaking, the DSU addresses the ends and means, but there's no discussion of ways, or how resources will be used to achieve goals. Put another way, there's no discussion of how the force will be used, other than in the most general terms (with allies, with agility, etc.).

Every reader is left to fill that gap and reverse-engineer operational concepts that make sense of the force structure—according to the assumptions that the reader brings to the exercise. That leads to many different and inconsistent views of what we're acquiring all the equipment for. And, frankly, if the main operational challenge is to impose greater cost on a major-power adversary at greater range, a lot of the planned investments just don't make sense. For example, what exactly is the $36 billion investment in armoured vehicles for? Are we still considering ground wars in Asia? And if so, where and why? The DSU doesn't say. In the absence of operational concepts, the case can be made for any capability—an approach which continues to stretch the force wider and wider.

5.2 Developments since July 2020

Unplanned acquisitions

Since the DSU was published, two acquisitions that weren't included in it have become public. The first of them was the government's announcement that it's acquiring two additional P-8A maritime patrol aircraft. The second was the US Defense Security Cooperation Agency's notification to Congress on 29 April 2021 that Australia was seeking to acquire four additional CH-47F Chinook helicopters. We discussed both of those in Chapter 4. Whether they were part of the FSP but just not published in it, or whether they truly were opportunistic buys, both are positive steps and will result in a reasonably fast, low-risk increase to ADF capability. Moreover, they suggest that Defence can make rapid capability decisions.

Defence has also approached industry seeking information on options to upgrade the antisubmarine capability of the Anzac-class frigates and Hobart-class destroyers in order to 'de-risk' the Hunter-class frigate. That's Defence-speak for 'We can't wait another 10 years to get capability to sea.' The plan includes installing a towed-

array sonar on the Anzacs—something that should have been done years ago. It's frankly mystifying why the Navy's primary antisubmarine asset doesn't have this core tool. It's another measure that wasn't mentioned in the FSP, but it's a good one. Of course, getting a lot of towed-array sonars to sea on swarms of small, cheap uncrewed vessels would be a good thing too.

The Defence Transformation Strategy

On 27 November 2020, the government released the third leg of the DSU: the Defence Transformation Strategy (DTS). It wasn't a good sign that it was titled *Lead the Way*, but trailed the other two legs by five months.[94]

The first question is why it was needed. Defence has recently undergone a substantial reform process under the First Principles Review of Defence (FPR). The FPR stated that:

> While speed in implementation is important, Defence should be given an appropriate period to embed changes at all levels, deliver the required outcomes, and assess the impact and need for further reform or adjustment. Therefore, we recommend no additional reviews on the organisational issues covered by this Review are imposed on Defence, particularly within the early years of implementation. (page 72)

However, the DTS starts with a lot of reviews. One might assume, then, that implementation of the FPR has been unsuccessful or incomplete. Yet Defence gave frequent updates in its annual report and Senate estimates appearances indicating that progress was on track. In its 2018–19 annual report, it stated that 73 of the FPR's 75 recommendations had been implemented, and that the other two were expected to be completed by 2023.

So, what hadn't been fixed that needed to be fixed? It's not clear. Moreover, it's not clear that Defence knows. The implementation plan overview accompanying the DTS says that implementation will take an 'agile' (of course!) phased approach. Phase 1 will 'articulate the problem statement—identifying the problem we need to solve'. It's remarkably brave to issue a strategy before you've even identified the problem that you're attempting to solve.

After wading through the usual smorgasbord of adjectives and abstract nouns such as 'agile'/'agility' (16 times) and 'innovation'/'innovative' (22 times), it's hard to escape the impression that the DTS is yet another Defence corporate policy document from inside the Russell bubble that's completely impenetrable to anybody outside it. If Defence is concerned that its reform attempts aren't gaining traction with its workforce, it might consider writing strategies that genuinely seek to inspire and motivate them. And they might be considerably shorter and punchier than the 80-page DTS, so at that everyone in Defence, defence industry and with an interest in Defence can understand the plans and priorities.

Implementation is broken into three phases. The first, due for completion by June 2021, involves around 11 activities, such as conducting reviews, designing strategies, developing plans and so on. The second phase appears to be implementing the things developed in Phase 1. The third and final phase will be to 'demonstrate progress'.

Snarkiness aside, there are things that Defence needs to get better at, and Defence itself recognises that. With regard to the capability life cycle (which, incidentally, underwent a fundamental reassessment and redefinition at the FPR's recommendation), the DTS states that Defence will introduce measures and activities to:

- increase our agility and speed in capability delivery, including more innovative approaches to how and when we partner with industry

- increase our commercial acumen in order to become an informed and effective purchaser that ensures value through our investments.

If nothing else, the trajectories of the Submarine Escape Rescue and Abandonment System and LAND 200 confirm that that Defence is still a long way from where it needs to be in terms of agility and commercial acumen. Whether another round of process reformification and transformifying will get it there is doubtful.

Domestic missile manufacture

The DSU outlines an around $100 billion investment in guided weapons over the next two decades. In light of the centrality of guided weapons to modern warfare (brutally reinforced in last year's Azerbaijan–Armenia conflict), that's appropriate. However, one of the more noteworthy measures in the DSU was that the government directed Defence to 'explore the potential for new sovereign guided weapons production capability'. It appears that exploration has determined that the potential can be turned into reality: on 31 March, the government announced that it was 'accelerating' the development of a sovereign guided weapon manufacturing capability.

ASPI has examined this issue in some detail.[95] If implemented correctly, domestic missile manufacture will mitigate supply-chain risks and help provide the ADF with the large quantities of advanced weapons it will need in any future conflict. All the necessary ingredients are in place: the government's defence industry and broader modern manufacturing policies; a $100 billion demand signal to industry; extensive existing industry capability (in some cases world leading); strong relationships with international primes; a new administration in Washington that is likely to be supportive of transferring intellectual property; and, perhaps most importantly, growing awareness in the government and Defence that we need to do business differently. Of course, Defence will also need to do what the DTS describes as developing 'more innovative approaches' to how and when it partners with industry and increasing its 'commercial acumen'.

5.3 Challenges for the DSU

Defence will need to bring the DSU and the FSP into alignment. Here are some areas that will need particular attention.

The strike cupboard is empty—we need faster ways to fill it

The DSU states that the ADF needs long-range strike capability to impose cost on an adversary at greater range, but the bottom line is that the strike cupboard is empty. Unless the target is a ship or submarine and we can use one of our six submarines to sink it (noting that only two are available for operations at any time, on average), the ADF has virtually no ability to independently prosecute targets beyond 1,500 kilometres from Australia. That's about the maximum range of the F-35A Joint Strike Fighter, even with air-to-air refuelling.

Certainly, there are lines of funding in the FSP to acquire strike capabilities, but there's nothing soon. Late last year, the government announced that Australia and the US had signed a 'new collaborative agreement to develop and test hypersonic cruise missile prototypes'. The announcement didn't mention schedule, but, since it also referred to more than 15 years of collaboration between Australia and the US on hypersonic technologies, one gets the feeling that without ministerial intervention this latest effort could follow Defence's usual time lines.[96]

How about we take a parallel approach in line with the philosophy of building indigenous capability and set a grand challenge with $100 million in funding to get a working hypersonic missile within two years? The competition would be technology agnostic. The capability doesn't have to be particularly sophisticated or need to hit moving targets. It simply needs to go 2,000 kilometres and hit a GPS point. It needs to be able to be

produced in Australia with components manufactured in Australia. Defence could pick three competitors, one of which has to be an Australian small to medium-sized enterprise. The capability might not be the smartest missile in the world, but it will mean that any potential adversary will need to factor into their calculus that, if its bases are within 2,000 kilometres of Australian forces, they can be subjected to a strike at any time. There's $6.2–9.3 billion in the FSP for hypersonic weapons; let's start taking some risks and spending some of it on fast, but 'good enough', solutions.

Another way to develop a strike capability would be to re-establish Australia's bomber fleet. We've written about this previously and won't repeat the arguments for it in detail, but doing it would establish a credible, survivable long-range strike deterrent much earlier than the future submarine and at substantially less cost (which isn't to say that this should be an either/or proposition). The most obvious candidate is the US Air Force's B-21 stealth bomber program.[97] That might be able to deliver an Australian strike capability by the late 2020s. Another solution could be a larger, twin-engine version of the Loyal Wingman that could carry stand-off weapons several thousand kilometres. That would take substantial R&D investment. Which gets us to our next point.

Boost R&D spending—and link R&D to acquisition

The DSU states that the Australian Government 'has committed around $3 billion of capability investment in Defence innovation, science and technology over the next decade' (paragraph 9.27).

The innovation funding streams identified in the DSU are:

- the Next Generation Technologies Fund at 'approximately $1.2 billion' over the next decade
- the Defence Innovation Hub at 'over $800 million of further investment' over the decade
- the new Capability Acceleration Fund to be introduced from the middle of the decade, with funding of over $130 million.

That totals around $2.1 billion. The other elements are not identified.

$3 billion is around 0.5% of Defence's total budget over the decade.[98] We simply aren't serious about R&D. That has to change.

Aside from the money, there are Defence's time lines. According to the Defence Innovation Hub's own processes, taking an idea though its four phases from concept to the demonstration of a prototype takes between three and 11 years. That's before it goes into production and enters service.[99]

It's becoming increasingly clear that, if we want real innovation in defence technology, we have to do it outside of Defence. Whether it's through the creation of an Australian version of the US Defence Advanced Research Projects Agency (DARPA), or by DARPA itself opening a partner office in Australia, or through larger, better funded Defence cooperative research centres, we need more lines of effort that don't approach the problem with Defence's time lines, its risk aversion and its process overhead.

Another thing that has to change is that innovation has to be linked to Defence's major acquisition projects, which have the funding for actual contracts. Defence funded the development of the Australian company DefendTex's Drone 40. It's now been acquired by the British Army for operations in Mali. The ADF hasn't acquired it. If we aren't going to back up innovation funding with production contracts, what's the point?

As my ASPI colleague Michael Shoebridge puts it:

Given the time cycles of technology—and the speed of deterioration and change in our strategic environment, it's highly unlikely that the further incremental improvement of the Capability Life Cycle and CASG processes will make an elaborately-orchestrated, slow-moving capability procurement machine able to also be a rapid technology spotting and adopting machine.

Defence's capability acquisition process is a deliberately low tempo 'slow food movement' —small numbers of exquisitely selected ingredients, assembled lovingly over time into highly sophisticated major platforms available to only the elect few, with reorder times of decades. The CLC and the CASG acquisition system have been built by adding layers of risk mitigation through extra process, on top of an already cluttered set of Commonwealth and defence policies and processes. But slowness itself creates risk.

What the current technology cycle and strategic environment require is a separate and complementary 'fast food movement' to supply new technology t that is able to be developed, acquired, deployed, lost and replaced at paces and volumes more like Big Mac burgers and fries than 5-star Michelin degustations.

The two tasks are so different that the government may decide that Defence needs an entirely new fast technology capability adoption machine.

That would need to be a new organization outside of CASG, probably run by technologists and industrialists, not service personnel or public servants, and on timelines that acquire things service personnel actually can use within the time it now takes Defence to do a Gate 0 study before seeking approval to start a project process.

Do we need so much heavy metal?

Recently, the US Defense Security Cooperation Agency notified Congress that Australia was seeking to acquire 75 new M1A2 tanks and 47 engineering vehicles at a cost of US$1.685 billion (A$2.164 billion). That prompted the usual round of skirmishing in the media between those who think tanks are obsolete and those who think 'tanks save lives'.

But tanks are only a very small part of the Army's combat vehicle plan. Taken together, the elements of the plan total somewhere between $30 billion and $42 billion, based on their FSP provisions (Table 5.1). So far, the only component in contract is the Boxer combat reconnaissance vehicle. In addition to the acquisition cost, we've estimated that the annual sustainment cost of the Boxer and infantry fighting vehicle (IFV) fleets will be in the order of $700 million alone—that's up there with the sustainment costs of Defence's currently most expensive capability, the Collins-class submarine.

Table 5.1: Defence's armoured vehicle acquisition plans

Year	Number of vehicles	FSP budget	Status
Boxer combat reconnaissance vehicle	211	$5.768 billion (approved)	First tranche of 25 delivered from Europe. Local production commencing.
Infantry fighting vehicle	450	$18.1–27.1 billion	Selection process underway.
M1A2 tank	75	$0.6–1.0 billion	Congress notified of potential purchase.[a]

Combat engineering vehicle	29 assault breacher vehicles 18 assault bridges	$0.9–1.3 billion	Congress notified of potential purchase.[a]
Self-propelled howitzer	60 howitzers 30 resupply vehicles	$4.5–6.8 billion	Restricted RFT issued to Hanwha for the K-9.
Total	873	$30–$42 billion	

a Defense Security Cooperation Agency, 'Australia—heavy armored combat systems'. news release, US Government, 29 April 2021, online.

In Part 2 of last year's *The cost of Defence*, we urged the government and Defence to reconsider the planned investment in the IFV. We'll repeat that passage in full:

> Surely we've reached the point at which we have to consider whether the capability is worth it. With the news and internet saturated with video footage of regional conflicts in which armoured vehicles are being routinely destroyed from above by precision-guided weapons launched from drones, manned aircraft, artillery or infantry, there's an air of unreality to the entire $18.1–27.1 billion enterprise. Such capabilities are no longer the preserve of advanced Western militaries: China, Russia, Israel and Turkey all manufacture and export them to numerous militaries. While the ADF doesn't yet have an armed unmanned aerial vehicle, many other countries in our region do. There's also the possibility of 'leakage' to non-state actors.
>
> Then there's the question of how we would transport a fleet of 40-tonne IFVs to the battlefield where they would face those threats. They would have to cross a 2,000-kilometre zone of death, as Albert Palazzo has termed it, in the face of anti-ship threats described accurately in the DSU.[100] Is that possible against a major power employing a range of advanced area-denial capabilities, particularly when the 2020 DSU admits that we can't match a major power?
>
> That seems to be saying we could only use them in a war of choice against an irregular adversary. But is a capability costing $18.1–27.1 billion that's only useful and survivable in wars of choice our highest priority in the light of the DSU's assessment of our strategic circumstances?
>
> So, what's the alternative? There's a range of potential ways forward. One is to cancel the IFV program and invest the savings in other capabilities. That could include an additional tranche of Boxers, but substantially fewer than the 450 IFVs currently planned (by the way, the United Kingdom is acquiring the Boxer as its future IFV, so we already have an IFV). It could be complementary land capabilities, including tactical armed unmanned aerial vehicles for land units, or launchers for swarms of suicide drones. Some may be fundamentally different ones, such as more maritime strike weapons, offensive cyberweapons, hypersonic missiles or air combat capabilities (that is, the kinds of capabilities the DSU says are what we need to deter a major-power adversary).

Another point to note is that one of the major cost drivers for the Army's new armoured vehicle fleets is the force structure implemented under Plan Beersheba. Before that, each of the Army's combat brigades had very different equipment and structures. Only one was mechanised with tanks and armour. The other two were much lighter. In order to sustain deployments to Afghanistan, the Army adopted Plan Beersheba, which gave all three brigades an identical structure. That means that the Beersheba philosophy requires all three brigades to have an armoured calvary regiment with tanks and heavy cavalry vehicles as well as infantry battalions with IFVs—an example of how a previous deployment can drive enormous cost implications into future programs and plans. One way to reduce the scale of investment is to reconsider whether the Army's force structure is the right one for

the region identified in the DSU. It seems strange to develop an Army that can't deploy to the region that the government has identified as its strategic priority.[101]

Dependence on ageing vessels—with no new ones coming soon

HMAS *Anzac* is 25 years old this year. If it serves until the first Hunter-class frigate is operational (and the Hunter program delivers on schedule), it will be 35. The eighth and last Anzac-class frigate commissioned was HMAS *Perth* in 2006. If it serves until the eighth future frigate is operational around 2045, it could be close to 40. They'll all serve longer than any of the Adelaide-class FFGs. The situation with the Collins fleet is even worse; they'll be even older. While a life-of-type extension is planned for the Collins, and Defence and the government seem to be moving to the view that all six boats will need to go through it, keeping the class a cutting-edge war-fighting capability into its 40s will be extremely challenging.

Moreover, the government's $575 billion spend on Defence this decade won't see a new combat vessel delivered in that period. Overall, the programmatic risk in the Navy's capability is enormous. And even when the first new frigates are delivered they'll be substantially outgunned by Chinese designs with three times as many launch cells. Admiral Gilday, the US Navy's Chief of Naval Operations, lamented that he couldn't keep building $3 billion ships to get 96 missile cells to sea. Unfortunately, Australia is spending $3 billion on ships to get only 32 missile cells to sea.

Defence needs to find ways to get weapons and sensors to sea quickly and more economically. Installing towed-array sonars on the Anzacs is a good decision, but it still relies on a small number of ageing ships. Autonomous and uncrewed systems are one possible way to do that, but making more use of the platforms that it's already getting is another, particularly when those platforms can be produced quickly and cheaply. Installing anti-ship missiles on a $250 million offshore patrol vessel would give it the same anti-ship capability as an air warfare destroyer as part of networked, distributed force.[102]

The smart, the small and the many

That's another way of saying we need to explore the potential of the smart, the small and the many and invest much more heavily in them.[103]

A century ago, a small ship couldn't hurt a big ship unless through a lucky shot with a torpedo at close range. The big ship had bigger guns with much longer range, plus much thicker armour that the small ship's guns couldn't penetrate. Now a 500-tonne missile boat can fire the same missile as a 10,000-tonne destroyer with the same range and lethality. Moreover, a single well-placed missile strike can take the 10,000-tonne destroyer out of the battle.

It's good that the government has decided to build missiles here. In economic value, it could be as large as the national Naval Shipbuilding Enterprise but, in strategic weight, it will be significantly more important. A ship without missiles is useless. However, missiles can be launched from many things other than ships.

The small, the smart and the many will eventually be highly autonomous. In the meantime, they'll work as part of aggregations of crewed, uncrewed, minimally crewed and attritable systems. Making those aggregations work will require lots more R&D investment now (more than our current 0.5%), but they'll be much more survivable than our current force structure based on exquisitely capable, extremely expensive platforms that are too vulnerable to deploy into battle. And Australian industry is probably better suited to producing the small and the many than the elaborate, complex highly integrated platforms Defence knows and loves

Getting the workforce genie back in the bottle

The final challenge will be the defence workforce. The government and Defence haven't stated what their objective uniformed workforce target is. Whatever it is, it's going to need to be substantially more in order to operate the new capabilities planned in the FSP. But, as we discussed in Chapter 3, Defence's management of a potential explosion in external workforce numbers, particularly contractors, will be the biggest challenge.

Defence's acquisition and sustainment programs are essentially doubling in size. Defence will need people to manage those programs. If the government doesn't let Defence grow its APS workforce, it will need to hire external workforce at more than twice the cost. How many contractors it will need to hire is difficult to determine, but it's easy to envisage the numbers doubling as the acquisition and sustainment programs double. The contracted workforce has grown by 45% in less than two years.

Over the decade, Defence's local acquisition spend will increase threefold or even fourfold, while its local sustainment spend will double. That means that Australian defence industry's workforce demand will also increase dramatically. However, many of the skills that Defence needs to be an informed customer, or a smart buyer, to use Defence's term, are the same skills industry needs to design and deliver the required products and services. So Defence, its service providers who supply its contracted workforce, and industry delivering products and services are all competing for the same workforce.

The private sector has more levers to pull to attract workforce. Money is one of them—a cost that it passes on to Defence. Defence, however, doesn't have the same ability to match its financial offer to industry's.

In short, Defence will potentially be unable to attract the workforce it needs, while it pays several billion dollars per year more on external contractors than if it had public servants doing the same work. It's a looming, but eminently predictable, train wreck. Avoiding it needs to be Defence's highest corporate priority.

Acronyms and abbreviations

ADF	Australian Defence Force
AEC	Atlas of Economic Complexity
ANAO	Australian National Audit Office
APS	Australian Public Service
ASD	Australian Signals Directorate
CCP	Chinese Communist Party
DARPA	Defence Advanced Research Projects Agency (US)
DCP	Defence Cooperation Program
DSU	Defence Strategic Update
DTS	Defence Transformation Strategy
DWP	Defence White Paper
FPR	First Principles Review of Defence
FSP	Force Structure Plan
GDP	gross domestic product
GPS	Global Positioning System
ICT	information and communications technology
IFV	infantry fighting vehicle
IOC	initial operating capability
LOTE	life-of-type extension
MPR	*Major projects report*
OPV	offshore patrol vessel
PAES	Portfolio Additional Estimates Statements
PBS	Portfolio Budget Statements
R&D	research and development
RAAF	Royal Australian Air Force
UAV	unmanned aerial vehicle
UK	United Kingdom

Notes

[1] Michael Shoebridge, 'China's actions, not Australia's words, are the problem', *The Strategist,* 28 April 2021, online; Michael Shoebridge, 'Australia's "China debate": Time to end domestic politicking and focus on Xi's destabilising words and actions', *The Strategist,* 19 May 2021, online.

[2] Executive Office of the President, 9 April 2021, online.

[3] Junnosuke Kobara, 'Japan to scrap 1% GDP cap on defense spending,' *Nikkei Asia*, 20 May 2021, online; Lee Chi-dong, 'S Korea, US agree to end bilateral missile guidelines', *Yonhap News Agency*, 22 May 2021, online.

[4] Anne Barker, 'Philippine Foreign Minister takes profanity-laced crack at Beijing over its lingering presence in the South China Sea', *ABC News*, 4 May 2021, online.

[5] Peter Jennings, 'Quad shows promise but heavy lifting needed to meet China and Covid-19 challenges', The Strategist, 17 March 2021, online.

[6] Michael Shoebridge, 'The Chinese Communist Party's confected outrage machine', *The Strategist,* 14 October 2019, online.

[7] Roland Rajah, 'The big bark but small bite of China's trade coercion', *The Interpreter,* 8 April 2021, online.

[8] Tarric Brooker, 'China's Aussie coal ban backfire shows it doesn't know what it's doing', *news.com.au*, 10 January 2021, online. Of course, China will stop using Australian coal as soon as it possibly can through opening up new domestic supplies of coal in the short term, or moving to other energy sources in the long term.

[9] David Uren, 'No end in sight for China's dependence on Australian iron ore', *The Strategist,* 3 May 2021, online.

[10] Reserve Bank of Australia, Statement on monetary policy—May 2021. Box B: Supply chains during the COVID-19 pandemic', online.

[11] 'Statement on monetary policy—May 2021'.

[12] We'll see in Chapter 2 that that growth has the effect of making defence funding look significantly smaller as a percentage of GDP, even though that funding line isn't changing.

[13] International Monetary Fund, *International economic outlook: managing divergent recoveries*, April 2021, online.

[14] David Uren, 'Stimulus spending could cause the next economic crash', *The Strategist,* 17 May 2021, online.

[15] It will be interesting to see how Labor manages to differentiate itself from the government on economic policy now that the government has gazumped it on the big economic policy issues.

[16] Tony Wood, Guy Dundas, *Flame out: the future of natural gas,* Grattan Institute, November 2020, online.

[17] Atlas of Economic Complexity, online.

[18] Natasha Kassam, *Lowy Institute Poll*, Lowy Institute, Sydney, 24 June 2020, online.

[19] Within that, those who prefer 'very important' outnumber 'fairly important' 43% to 35%, although the balance appears to be slowly shifting to 'fairly important' over time.

[20] UN Development Programme, *Human development report 2020. The next fronter: human development and the Anthropocene,* online.

[21] John F Halliwell et al., *World happiness report 2021,* Sustainable Development Solutions Network, New York, 2021, online.

[22] That's plenty of time to go birdwatching once my final edition of *The cost of Defence* is done. World Health Organisation, 'Life expectancy and healthy life expectancy. Data by country,' 4 December 2020, online.

[23] Worldometers, 'Covid-19 coronavirus pandemic,' 23 May 2021, online. And many of the countries below us are perhaps not as comprehensive or rigorous in recording deaths and their causes.

[24] You can use the Open NEM widget to track electricity generation in real time, online. Giles Parkinson, 'AEMO says Australia "well ahead" of 90 per cent renewables scenario for 2040', *Renew Economy*, 10 May 2021, online.

[25] Our analysis focuses on the government's funding for Defence, known as the 'appropriation'. Defence also has funding from other sources, such as 'own source revenue', which includes funding it receives in return for the provision of services to its members (such as food at messes) or partners (such as fuel). In 2021–22, those other sources are around $1 billion. Generally, our analysis is based on appropriated funds but, sometimes, due to the presentation of the PBS, the numbers include own source revenue.

[26] Department of Defence (DoD), *Portfolio Budget Statements (PBS) 2021–22*, Australian Government, 2020, online.

[27] Those underspent funds from 2020–21 don't simply evaporate. They're accounted for in line 24 of PBS Table 1 'Appropriation carried forward'. Theoretically, they're funds that Defence could still draw on in 2021–22 with the agreement of the government, but they aren't part of Defence's funding line (line 5 of PBS Table 5) for 2021–22.

[28] Department of Finance, *Guide to appropriations (RMG 100)*, Australian Government, January 2021, paras 20, 69 and 70, online.

[29] There are two main reasons for this. The first is that the PBS shows only variations over the forward estimates. However, exchange rate adjustments extend indefinitely into the future, and Defence tracks them, so the shortfall in 2024–25 reflects an exchange rate adjustment made in 2020–21, when 2024–25 was still beyond the forward estimates. The second is that some variations are listed in the PBS as 'not for publication' due to commercial or national security sensitivities, so we can't see what their values are. Most of them seem to be 'absorbed'; that is, they're funded out of Defence's existing appropriation and therefore don't result in changes to the overall appropriation.

[30] Marcus Hellyer, *The cost of Defence: Part 1: ASPI 2020 Defence Strategic Update brief*, ASPI, Canberra, August 2020, online.

[31] Future sustainment isn't the total cost of sustainment in the future, or even the total cost of sustaining the new systems that Defence will acquire in the future. Rather, it's the difference between the predicted sustainment cost of new systems and the sustainment cost of the current in-service systems that they'll replace. That is, if the annual sustainment cost of a system is $100 million per year, and the predicted

sustainment cost of its replacement is $150 million, then the future sustainment cost is $50 million. It's difficult to determine how much of the $270 billion is acquisition spending and how much is future sustainment, but the bulk of it will be the former. By the way, new systems always cost more to operate than the systems that they're replacing. Always.

[32] The previous decade's growth was severely affected by substantial reductions in funding in 2012–13.

[33] Australian Government, *Budget paper no. 2: Budget measures 2021–22*, 2021, online.

[34] Significant measures in previous years listed as 'not for publication' have included the Pacific Step-up and the construction of shipyards at Osborn in Adelaide.

[35] The breakdown in PBS Table 4b shows the Department of Defence's planned *expenditure*, which draws on Defence's appropriation as well as Defence's own source revenue. That means it doesn't sum to the Defence line in PBS Table 4a, which is just Defence's appropriation.

[36] Technically, but not quite in an accounting sense. That's because the Capability Acquisition Program includes things that in an accounting sense are operating costs and, conversely, its Capability Sustainment Program includes items that in an accounting sense are 'capitalised'. Nevertheless, it's quick and easy to use the Capability Acquisition Program as Defence's capital budget, and *The cost of Defence* uses capital and acquisition interchangeably.

[37] However, due to changes made to the presentation of the PBS in 2020–21, it's now possible to see capital expenditure by group. It's provided in each program's (that is, each of Defence's groups' and services') cost summaries. We show those in Chapter 3.

[38] These numbers refer only to the Department of Defence and don't include ASD. They also include own source revenue, so they sum to line 15 of PBS Table 1, not line 5, which is the department's appropriation from the government.

[39] Defence is receiving $271.4 million in funding supplementation from the government to conduct operations, but the cost of its operations is $279.5 million.

[40] The 2020–21 Defence portfolio (the department and ASD) appropriation divided by 25,709,556, which was the Australian Bureau of Statistics' population clock prediction for Australia's population on 9 October 2020.

[41] It should be noted that service personnel costs are attributed to a member's parent service rather than the group where they're posted, so that means the Defence personnel costs of groups that have a large number of embedded service personnel (such as Strategy, Policy and Intelligence, Joint Capabilities, Australian Defence Force Headquarters, and Capability Acquisition and Sustainment Group) are understated.

[42] There's a brisk debate occurring in the US over whether a balanced funding split between the three services is appropriate for a military whose primary challenge is presented by China (see for example Paul Mcleary, 'DoD budget "bloodletting" inches closer to reality,' *Breaking Defence*, 19 February 2021, online). That's a debate we should be having too.

[43] That's because the PBS now shows each program's total capital expenditure. Previously it only showed depreciation of existing capital assets in each program's budget, not the acquisition cost of new ones.

[44] We've taken the data from each program's cost summary, using the lines 'Purchases of non-financial assets' and 'Purchases of inventory'.

[45] Department of Defence, *Operations*, Australian Government, 2021, online.

[46] Department of Defence, *Annual report 19–20*, Australian Government, September 2020, online.

[47] The Cost of Defence Public Database, ASPI, Canberra, online.

[48] Department of Defence, *Annual report 19–20*, Australian Government, September 2020, 119–120, online; Australian Public Service Commission, *State of the service report 2019–20*, Australian Government 2020, online.

[49] Estimates, 27 October 2020, 168, 172.

[50] Senate Standing Committee on Foreign Affairs, Defence and Trade, Legislation Budget Estimates, 26 and 27 October 2020, question 231.

[51] When do we think the future submarine's increasing spend will cross the F-35A's declining yearly spend and take the crown for top spot in the Top 30? I think the F-35A is safe for 2022–23 but will likely lose top spot in 2023–24. However, it's possible that the future frigate could actually be a dark horse and nab the top spot for a year or two as it starts actual construction before the submarine program. But once the future submarine gets there, it will stay there.

[52] The Cost of Defence Public Database, ASPI, Canberra, online.

[53] Parliamentary Standing Committee on Public Works, *Current inquiries*, Australian Parliament, 2021, online.

[54] This approach might upset accountants, but it's a useful way of presenting the budget to the rest of us.

[55] See Part 2 of2020–21's *The cost of Defence*, 42; Marcus Hellyer, 'Australia's defence budget in the age of Covid-19: unsustainable sustainment?', *The Strategist,* 23 June 2020, online.

[56] The Cost of Defence Public Database, ASPI, Canberra, online.

[57] Scott Morrison, 'Strengthening Australia's commitment to the Pacific,' media release, 8 November 2018, online.

[58] Josh Frydenberg, Mathias Cormann, *Mid-Year Economic and Fiscal Outlook 2018–19,* December 2018, 164–165, online.

[59] Defence portfolio PAES 2018–19, page 18, online. The PAES explained the justification for the step-up as follows: 'Since the release of the 2016 Defence White Paper, some strategic trends have accelerated—arguably faster than was anticipated when the White Paper was drafted. Defence responded to some of these trends, along with other agencies, in devising new measures under the Pacific Step-Up announced by Government in late 2018' (page 14).

[60] For example, 'The reprioritisation of the Integrated Investment Plan (IIP) was undertaken as part of the 2018–19 Mid-Year Economic and Fiscal Outlook Bi-Annual IIP Update, and addressed government priorities by identifying offsets to fund initiatives in the South West Pacific and South East Asia.' 2018–19 Additional Estimates, Foreign Affairs, Defence and Trade Committee, Defence Portfolio, response to question number 5.

[61] Estimates, 26 October 2020, 98–99, online. The exchange at Senate estimates was a little confusing and not entirely definitive, but, in response to Senator Wong's question, 'The $400 million for Pacific Step-up is over 5 years commencing in which financial year?', Defence responded 'The Pacific Step-up initiative commenced in the 2018–19 financial year.' So it didn't exactly say it was $400 million, but it didn't

exactly say it wasn't either. Foreign Affairs, Defence and Trade Committee, Defence portfolio, 2020–21 Budget estimates, response to question number 14.

[62] Foreign Affairs, Defence and Trade Committee, Defence portfolio, 2020–21 Budget estimates, response to questions number 183 and 215.

[63] The 2020–21 the budget papers stated 'The Government will provide $124.3 million over 10 years from 2020–21 for further infrastructure projects in the Southwest Pacific, including to construct a border and patrol boat outpost in Solomon Islands' western provinces. These construction projects will enhance Australia's long-standing security cooperation in the region, and expand Australia's existing Pacific Step-up measures.' 2020–21 Budget paper no. 2, 71. Defence has since provided the annual breakdown of the total number to the Senate: Senate Standing Committee on Foreign Affairs, Defence and Trade, Legislation Budget Estimates, 26 and 27 October 2020, answer to question on notice, 58.

[64] Marcus Hellyer, *The cost of Defence 2020–2021: Part 1: ASPI 2020 Defence Strategic Update brief*, ASPI, Canberra, August 2020, 35, online.

[65] Parliamentary Standing Committee on Public Works, *Current inquiries*, Australian Parliament, 2021, online.

[66] Acknowledgements to ASPI's spreadsheet wizard Albert Zhang for calculating these statistics.

[67] Slippage is handled slightly differently in the Estate and Infrastructure program, but the principles are the same. The slipped number for the military equipment program in PBS Table 5 is not the same as the final number in PBS Table 54 because the latter only includes the spend on Defence's approved projects whereas the former includes the planned spend on projects that are currently unapproved but will achieve government approval during the year. They don't make it easy…

[68] From 2012–13 to 2017–18 Defence did not provide actual achievement, but only a revised estimate in the PAES, so numbers for those years are approximate only.

[69] Senators Wong and Kitching are to be commended for the persistence of their questioning, and Defence's CFO for the comprehensiveness of the responses. Senate Standing Committee on Foreign Affairs and Trade, Supplementary Budget Estimates, 29 November 2019, response to question 125; Senate Standing Committee on Foreign Affairs and Trade, Additional Estimates, 4 March 2020, response to question 96.

[70] Scott Morrison, Linda Reynolds, Melissa Price, '$1B to accelerate Defence initiatives in COVID-19 recovery,' media release, 26 August 2020, online.

[71] Senate Standing Committee on Foreign Affairs and Trade, Budget Estimates, 26 and 27 October 2020, response to question 57.

[72] The Pacific Patrol Boat has disappeared from the PBS's Top 30 so we don't have visibility of its predicted spend for this year. We are assuming this year will be similar to 2020–21's $85 million.

[73] Linda Reynolds, 'Henderson Shipyard becomes sovereign capability powerhouse,' media release, 25 January 2021, online.

[74] Senate Standing Committees on Foreign Affairs Defence and Trade—Legislation, Budget Estimates, 26 and 27 October 2020, response to question 12.

[75] Australian Government, Department of Defence, *Capability Acquisition and Sustainment Group Project and Sustainment Report,* February 2021, pages 40–41, online.

[76] The first delay was reported in Australian Government, Department of Defence, 'Capability Acquisition and Sustainment. Quarterly Performance Report,' December 2019, page 14, online. The issues that led to the project being listed as a project of interest are redacted out of Defence's reporting that was released under a Freedom of Information request. Australian Government, Department of Defence, 'Capability Acquisition and Sustainment. Quarterly Performance Report,' June 2020, online; Australian Government, Department of Defence, 'Capability Acquisition and Sustainment. Quarterly Performance Report. Supplementary Reference,' June 2020, online.

[77] Department of Defence, 'Submarine, escape, rescue and abandonment system contract termination,' media release, 21 January 2021, online.

[78] Australian Government, Department of Defence, 'Project and Sustainment Report,' February 2021, page 12, online.

[79] Senate Standing Committee on Foreign Affairs and Trade, Estimates, 26 and 27 October 2020, pages 133–138, online.

[80] Marcus Hellyer, 'What's up with the Royal Australian Navy's weapons program?' *The Strategist,* 11 February 2021, online.

[81] Email from Defence Media, 5 May 2021.

[82] Defense Security Cooperation Agency (DSCA), 'Australia — CH-47F Chinook Helicopters,' news release, US Government, 29 April 2021, online.

[83] Linda Reynolds, 'Australian F-35A Lightning II achieves Initial Operational Capability,' media release, 28 December 2020, online.

[84] Nigel Pittaway, 'Defence provides update on Hornet disposal plans,' Australian Defence Magazine, 7 May 2020, online.

[85] DoD, 'AIR7003 Phase 1 MQ-9B SkyGuardian armed remotely piloted aircraft system', Australian Government, December 2020, online.

[86] Defense Security Cooperation Agency (DSCA), 'Australia — MQ-9B Remotely Piloted Aircraft,' news release, US Government, 23 April 2021, online.

[87] Linda Reynolds, 'Cutting edge remotely piloted platform chosen in billion dollar project,' media release, 28 November 2019, online.

[88] Marcus Hellyer, Loyal wingman's first flight shows fourth industrial revolution in defence capability has arrived,' *The Strategist*, 3 March 2021, online; Malcom Davis, 'Loyal wingman leads the way to the RAAF of 2121,' The Strategist, 5 March 2021, online.

[89] Andrew McLaughlin, 'Loyal Wingman makes successful first flight,' ADBR, 2 March 2021, online.

[90] Linda Reynolds, 'Two more P-8A Poseidon aircraft boost maritime patrol capability,' media release, 30 December 2020, online.

[91] Email from Defence media, 18 January 2021.

[92] QPR, February 2021, 34–35, online.

[93] QPR, February 2021, 13, online.

[94] Department of Defence, *Lead the Way: Defence Transformation Strategy,* Australian Government, 2020, online.

[95] Marcus Hellyer, *Cracking the missile matrix: the case for Australian guided weapons production*, ASPI, Canberra, 2021, online.

[96] Linda Reynolds, 'Australia collaborates with the US to develop and test high speed long-range hypersonic weapons', media release, 1 December 2020, online.

[97] There's an interesting debate to be had about the value for money of long-range missiles versus bombers. The latter are eye-wateringly expensive. The US Air Force is aiming to keep the cost to under A$1 billion per B-21, which is still huge. Missiles might seem to be better value, but they're also a very expensive way to deliver high explosive, and the longer you want them to fly and the bigger the warhead, the more expensive they are. Depending on how many weapons you think you'll need to launch or how many missions you'll need to fly over the life of the bomber, a capable bomber delivering cheap weapons could be substantially better value than a lot of missiles. Of course, advances in precision guidance technologies mean that, at this point in time, the pendulum has swung firmly towards offence, as you only need one aircraft or a small number of missiles to deliver the same effects that required squadrons of aircraft a generation or so ago. So, both approaches are significantly better value for money as a way to impose greater cost at greater range than building $3 billion floating targets. See Mark Gunzinger, *Long-range strike: resetting the balance of stand-in and stand-off forces,* Mitchell Institute for Aerospace Studies, Arlington, 2020, online; Thomas Hamilton, *Comparing the cost of penetrating bombers to expendable missiles over thirty years*, RAND Corporation, Santa Monica, 2010, online.

[98] Defence probably spends on R&D outside of the innovation programs but, when ASPI asked Defence what it spends on R&D, its response was $3 billion over the decade, which simply repeats the number in the FSP. So, it's not clear whether Defence actually knows what it's spending on R&D outside of the innovation programs.

[99], Defence Innovation Hub, 'Industry information guide', version 1, Australian Government, November 2020, online.

[100] Albert Palazzo, 'Crossing 2000 kilometres of death'. Land Power Forum, Australian Army Research Centre, 17 September 2019, online.

[101] The cost of a structure designed to meet the needs of constant operations has been identified by a practitioner as follows: 'The Australian Army must adapt current routines to not only the circumstances of today but also the challenges of the future. The stability of sustaining virtually continual operations in the Middle East since 2001—where a systematic process of force preparation, deployment and redeployment defined the Army's daily business—is now over. The Army's "force generation cycle", matched with the standardisation of Army's three full-time brigades and a consistent approach to individual and collective training, was an ideal way to establish operational readiness. It ensured the Army could systematically provide highly capable and ready forces for planned deployment rotations, while maintaining a capacity for minor operations at short notice. However, as successful as the "force generation cycle" has been, this approach to preparedness has had significant costs. These costs will make it difficult for the Army to sustain this preparedness approach during the next decade.' David Beaumont, *An uncertain and dangerous decade: preparing the Army for the next ten years*, Australian Army Research Centre, Canberra, 2020, page 19, online.

[102] Marcus Hellyer, *From concentrated vulnerability to distributed lethality—or how to get more maritime bang for the buck with our offshore patrol vessels*, ASPI, Canberra, 2020, online.

[103] The term 'the smart, the small, and the many' is one I have shamelessly appropriated from the work of Professor Jason Scholz.