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# The Cost of Defence 2020–2021

## Part 1: ASPI 2020 Defence Strategic Update Brief



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One hundred & fifty-seven million, four hundred & thirty-nine thousand, four hundred & eighty-five dollars & twenty-one cents per day



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*Note on title: The figure of \$157,439,485.21 represents the daily average of the 10-year defence funding line (including the Australian Signals Directorate) of \$574,969 million presented in the 2020 Defence Strategic Update for the decade 2020-21 to 2029-30.*

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## Executive Director's foreword

2020 has been a year like no other. It's not surprising, then, that ASPI's *The cost of Defence* this year is also like no other—we're publishing it in two parts. The first, this one, focuses on the government's recent Defence Strategic Update and its supporting Force Structure Plan.

While the Defence Strategic Update might not be called a White Paper, it has the policy heft of one. It contains several significant adjustments to the government's defence policy that acknowledge and address Australia's very uncertain strategic circumstances. Moreover, despite the economic uncertainty created by the pandemic, the update locks in a robust funding line for Defence for the next 10 years. It may not be the 3% of GDP that some, including me, have been advocating for, but it's probably as good as anyone could hope for right now.

The update doesn't have the same level of detail on dollars as there is in the annual Portfolio Budget Statements, but it sets the parameters for defence budgets for the next 10 years.

Overall, we believe that there's more than enough in the Defence Strategic Update to warrant a dedicated edition of *The cost of Defence*. Since some traditions can't change, no matter what, we'll still cover the 2020–21 defence budget in part 2 in October.

We're also launching ASPI's *The cost of Defence* database. This will make available to researchers, analysts, the defence industry and the general public much of the data relating to the cost of defence that ASPI has collected over the past 19 years. We'll continue to add to the database and are very happy to take your suggestions on what you'd like to see there. You can access it through our website.

Marcus Hellyer, the report's author, was ably assisted by research intern Albert Zhang in the preparation of the report.

I hope you remain safe in these difficult times.

**Peter Jennings**

Executive Director

## Executive summary

The Defence Strategic Update (DSU) represents a remarkable commitment by the Australian Government to sustained growth in the defence budget. Released on 1 July after months of bad economic news caused by the Covid-19 pandemic and growing budget deficits caused by the government’s measures to mitigate the economic pain, the DSU nevertheless confirms the robust funding line presented in the *2016 Defence White Paper* (2016 DWP) and extends it for a further four years. This means the defence budget will continue to grow past 2% of GDP, and indeed at a faster rate than before the Covid-19 pandemic hit. Measured from a starting point in 2019–20, the budget is planned to grow by a remarkable 87.4% over the coming decade.

Why did the government make that commitment? It’s clear from the DSU that it’s very concerned about Australia’s strategic circumstances, which it assesses as having deteriorated significantly in the four years since the 2016 DWP. It states that the region is in the middle of the most consequential strategic realignment since World War II. That brings significant uncertainty and risk. The government regards robust military capabilities as essential to managing it.

The DSU marks a clear break from previous high-level strategic statements in the frank way it describes those risks and the new capabilities needed to address them. It also makes several key adjustments to strategic policy settings:

- It redefines our immediate region to an arc from the northeastern Indian Ocean, through maritime and mainland Southeast Asia, to Papua New Guinea and the Southwest Pacific. It’s still a huge area.
- It prioritises the immediate region for defence planning.
- It introduces the concepts of ‘shape’, ‘deter’ and ‘respond’ to focus defence planning. The emphasis on shaping reinforces the importance of regional engagement and partnerships in creating a region conducive to our interests.
- It states that a largely defensive force won’t deter attack. Instead, ‘new capabilities are needed to hold adversaries’ forces and infrastructure at risk from a greater distance. They include longer range strike weapons, cyber measures and area-denial systems.’
- It acknowledges that Australia can no longer rely on warning time, even for a conventional military attack on Australia, and so won’t have time to ‘gradually adjust’ military capabilities.

While the redefinition of the immediate region might not in itself result in changes to the defence investment program—now known as the Force Structure Plan (FSP)—the other factors listed certainly will.

Defence funding (including Australian Signals Directorate) over the coming decade	
<b>The decade</b>	
Total defence funding:	\$575 billion
Planned nominal growth:	87.4%
<b>2020–21 funding</b>	
Defence funding:	\$42.2 billion
Share of GDP:	2.22%
Real growth on prior year:	5%
<b>Expenditure shares, 2020–21</b>	
Acquisition:	\$14.4 billion (34%)
Personnel:	\$13.5 billion (32%)
Operating:	\$14.2 billion (34%)
<b>Planned 2029–30 funding</b>	
Defence funding:	\$73.7 billion
<b>Expenditure shares, 2029–30</b>	
Acquisition:	\$29.2 billion (40%)
Personnel:	\$19.2 billion (26%)
Operating:	\$25.3 billion (34%)

To acquire new capabilities, the growth in the DSU's funding model continues the pattern of the 2016 DWP. That means the capital component of the budget grows to 40% of the total budget and stays there. That's a far higher percentage than has historically been the case. By the end of the decade, if that planned increase is achieved, the acquisition component of the budget will have grown by 148% in nominal terms from its 2019–20 start point.

Despite the broader economic and budget uncertainty, this means that Defence is in the fortunate position of being able to add some significant new capabilities to its shopping list. Perhaps the most remarkable feature of the FSP is that the ADF has entered the 'age of missiles' with a vengeance. There's potentially \$100 billion in investment over the next two decades in missiles and guided weapons. That includes the offensive systems needed to deter and defeat an adversary from a greater distance, such as hypersonic weapons. Even the Army is acquiring long-range missiles. But it also includes greatly enhanced defensive systems, such as ballistic missile defence, which is something Defence has considered for a long time but never previously committed to. That's a clear sign that the region is getting much more dangerous.

While the FSP is short on detail, the big picture it paints is pretty clear. It's one in which the ADF continues its trajectory of steadily fielding improved capability and developing greater strategic weight. But there are risks, both in the design of the plan itself and in delivering it, that need to be managed. It must be said that Defence's planning processes are improving along with its costing methodologies, so it's likely that these are risks that it has considered in the development of the DSU and FSP.

The first set of risks relates to the question of whether this is the right force for our deteriorating circumstances. Despite the recognition that Australia can't rely on warning time, much of the planned force is still a long way off in the future. The first future frigate won't be operational for 10 years and the first future submarine for 14, and subsequent vessels are to be delivered only on a two-year drumbeat. The Air Force isn't getting additional air combat aircraft beyond its 72 F-35As until late in the decade.

Most of the major new additions to the force structure are also some way off in the future. There's a funding line that potentially provides a way forward to get Boeing's Loyal Wingman unmanned aerial vehicle into service, but most of the big buckets of funding for unmanned and autonomous systems are still late in the 2020s or even in the 2030s. Until then, it looks like Defence is relying on improved weapons delivered from existing platforms to provide the main capability enhancement.

Also, the force envisaged in the DSU and FSP is growing increasingly broad. There are many new capabilities in the plan, but virtually none are being retired or cancelled. Similarly, the range of tasks that the force is being asked to do isn't being reduced. In fact, the DSU requires greater regional engagement as well as greater capacity for domestic disaster response—but will the force be able to do all the tasks expected of it?

Related to this, our changing strategic environment seems to be pulling the force in two directions. The DSU states that we can't match major-power adversaries and need to develop capabilities to deter them through strike, cyber and area-denial systems. This suggests a growing recognition of the need for asymmetric operational concepts and capabilities, yet the force is still largely being built around traditional, conventional capabilities such as expensive, multi-role, manned platforms of the kind Australia has relied upon to overmatch potential adversaries. Defence is also investing in an increasingly heavy conventional land force. That's likely to be useful against some potential non-peer adversaries—but does it play a deterrent role against a major-power adversary?

There's also the question of balance between acquisition, sustainment and personnel funding. Acquisition's share of the budget is growing rapidly. Personnel's share is also growing but more slowly, and will decline as a percentage of the overall budget. The DSU states that the government will consider increases to Defence's workforce next year, but those numbers are already accounted for in the DSU's personnel funding stream,

suggesting that any additional people won't change the overall trajectory of personnel's share of the budget. Certainly, increased capital spending is necessary, but is a 40% acquisition / 26% personnel balance feasible in the long term? There's no point acquiring equipment you can't crew.

Then there are a set of risks that relate to the feasibility of delivery. The first, as ever, is money. The economic future of both Australia and the world is still very uncertain. If the economic impact of Covid-19 results in prolonged economic stagnation, it's going to take sustained resolve by this and future governments to keep increasing defence funding over the decade. Should that resolve waver and a government revert to something like 2% of GDP, that would be a huge hit to the defence budget of potentially \$5–10 billion per year, with a resultant cut to either existing core capabilities or the planned new ones.

The government has already stated that it's committed to Defence's 'megaprojects' and that they aren't part of any prioritisation or trade-off process, so other things will bear the brunt of any funding hit—potentially, the new asymmetric capabilities being introduced to deter a major-power adversary.

Then there's the very difficult question of the affordability of the force. The defence budget is growing substantially, but so is the list of capabilities Defence is acquiring and sustaining. The acquisition cost of military capabilities grows much faster than inflation. Since 2016, several key capabilities have grown significantly in cost (including submarines, frigates, armoured vehicles and air defence). Moreover, sustainment costs are also growing. The sustainment cost of key future capabilities is likely to be several times greater in real terms than the systems they're replacing.

One of the biggest implementation risks relates to Australian industry's ability to scale up to deliver the force. The local share of Defence's capital equipment spend has consistently hovered around one-third of the total. Last year, that was around \$2.6 billion. As the capital budget rapidly grows over the decade, local acquisition spending will have to grow to over \$7 billion per year just to maintain that one-third share. But it's clear the government wants that share to grow. It has to, if we're going to address the supply-chain risks currently inherent in defence capability. Getting to between 40% and 50% means the local acquisition spend will need to reach around \$10 billion per year. That's a lot of money for Australian industry to absorb and a lot of capability for it to deliver, but, if it doesn't get there, the government won't achieve the level of sovereign capability that it's seeking and we'll continue to rely on imported systems, with the attendant supply-chain risks.

While the basic settings of the government's 2016 defence industry policy statement are the right ones, it's likely that it's going to have to do more to develop the kind of local industrial ecosystem necessary to deliver the level of sovereign capability described in the DSU and FSP. Relying on the local assembly of foreign designs using mainly foreign high-value subsystems isn't going to get us there. More needs to be done to generate technological innovation and advanced manufacturing here. There are only minor increases to innovation funding in the DSU, for example. The new line in the FSP to develop sovereign weapons manufacturing could be a model for a more deliberate approach to generating sovereign industrial capability.

The other risk associated with industry policy is the old one of falling into the trap of preferring industrial outcomes to military capability. That risk has already been realised. Some of the hidden costs of continuous-build programs are becoming more apparent: the FSP states that the cost increase for the Future Frigate Program was caused by the government allocating 'additional funding to enable construction of ships at a deliberate drumbeat over a longer period of time than originally planned to achieve a continuous shipbuilding program'. That is, we're deliberately paying more to get capability later.

The DSU acknowledges that we can no longer rely on warning time to be able to gradually adjust military capability, so surely now's the time to be spending to *accelerate* delivery and the rate at which we 'adjust capability', not slow it down. If we're willing to pay a premium to build here, let's pay it to get more capability



sooner, not later. Why are we prioritising jobs for future generations of shipbuilders over capability for current servicemen and women who may be called upon in the near future to use it?

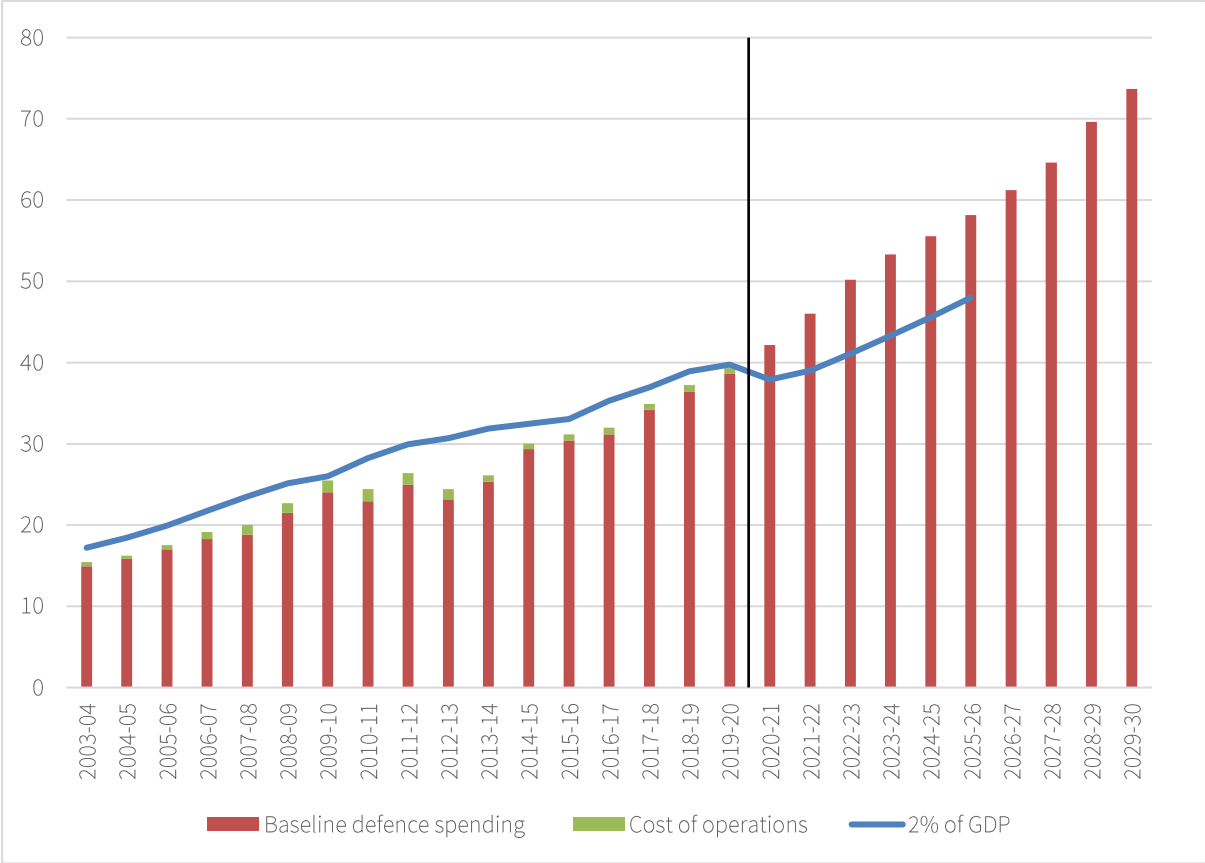
The new strategy has been written, and the government most certainly understands the urgency driving its defence policy changes. The key question is whether Defence can sufficiently internalise that urgency to implement the changes needed in how the organisation does business. The Minister for Defence, Linda Reynolds, stated on 7 August that ‘the Defence Department ... has systematically for over 100 years failed to deliver on the government’s expectations of the enterprise.’<sup>1</sup> We now have a plan that calls for speed, lateral thinking, innovation and partnerships—to be implemented by an organisation that’s slow, subject to groupthink, risk averse and reluctant to reach out. Adapting Defence to the demands of our new reality is going to be challenging, to say the least.

# The Defence Strategic Update in eight tables

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

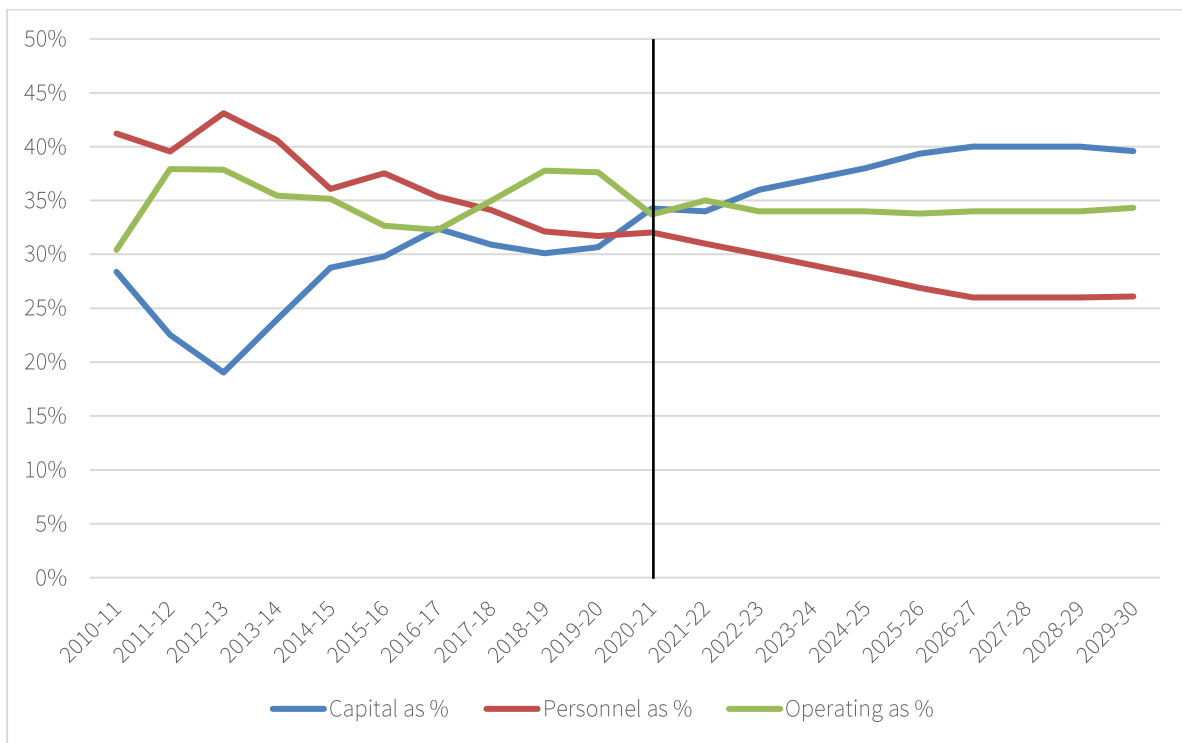
## Defence funding over the coming decade

Figure A.1: The Australian defence budget to 2029-30 (nominal \$b) (see Chapter 2)



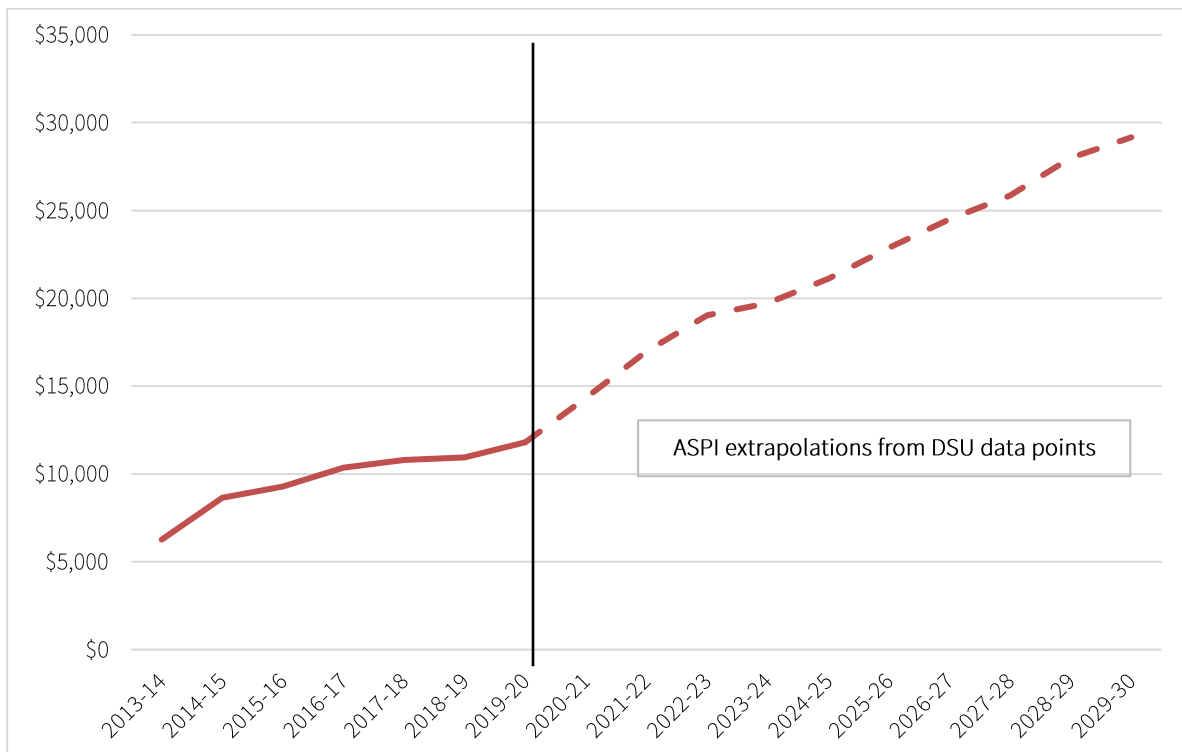
Sources: Historical data from Defence PBS and Budget papers; spending for 2020-21 – 2029-30 from DSU; 2% of GDP from 2021-22 to 2025-26 is a hypothetical ASPI projection assuming a ‘rapid’ post-Covid-19 recovery.

Figure A.2: Balance of the defence budget, 2010-11 to 2029-30 (%) (see Chapter 2)



Source: previous ASPI budget briefs, derived from PBS.

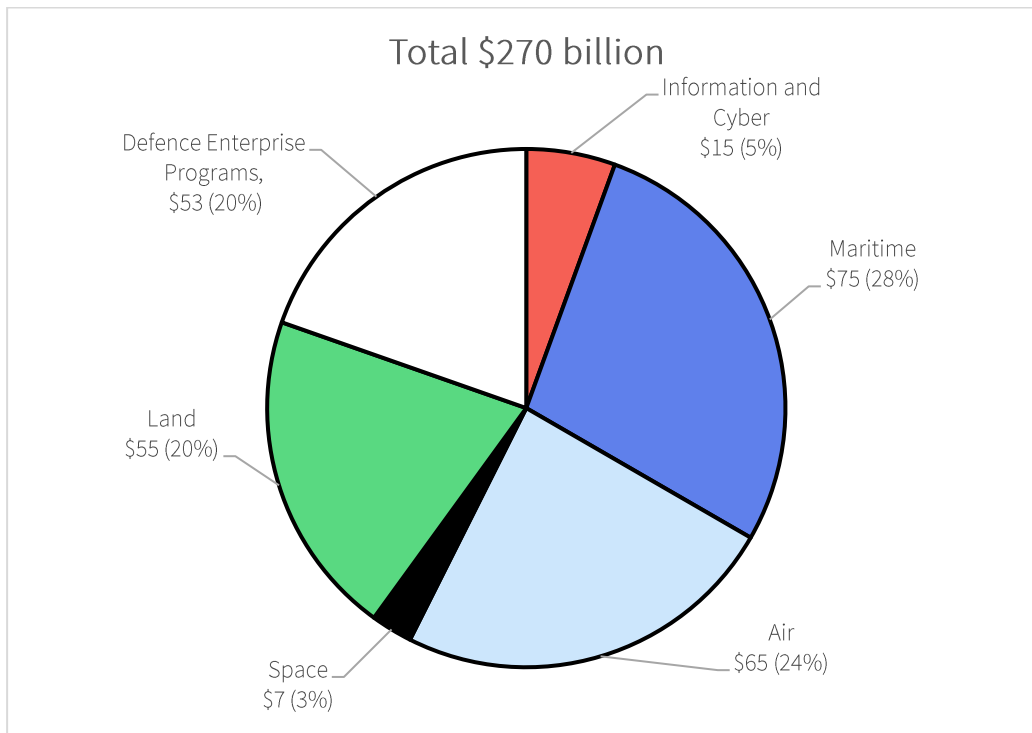
Figure A.3: Capital program budget (\$ million) (see Chapters 2 and 5)



Source: 2020 DSU 'Defence budget' factsheet, [online](#).

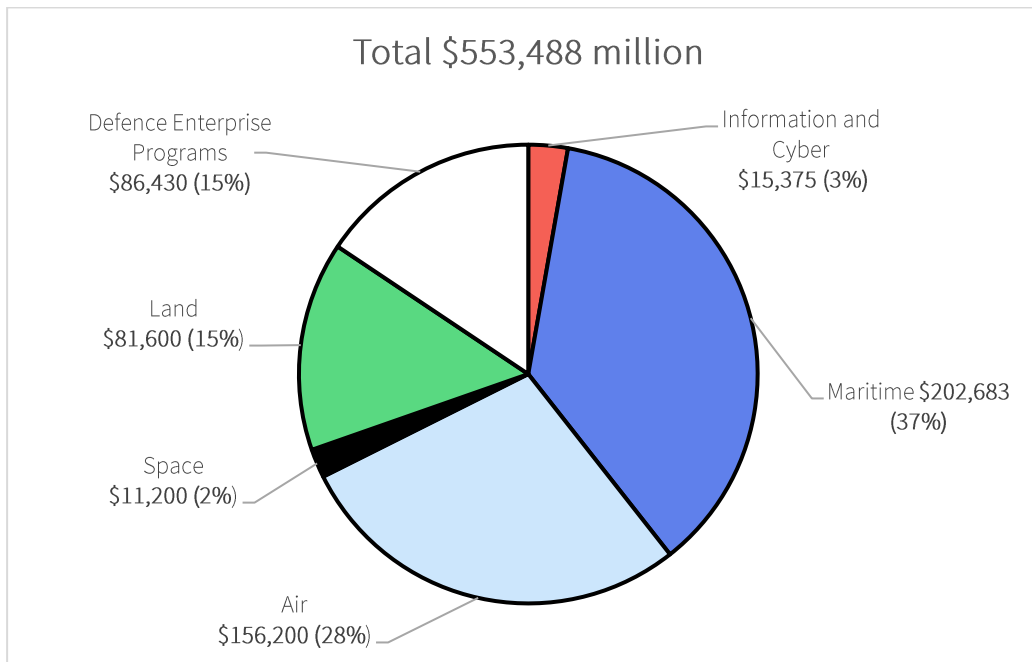
## Spending by domain

Figure A.4: Capability investment by domain, 2020-21 to 2029-30 (\$ billion) (see Chapter 3)



Source: 2020 FSP. 'Capability investment' includes acquisition and future sustainment spending.

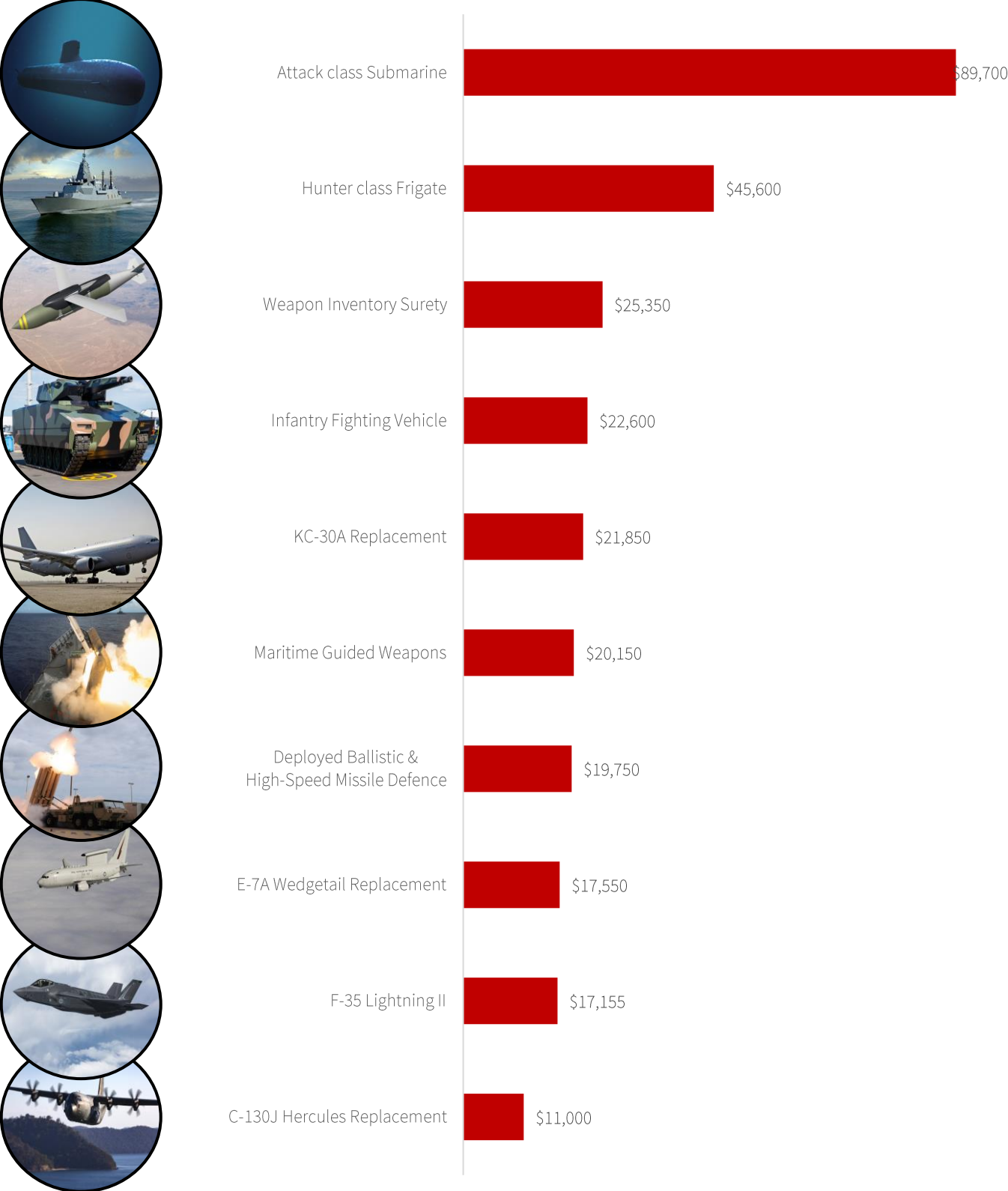
Figure A.5: Value of investments within each of 2020 Force Structure Plan's domains, 2020-21 to 2039-40 (\$ millions) (see Chapter 3)



Source: 2020 FSP. Figures are based on the median point of FSP investment bands. Virtually all of them contain only acquisition spending and no sustainment. The FSP notes that some investment lines start before 2020-21 or extend beyond 2039-40.

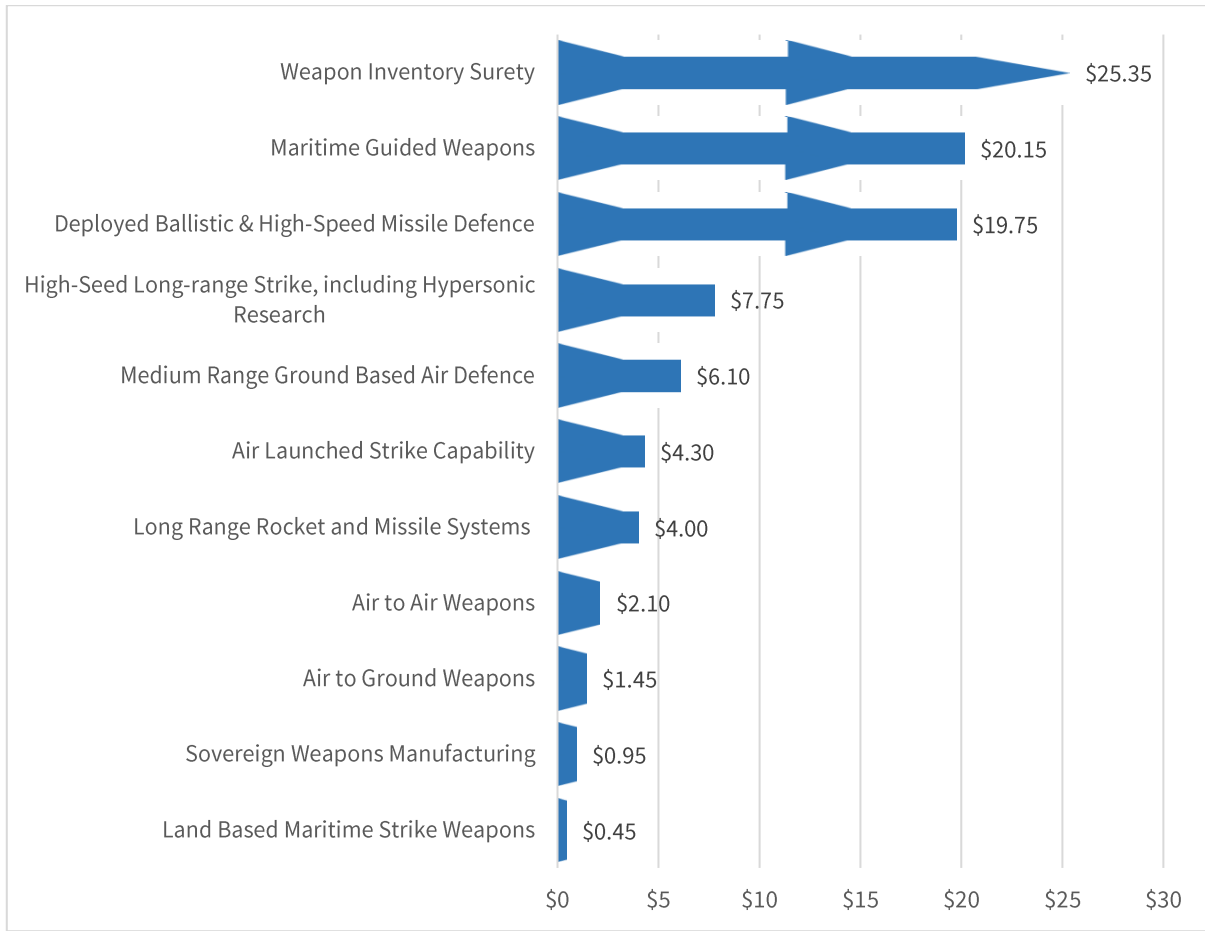
# Key capability investments

Figure A.6: Top 10 Defence Program Investments (\$ million) (see chapters 3 and 4)



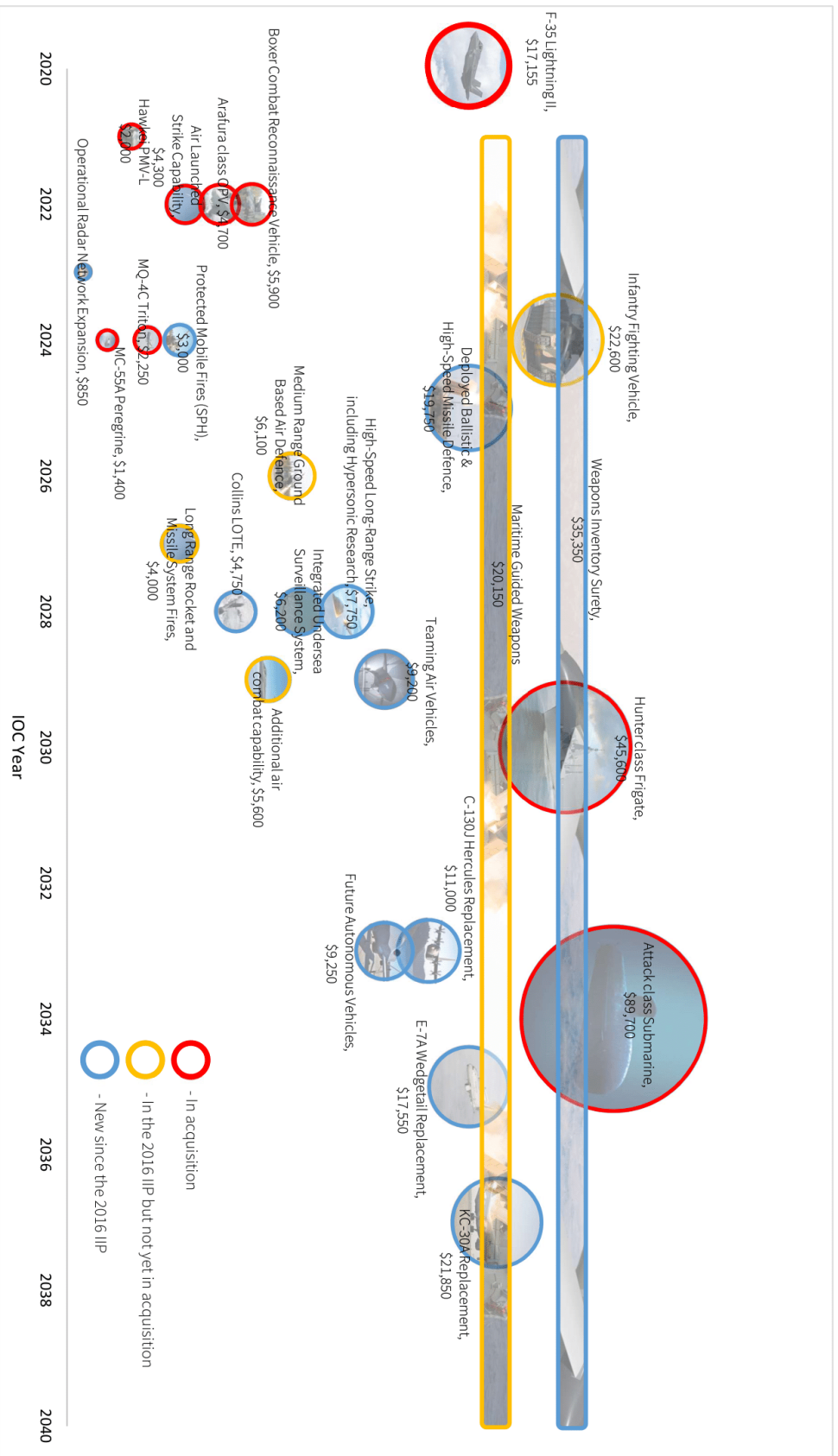
Source: 2020 FSP.

Figure A.7: Planned investments in missiles and other guided weapon systems (median point of FSP bands, \$ billion) (see chapters 3 and 4)



Source: 2020 FSP.

Figure A8: Schedule of significant defence capability investments by initial operating capability (bubbles sized by median point of FSP budget band, A\$ millions)



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.

## Chapter 1: The strategic settings

### Key points

- The 2020 Defence Strategic Update addresses Australia’s uncertain strategic circumstances with a new directness and announces several major adjustments to strategic policy.
- The DSU states that Defence’s focus must be on our immediate region—an area that it defines in an expansive way. The new definition is in itself unlikely to result in wholesale changes to force structure.
- However, key additions to the force structure do result from the DSU’s new emphasis on offensive capabilities such as long-range strike, which are intended to impose greater cost and risk on adversaries at greater range from Australia.
- Its use of the concepts of *shape*, *deter*, *respond* presents the ADF as an everyday tool of government, actively working to create an environment conducive to our interests. Working with regional partners is central to this; Australia isn’t going it alone.
- The DSU explicitly states that we can no longer rely on warning time in order to prepare for crisis and conflict. Nevertheless, the delivery of many key capabilities is still some time off.

### 1.1 The 2020 Defence Strategic Update

#### Where it came from

The 2020 Defence Strategic Update (DSU) released by the government on 1 July this year may have only the humble title of an update, but, in stating new policies, it ranks up there with this century’s defence white papers (DWPs). In fact, in repudiating old certainties, it exceeds them.

We’ve known since October last year, when Minister for Defence Linda Reynolds stated that the 2016 DWP had underestimated the speed of change in the region, that the government wasn’t satisfied with the policy settings in that document. The government directed Defence to do a ‘thorough re-assessment of the strategic underpinnings of the 2016 Defence White Paper’ and analyse any necessary adjustments to capability requirements. However, this was not to be a blue-sky, back-to-the-drawing-board, do-over from first principles. The minister also stated, ‘I do not envisage any changes to our major capability programs. Advanced frigates and a regionally superior submarine will be a part of our future force.’<sup>2</sup>

It’s not surprising, then, that what that review produced—the DSU—reflects both of those drivers; there’s significant new strategic policy and there are significant new capabilities in the Force Structure Plan (FSP) that accompanied the DSU, but the megaprojects are untouchable, so there are limits on how much the force can be changed.

#### A new directness

There’s a new directness in the DSU. In contrast to the prediction of a relatively benign future in the 2013 DWP, there’s a clear sense of declining security and stability.<sup>3</sup> While the 2016 DWP had the mandatory language about uncertainty and unpredictable change that characterises such documents, the DSU is qualitatively different.<sup>4</sup> For example, it states that:



major power competition, coercion and military modernisation are increasing the potential for and consequences of miscalculation. While still unlikely, the prospect of high-intensity military conflict in the Indo-Pacific is less remote than at the time of the 2016 Defence White Paper, including high-intensity military conflict between the United States and China. (page 14)

The Prime Minister's launch speech went even further, using comparisons to the collapse of global order and the existential threat we faced in the 1930s and 1940s.<sup>5</sup> It's almost the language of crisis.

The DSU contains several significant defence policy adjustments. They might not be completely unprecedented, but the language in the DSU is much more robust and active. It's not gratuitously provocative, but much of the studied diplomatic hedging in previous strategic statements that says nothing to anybody for fear of upsetting somebody is gone. It calls a spade a spade. The change in tone is in itself one of the key strategic shifts here.

## 1.2 Redefining our immediate region

### Where is it?

Australian DWPs have traditionally taken a 'concentric rings' approach to Australia's strategic interests. Those rings are generally, if not quite strictly, geographically based. Rings closer to Australia are assigned greater weight in shaping the design of the ADF.

The 2009 DWP, for example, had four strategic interests, which largely coincided with distance from Australia. They moved outwards from 'a secure Australia', to 'a secure immediate neighbourhood' (which included Indonesia, Papua New Guinea, East Timor, New Zealand and the South Pacific island states), to 'strategic stability in the Asia-Pacific Region' (particularly the security of Southeast Asia), and finally to 'a stable, rules-based global security order'. What this meant for force design was that:

the ability to deter or defeat armed attack on Australia will continue to be the primary force structure determinant of the ADF. ... this means focusing predominantly on forces that can exert air superiority and sea control in our approaches. (page 49)

The 2016 DWP paper broke from that approach. Its three 'strategic defence interests' were still essentially based on concentric rings: 'a secure, resilient Australia, with secure northern approaches', 'a secure nearer region, encompassing maritime Southeast Asia and the South Pacific' and 'a stable Indo-Pacific region and a rules-based global order' (page 68), but all three were to be taken into account 'to guide force structure and force posture decision making'.

The DSU returns to the traditional approach of prioritising the near region, stating that 'defence planning will focus on our immediate region' (page 6). But this 'immediate' region isn't the old air-sea gap, maritime approaches or close neighbours such as Papua New Guinea and Timor-Leste. The new immediate region is very large, in fact nearly as large as the 2009 DWP's three inner rings combined. It now ranges 'from the north-eastern Indian Ocean, through maritime and mainland South East Asia to Papua New Guinea and the South West Pacific' (page 6).

### Will it help prioritisation?

The DSU optimistically pronounces that 'this new framework will provide a tight focus for defence planning and alignment with broader initiatives such as the Pacific Step-up' (page 6). Moreover, 'this will have implications for Defence capability and force structure. It will mean adjustments to the plans set out in the 2016 Defence White Paper so that we are prepared for the challenges we are most likely to face.'

But, of course, it isn't that simple. Stating where you're willing to operate doesn't determine what you acquire; what does determine it is what you want to be able to do there. The region is big enough and diverse enough to justify any capability, from boots to aircraft carriers. Or, put another way, what capabilities does this definition of 'immediate region' rule out?

Let's take my favourite whipping boy, LAND 400 Phase 3, which is to acquire around 450 tracked infantry fighting vehicles (IFVs), each of around 40 tonnes. The new immediate region is largely archipelagic, much of it having poor infrastructure, such as roads and bridges incapable of supporting those vehicles, as well as terrain not well suited to armour. Moreover, the IFVs would need to be transported there by sea and sustained by a seaborne logistics trail, potentially in the face of the advanced anti-ship threats, such as missiles and submarines, that the DSU notes are proliferating in the region.

If you were prioritising purely on the basis of geography, LAND 400 Phase 3 would appear to be a prime candidate for a reduction in priority. And yet its budget has ballooned by 80%, from \$10–15 billion in 2016 to \$18.1–27.1 billion in the new FSP. The Army's justification for the capability is along these lines: 'If you want us to be able to operate in complex terrain, then we need heavily protected vehicles such as IFVs.' Complex terrain basically means cities, and there's certainly no lack of cities in the region.

Since the DSU doesn't provide detail about what the government wants Defence to do, or how Defence intends to operate (other than through an array of abstract nouns and adjectives such as 'agile', 'joint' etc.) it's hard to know whether the capabilities in the shopping list are the right ones. Rather, we have to reverse-engineer what the government wants Defence to do from the shopping list. Because the government has decided to invest \$18.1–27.1 billion in IFVs, \$5.0 billion in combat reconnaissance vehicles, \$4.5–6.8 billion in self-propelled howitzers and \$8.0–11.9 billion in a tank replacement, we can only conclude that it does want Defence to have the ability to conduct land operations in complex terrain in places such as Southeast Asia.

But complex terrain in Southeast Asia is basically the same as complex terrain in other parts of the world. It's not clear that there's anything in particular about the nature of complex terrain in our immediate region that's led to the quantitative or qualitative requirements for LAND 400 Phase 3.

Put another way, if geography determines force structure, you would expect to see significant changes in force structure resulting from the change in geographical prioritisation over various DWPs. But there are none. Refocusing on the 'immediate region' hasn't resulted in the FSP giving anything up. That's partly because there was nothing of any major significance in force structure anyway that was just there for operations in the Middle East or North Asia or Europe or Africa. And it's partly because the immediate region is still so huge that capabilities you need to project to the Middle East are the same ones you need to project within the region. If you want to move a lot of big, heavy stuff quickly to Fiji, you still need C-17s. The bottom line is that the ADF structures itself on the basis of what it does, not where it does it.

So, geographical concepts such as 'immediate region' don't help with prioritisation in force design (at least in the way Defence practises it). It's a useful way of signalling where the government is willing to *use* the ADF, and the Prime Minister did some pretty emphatic signalling in his launch speech, but that's a different matter from force design. And it certainly helps Defence focus its experimentation. But don't expect wholesale change in the force structure because of the DSU's new definition of the region.

At least the new definition renders the endless debates about 'defence of Australia' versus 'forward defence' irrelevant. The battlegrounds of both concepts, real and imagined, sit squarely within the immediate region.

## 1.3 Shape, deter, respond

### New objectives

Another new twist in the DSU is how Defence's objectives are defined. The government has stated that the DSU 'provides a new strategic policy framework to ensure Australia is able—and is understood as willing—to deploy military power to shape our environment, deter actions against our interests and, when required, respond with military force' (page 6). The DSU defines the terms 'shape', 'deter' and 'respond' as 'objectives' (for example, page 24).

There are strengths and weakness to this. One weakness is that shape, deter, respond are hardly objectives. Objectives are things you aim to achieve by doing. 'When required, respond with credible military force' (page 6) isn't an objective; it's what you do to achieve an objective, such as defeating an adversary's aggression, undoing their military gains, or destroying their force projection capabilities. This may seem to be semantic quibbling, but the point is that these 'objectives' are so broad that it's hard to see how they're of much use in developing a force structure or prioritising investment in one capability over another. There's not much Defence could conceivably do or acquire that wouldn't fit into those categories, so, like geography, what do they rule out of the force structure? Defence has a more detailed prioritisation framework built around particular tasks, but it's opaque to outside observers. For the public, it's hard to trace the golden thread of logic from strategic objective to capability investment.

### Shaping

That said, the emphasis on *doing* is useful, particularly placing 'shape' in the same category as 'deter' and 'respond'. This reinforces the idea that the ADF isn't just a 'break glass in case of emergency' capability. Rather, it's a tool of government that can be constantly used to create a regional environment conducive to our interests.

Shaping is primarily about doing things. Arguably, the purpose of making shape a priority of equal standing to deter and respond is to raise the emphasis on engagement. That isn't just with the US, but with a broad range of partners. Generally, defence forces don't have capabilities specifically for shaping activities, such as regional engagement—you take your core ships, aircraft and units to regional exercises to learn how to work with others. The challenge is in making sure you have enough of them to support an active engagement program.

So there's not a lot of investment in the FSP in capabilities that fall solely within 'shaping', although one could argue that the elements of the Pacific Step-up are in that category, such as Pacific patrol boats and the Pacific support ship. In the grand scheme of things, they're relatively small money. The DSU also discusses the expansion of the Jindalee Operational Radar Network to cover Australia's eastern approaches under 'shaping', but that capability also makes a clear contribution to 'deterring' and potentially to 'responding'.

And strong policy statements like the DSU backed up with funding to acquire capabilities to deter and respond are themselves powerful shaping forces.

### We're not going it alone

While we're on the subject of working with others, let's put one misconception that's already arisen back to bed. Despite some assessments in the commentariat, nowhere does the DSU state or signal that Australia is preparing for going it alone in a conflict against China. Certainly, it contains an overdue recognition of the changing power balance in the Indo-Pacific, but it's not stating that we've moved into a completely anarchic world of every state for itself in which Australia can't develop and strengthen relationships with other countries.

In particular, the US–Australia alliance will continue to be fundamental to Australia’s strategic policy settings. In fact, the DSU ‘will continue to deepen Australia’s alliance with the United States’ (page 7). If there was any doubt about that, since the launch of the DSU the ministers for Defence and Foreign Affairs have flown to the US to meet with their counterparts in person, despite the requirement to go into isolation on their return. This was the first time that Australian federal ministers have gone overseas since the start of the Covid-19 crisis.

Figure 1.1: A RAAF KC-30A multi-role tanker transport aircraft refuels a US Air Force B-1 Lancer aircraft above Guam as part of an Australia–US interoperability mission during a regional presence deployment



Source: Defence Image Library.

## 1.4 The best defence ...

### New capabilities to impose cost and risk

Deter and respond are two sides of the same coin. A deterrent is only effective if a potential adversary believes that you’ll use it and that, if you do, it will impose real cost. This is where the focus of Defence’s investment has always been. One of the most striking shifts in both language and policy is a clear statement that defensive capabilities are not enough:

maintaining what is a capable, but largely defensive, force in the medium to long term will not best equip the ADF to deter attacks against Australia or its interests in the challenging environment this document sets out. (page 27)

Credible deterrence will require a different force structure—one that can impose greater cost at greater range:

The nature of current and future threats—including coercion in the region, more capable and active regional military forces, and expanding anti-access and area denial capabilities—requires Defence to develop a different set of capabilities. These must be able to hold potential adversaries’ forces and infrastructure at risk from a greater distance, and therefore influence their calculus of costs involved in threatening Australian interests. (page 27)

## A superior force or an asymmetric one?

The DSU and FSP refer in several places to the region's expanding anti-access and area-denial (A2/AD) capabilities. Of course, A2/AD is most commonly associated with China. Faced with the US's far superior conventional military capabilities, Beijing has sought capabilities, such as long-range anti-ship missiles, to defeat or at least deter them through asymmetric systems, rather than seeking to outmatch the US. But the systems needed to conduct A2/AD are proliferating throughout the region.

A2/AD is one of threats that the ADF's new capabilities are meant to counter, but, in the absence of detail on how the ADF plans to operate, it's not clear how it will counter them. The US military is grappling with the same problem. Does it seek to defeat China's A2/AD capabilities so that it can 'break in' to the areas China is seeking to keep it out of? Or does it accept that that's now too difficult and costly, so it will set up its own A2/AD barrier to stop China 'breaking out'? The US Marine Corps appears to be moving to the latter concept, the US Air Force, with its penetrating strike programs such as the B-21 stealth bomber, is still committed to the former, and the US Navy is caught in between, trying to work out how to make the massive sunk cost in its aircraft carriers relevant against a dense and lethal A2/AD network.

Elements of that dilemma are also visible in the DSU. Australia has traditionally sought to achieve technological superiority over potential adversaries in the region through our greater spending power and access to US military technologies. But China has moved beyond countering the US's force asymmetrically and is now developing its conventional power projection capabilities at a rate far faster than the US to potentially outmatch it. So achieving superiority over China isn't possible for us, as the FSP concedes (page 27):

Given Australia's limited resource base, we must improve our ability to deliver these effects without seeking to match the capability of major powers. This includes developing capabilities to hold adversary forces and infrastructure at risk further from Australia, such as longer-range strike weapons, cyber capabilities and area denial systems.

If you're not trying to match, you're certainly not trying to overmatch. In essence, we appear to have accepted that we're now in the position of having to employ asymmetric capabilities to counter the conventional superiority of a potential adversary. There are certainly capabilities in the FSP, both new and old, that fit that description, such as the long-range anti-ship missiles (actually a capability that's been in the force structure plan since 2012, despite the recent announcement that Defence is acquiring them) and 'smart sea mines'.

But there are many other very expensive capabilities in the FSP that don't fit the description of holding an adversary at risk further from Australia (such as LAND 400's IFVs ...). So, are we seeking asymmetric denial capabilities to deter China, but still seeking conventional superiority over everybody else in the region, from non-state actors up to states? Again, if we reverse-engineer the operating concepts from the shopping list, that appears to be the case.

## The long-range strike 'debate'

But acquiring asymmetric denial capabilities, such as longer range strike missiles, doesn't mean that the DSU is seeking to deter China by being able to strike it with conventional weapons, as some commentators (such as Hugh White<sup>6</sup> and Van Jackson<sup>7</sup>) have suggested.

This appears to be one of those cases in which those raised in the Australian version of the defence policy blob are prisoners of their own categories and intuitively equate a capability (long-range strike) with a concept (deterrence by punishment) and, in turn, with an action (bombard China). There's nothing that says long-range strike is only useful for deterrence by punishment by striking an opponent's homeland.<sup>8</sup>

White's interpretation of the DSU's statement that the ADF will hold an adversary's infrastructure at risk through long-range strike capabilities as a declaration that the Australian Government will attack China is not a reasonable one. The government and Defence leadership are just as aware as White that it would take far more conventional weapons to achieve any effect through deterrence by punishment than the ADF could ever launch and would expose Australia to retaliation. White's reading of the DSU's term 'infrastructure' as 'China itself' takes the term out of context; the full statement is 'hold potential adversaries' forces and infrastructure at risk from a greater distance'. That implies the adversary's power projection capabilities. The context is clearly one of deterrence by denial; that is, making it too difficult for the adversary to achieve their military goals.

It's possible that those forces and that military infrastructure could be in the adversary's homeland, but in the case of China the number of potential targets would be enormous, even assuming that Australia had weapons that could reach them. While it's within the realm of the very remotely conceivable that one might try to do something like destroying submarines at their wharves, it seems for more likely to me that the targets would be the adversary's forward bases closer to us.

One of the reasons the long-range strike discussion is so confused is due to different understandings of the terms 'long-range' and 'strike' and the associations that they raise. For some, 'long-range' seems to imply 'strategic', 'the opponent's homeland' and so on. Similarly, some associate 'strike' with 'strategic'. But such associations need to be rethought as the range of contemporary weapons and their targeting infrastructure grows. As technology evolves, the 'industry standard' for range is growing. The DSU and FSP recognise this: 'New weapons being introduced into the region have increased range, speed, precision and lethality, placing Australian military forces at greater risk over longer distances' (page 13). The industry standard is likely to grow considerably as hypersonic weapons mature.

If you're trying to defend yourself with weapons with a range of 100 kilometres against an adversary armed with weapons that have a range of thousands of kilometres, you're taking a very small knife to a gunfight. But acquiring better weapons doesn't mean that you're going to go to your opponent's house and kill his family. Ironically, if you want to focus on defending Australia in the way that White has advocated, long-range strike weapons are now absolutely essential to be able to do that.

Take for example, the Long Range Anti-Ship Missile (aka LRASM) that Australia is acquiring. It has 'long range' in comparison with the generation of anti-ship missiles that it's replacing, such as the Harpoon, but it's no more 'strategic' than the Harpoon is. The additional range is simply needed to counter contemporary Chinese and Russian anti-surface and anti-air capabilities that are available on the open market.

Similarly, if Defence acquires the LRASM's sister weapon, the extended range version of the Joint Air-to-Surface Standoff Missile, JASSM-ER, which is optimised for land targets, it's simply a step up in range from the original variant of the JASSM that the ADF already has. It doesn't suddenly give the ADF the ability (or inclination) to target China itself. It's to target forward operating bases in the region. That is, long-range weapons have tactical or operational applications. Even hypersonic missiles, which the FSP devotes significant funding to, won't suddenly change that.

## **1.5 Warning time**

### **We've used up our warning time**

One further example of much more straightforward language in the DSU is the statement that we won't get adequate warning time to develop the military capabilities we need. This is a far cry from the 2009 DWP, which asserted we would get 10 years of warning time:

Australia has an enduring strategic interest in ensuring that any attempt by nearby states to develop the capacity for sustained military operations against us would be detected with as much warning time as possible. This would preferably be at least a decade, given the amount of lead-time involved in building defence capabilities ... We can be confident of getting this amount of strategic warning time, in part because of our current level of military capability relative to our region. (page 27)

The 2013 DWP hedged a little, stating that ‘there is no guarantee of sufficient warning time being available to enable generation of an optimal military response in any given situation’ (page 44), but it also stated that ‘we would still expect substantial warning time of a major power attack, including dramatic deterioration in political relationships’ (page 30).

On this issue, the DSU is again very forthright:

Previous Defence planning has assumed a ten-year strategic warning time for a major conventional attack against Australia. This is no longer an appropriate basis for defence planning ... Growing regional military capabilities, and the speed at which they can be deployed, mean Australia can no longer rely on a timely warning ahead of conflict occurring. Reduced warning times mean defence plans can no longer assume Australia will have time to gradually adjust military capability and preparedness in response to emerging challenges. (page 14)

The wording is quite remarkable. Not only can we not rely on warning time for the occurrence of a major regional crisis or conflict, but we can’t rely on it for a major conventional attack on Australia. In retrospect, our 10-year warning probably started ticking in 2009.<sup>9</sup>

### **But what are we doing about it?**

However, in contrast to the clear statement that we can’t rely on warning time, the DSU doesn’t say what we’re going to do about it. Certainly, the issue of disappearing warning time is one element of Australia’s changing strategic environment that the DSU and the FSP address in general, but it’s not addressed specifically.

There are two broad ways to deal with a lack of warning time. The first is to seek to develop military capabilities as rapidly as possible; they might not be the ideal capabilities, but they’re better than what we have now. The other is to conduct business as usual and accept that, if a crisis occurs, you’ll meet it with whatever your business-as-usual processes happen to have delivered.

And it’s here that the DSU is perhaps weakest. The passage above says that we can’t *gradually* adjust. That implies that the government has chosen the first of the two possible responses, yet it’s hard to see evidence of that in the FSP. Key investments don’t deliver for a decade or more—those are the timeframes of business as usual in an era when we could rely on strategic warning time. This was always going to be the challenge facing the DSU and FSP when Defence’s biggest, but also slowest, projects weren’t on the table as a part of the reprioritisation process. We’ll see in later chapters that this is perhaps the area where this iteration of the FSP is least successful in responding to the key drivers in our strategic environment.

## **1.6 It’s still a very broad force**

As is the case with high-level defence planning documents such as white papers, the DSU has long lists of the kinds of things the government wants Defence to do, but very few explicit statements about what it doesn’t expect Defence to do. Acquiring nuclear weapons is about the only thing in the latter category.

At the high end of the capability spectrum, while the government doesn’t want Defence to ‘match’ major powers’ capabilities, it still wants it to have the ability to deter and defeat them. Consequently, the DSU envisages a force

with high-end conventional war-fighting capabilities as well as asymmetric capabilities. And Defence also has to develop greater self-reliance in sustaining those capabilities. Despite the primarily maritime and archipelagic operating environment, the government appears to want a force that can also engage in high-intensity land combat. The ADF also has to respond to, and itself adopt, emergent capabilities such as cyber, space and hypersonic weapons.

In the middle of the spectrum, the force also has to have capabilities that can better respond to adversaries' grey-zone operations. It has to have sufficient capacity to support increased engagement with regional partners. And, at the low end of the spectrum, Defence has to 'enhance its support to civil authorities in response to national and regional crises and natural disasters, such as pandemics, bushfires, floods or cyclones' (page 29).

Defence still has to operate across an immediate region that's enormous. And, while the government doesn't want Defence to design its force for operations outside the immediate region, it still reserves the right to deploy the ADF outside the region if it assesses that that's in the national interest.

It's all a big ask. Those requirements will pull Defence's force structure wider and wider. Certainly, as we shall see, the government is providing Defence with significant funding to grow its capabilities over time, but breadth comes at the expense of depth.

To recap: the kind of force that the DSU envisages to support its restatement of our strategic settings should have the following characteristics. It should:

- be designed primarily to operate in our immediate region
- be able to shape our security environment, deter adversaries and, if necessary, respond to aggression
- have offensive capabilities that can impose cost and risk at greater distance
- be able to operate across the spectrum of operations from disaster response through grey-zone operations to high-end war fighting
- provide more military capability rapidly.

In subsequent chapters, we'll look at whether the DSU's funding model and planned force structure will deliver that.



## Chapter 2: The funding model

### Key points

- Despite the fiscal and economic uncertainty created by the Covid-19 pandemic, the government has confirmed its commitment to the 2016 DWP funding line and extended it for a further four years.
- Like the funding line in the 2016 DWP, the funding line in the DSU is not linked to any percentage of GDP.
- Under this model, the defence budget will grow in nominal terms by 7.2%, 9.2%, 9.0% and 6.3% over the next four years and in the longer term it will grow at around 5.4%. This is likely to result in sustained real growth.
- The main area for growth continues to be the capital program, which grows to and then stays at 40% of the total defence budget.
- The cost of defence will also increase due to the rapidly increasing cost of acquiring and sustaining modern military equipment, as well as the number of new capabilities in the FSP.

The funding line presented in the DSU is a major win for Defence in a time of difficult economic circumstances because it reaffirms the 2016 DWP funding model and extends it for a further four years. This line provides Defence with substantial real funding growth over the next decade.

In this chapter, I use the term ‘White Paper decade’ to refer to the 10-year funding line presented in the 2016 DWP, extended out to 2025–26, and ‘DSU decade’ to refer to the 10-year funding model presented in the DSU, which extends the model to 2029–30.<sup>10</sup>

### 2.1 The 2016 Defence White Paper funding line

#### Has it been delivered?

Despite the public and media focus on the government’s 2016 DWP commitment to increase the defence budget to 2% of GDP by 2020–21, the paper in fact decoupled defence funding from GDP. It provided a 10-year funding line that wouldn’t change, regardless of fluctuations in GDP, stating that this was intended to provide a stable basis for Defence’s planning. Granted, the government also committed to hitting 2% of GDP in 2020–21, but it didn’t peg the budget mechanically at that level beyond then.

Promises are one thing, delivery is another, and there have been many examples of government not living up to funding commitments, but, in four budgets since the 2016 DWP, the government has delivered the funding it promised. Once we take into account adjustments such as supplementation for operations, no win / no loss compensation for foreign exchange rates, and some relatively minor reprofiling (that is, moving money forward or backward between years), Defence has received almost exactly what the government promised.<sup>11</sup> Even when we take into account the funding that Defence has had to give up (for example, as an efficiency dividend, or as a contribution to a new cybersecurity measure) or new activities that it’s been directed to do without any additional funding (such as the Pacific Step-up), they’re relatively minor costs and don’t change the big picture.<sup>12</sup> Overall, the funding provided is within 0.2% of the 2016 DWP commitment (Table 2.1).

Table 2.1: Actual defence funding compared to 2016 DWP commitment (\$ million)

	2016–17	2017–18	2018–19	2019–20	Total
WP 2016 funding line	32,374	34,199	36,769	39,086	142,428
WP 2016 funding line, including adjustments	31,929	35,104	37,503	39,311	143,847
Actual defence funding	31,999	34,926	37,239	39,329	143,493
Difference	70	-178	-264	18	-354
Actual funding as % of adjusted 2016 DWP funding line	100.2%	99.5%	99.3%	100.0%	99.8%

Sources: Based on Department of Defence data (PBS, PAES, 2016 DWP).

That funding has delivered substantial growth. From the 2015–16 Budget, which preceded the DWP, to 2019–20, nominal growth has been 26.3%, which equates to a very healthy 17.5% in real terms (Table 2.2). Overall, the four years since the DWP have presented a remarkable picture of reliable and growing funding.

Table 2.2: Annual growth in defence spending since the 2016 DWP (\$ million)

	2015–16	2016–17	2017–18	2018–19	2019–20
Nominal defence spending	31,151	31,999	34,926	37,239	39,329
Nominal annual growth (\$m)	1,127	848	2,927	2,313	2,090
Nominal annual growth (%)	3.8%	2.7%	9.1%	6.6%	5.6%
Real spending (2019–20 basis)	33,458	33,792	36,185	37,955	39,329
Real annual growth (\$m)	766	333	2,393	1,771	1,374
Real annual growth (%)	2.3%	1.0%	7.1%	4.9%	3.6%
% of GDP	1.88%	1.81%	1.89%	1.91%	1.98%

Sources: Based on Department of Defence data (PBS, PAES); Department of Treasury, Budget paper no. 1.

## The growing gulf between the 2016 Defence White Paper model and 2% of GDP

The government also made a commitment that the defence budget would reach 2% of GDP by 2020–21. It was on track to do that. The 2019–20 PBS predicted 1.93% for that year, which was revised up to 1.96% in the PAES in January. Even before the Covid-19 crisis, GDP hadn't grown as strongly as the defence funding model since the 2016 DWP. Consequently, Defence's funding line was on track to grow well past 2% of GDP in the second half of the White Paper decade. By how much depends on your predictions of GDP growth. Governments don't like to make long-term predictions of GDP growth, but if we project out the short-term growth rate presented in the 2019–20 Budget papers to 2025–26, we can see that 2% of GDP falls well short of the 2016 DWP's funding line (Table 2.3). In fact, funding would grow to beyond 2.2% of GDP. By the back end of the White Paper decade, the difference is in the order of \$5 billion per year.

Table 2.3: Difference between the 2016 DWP funding line and 2% of GDP—the pre-Covid-19 picture (\$ billion)

	2020–21	2021–22	2022–23	2023–24	2024–25	2025–26	Total
2016 DWP funding line	41.8	45.6	49.7	52.9	55.7	58.7	262.6
2% of GDP based on 2019–20 Budget papers' projections	41.6	43.5	45.4	47.8	50.4	53.1	240.2
Shortfall	-0.2	-2.1	-4.3	-5.0	-5.4	-5.7	-22.4

Sources: Department of Defence data (PBS, 2016 DWP); Department of Treasury, Budget paper no. 1.

Defence's planning is based on spending every dollar that the government says it will give it. So, hypothetically, if the government did link the budget mechanically to 2% of GDP, it would result in a huge cut to Defence's budget, and consequently to its capability. To put that in perspective, \$5 billion is roughly equivalent to the annual sustainment cost of Defence's 30 most expensive current capabilities, or more than the annual cost of the government's domestic shipbuilding program when it's up and running. In short, even before we take Covid-19 into account, any deviation from the 2016 DWP funding line was going to hurt.

### The Covid-19 crisis

But since the 2019–20 mid-year budget update we have of course experienced the Covid-19 crisis—which is by no means over. In its 2019–20 Budget, the government was confident of crossing the finish line in its six-year quest to achieve a surplus, and that confidence was boosted in its December 2019 Mid-Year Economic and Fiscal Outlook. However, from the outset of the pandemic, it was clear that the outbreak would have a major impact on the government's revenue and expenses. As it ramped up stimulus measures to mitigate the impact on the broader economy while its revenue predictions fell, the government's Budget picture began heading in the wrong direction by \$20–30 billion per month. Predictions for GDP also plummeted, and it became clear that Australia was in recession for the first time since 1991. Despite the increasingly gloomy picture, ministers reaffirmed the government's commitment to the 2016 DWP funding line regardless of what happened to GDP. Nevertheless, when the government delayed the release of its 2020–21 Budget due to the economic uncertainty, questions were raised about the future of the defence budget.

Nobody knows how badly the economic picture is going to get, but we can see the government's thinking about the likely extent of the damage in the Economic and Fiscal Update that it put out on 23 July. It confirmed the relatively dire predictions. The forecast surpluses of \$7.1 billion in 2019–20 and \$11 billion in 2020–21 had become deficits of \$85.8 billion and \$184.5 billion. Six years of progress had been undone in a few months (Table 2.4). Real GDP growth was revised downwards to -0.25% in 2019–20 and -2.5% in 2020–21.

Table 2.4: Forecast versus actual underlying cash surplus/deficit, 2013–14 to 2020–21 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
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							-85.8	-184.5			
	% GDP							-4.3	-9.7			

Budget year estimate	Forward estimates	Actual achievement
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Source: Department of Treasury, Budget paper no. 1.

Australia's situation was certainly not as bad as that of many countries, but if the government wanted to temper its defence funding commitment, the pressure on the Budget caused by the virus certainly gave it grounds to do so. It could have, for example, said it was sticking exactly to 2% GDP rather than the 2016 DWP funding line. Based on the GDP predictions in the July economic and fiscal update, that would be around \$37.9 billion in 2020–21, or a shortfall of \$4.3 billion compared to the DWP line, or around 10% of the defence budget. The loss of that much funding would definitely have a major impact on capability. Alternatively, it could have limited its funding commitment only to the forward estimates (that is, to 2023–24), or not extended its commitment beyond the DWP's final year of 2025–26. But it didn't.

## 2.2 The 2020 Defence Strategic Update's funding model

### How much is it?

The DSU puts speculation about the immediate future of the defence budget to rest. The government's assessment of Australia's strategic circumstances and the strategy and capability required to address those circumstances, which I've discussed in Chapter 1, weren't mere words. It's backed its strategy up with money.

There are three major pieces of good news for Defence. First, despite the hit to the government's budget position and the broader economic pain, it reaffirms the government's commitment to a fixed funding line that isn't linked to any particular percentage of GDP. Second, it reaffirms that the fixed funding line over the next six years remains the same as the one provided in the 2016 DWP. Third, it extends that funding line for a further four years. In short, out to 2025–26, the new line is virtually identical to the old one. Beyond that point, the new line extends the growth trajectory of the old one out to 2029–30 (Table 2.5).<sup>13</sup>

Table 2.5: 2016 DWP funding line versus 2020 DSU funding line (\$ million)

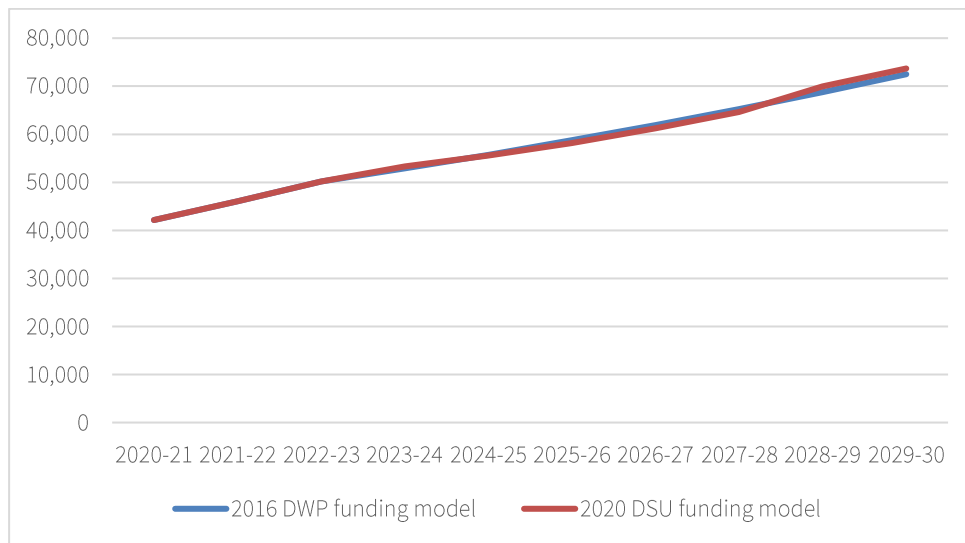
	2020–21	2021–22	2022–23	2023–24	2024–25	2025–26	2026–27	2027–28	2028–29	2029–30	Total
2016 White Paper / 2019–20 Budget	42,151	46,037	50,182	52,877	55,733	58,742	61,914	65,257	68,781	72,496	574,170
Nominal growth rate	7.2%	9.2%	9.0%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	5.4%	
2020 Defence Strategic Update	42,151	46,037	50,170	53,318	55,567	58,175	61,239	64,639	69,986	73,687	574,969
Nominal growth rate	7.2%	9.2%	9.0%	6.3%	4.2%	4.7%	5.3%	5.6%	8.3%	5.3%	
Difference (positive means 2020 DSU is greater)	0	0	-12	441	-166	-567	-675	-618	1,205	1,191	799

Note: Italicised figures are hypothetical projections of the 2016 DWP funding model.

Sources: Department of Defence data (PBS, 2016 DWP, 2020 DSU).

The overall difference between the old and new models is minuscule—around 0.14% in favour of the new model over the decade. Represented graphically (Figure 2.1), the two lines overlies each other.

Figure 2.1: 2016 DWP funding model v. 2020 DSU funding model (\$ million)



Sources: Department of Defence data (PBS, 2016 DWP, 2020 DSU).

In short, despite the massive—and growing—budget deficit and the hit to GDP, there’s been no reduction to the defence budget. It’s a huge win for Defence. Not only has it avoided the prospect of cutting capabilities in its investment plan, but it’s planning to acquire a raft of new ones.

### New money versus old

If it’s essentially the same funding line as before, does that mean there’s no ‘new money’? Well, yes and no. Certainly out to 2025–26 there’s no new funding, and beyond that it grows on the same trajectory. It’s not a return to the 3% of GDP that Australia was spending during the Cold War, which some, including some ASPI

analysts, have been advocating. In the current economic climate, it's hard to see any government going that far just yet, despite growing strategic uncertainty.

Nevertheless, the planned funding line grows at a robust rate (Table 2.5). For example, the DSU confirms that the defence budget will grow in nominal terms by 7.2%, 9.2%, 9.0% and 6.3% over the next four years. Out at the back end of the decade, the planned growth continues at a more restrained but still healthy rate of around 5.3% per annum. While it would take a very brave person to predict the rate of inflation over the decade, it's a reasonably safe bet to say that the DSU funding line also represents solid, sustained growth in real terms over the decade that will comfortably outstrip inflation.

### The longer term viability of the DSU funding model

The government is to be commended for backing up its stated commitment to Australia's security and sovereignty with funding in the DSU. But the longer-term economic impact of Covid-19 is extremely uncertain. The July Economic and Fiscal Update is arguably based on some optimistic assumptions, such as how quickly Australia and the world might recover from the pandemic, how long the government will need to keep providing economic stimulus and income support, and so on, but nobody really knows what the recovery will look like. At the time of writing, Victoria is in the middle of a full-blown second wave that's worse than the first, and large parts of the US appear to have entirely lost control of the spread of the virus. Real GDP in the US fell at an annualised rate of 32.9% in the second quarter of 2020.<sup>14</sup> Many countries have yet to 'flatten the curve', and many of those that have done so successfully are now suffering renewed outbreaks. Australia and the world aren't out of the woods by any means.

We can model many different recovery scenarios but, in all of them, the DSU funding line grows well beyond 2% of GDP very quickly. Table 2.6 presents an optimistic scenario, taking the government's GDP estimates for 2019–20 and 2020–21 and projecting a return to 'normal' conditions and GDP growth by 2022–23. Even under that scenario, the DSU funding line grows to 2.5% of GDP, and the difference between the DSU funding line and 2% of GDP quickly reaches \$10 billion per year (see Table 2.6 and Figure A.1 in 'The DSU in eight tables'). Under more pessimistic scenarios, such as extended stagnation, that difference can easily get much bigger.

Table 2.6: Difference between the DSU funding line and 2% of a 'quick recovery' GDP (\$ billion)

	2020–21	2021–22	2022–23	2023–24	2024–25	2025–26	Total
DSU funding line	42.2	46.0	50.2	53.3	55.6	58.2	305.4
DSU as % of GDP	2.2%	2.4%	2.4%	2.5%	2.4%	2.4%	
Defence budget based on 2% of GDP	37.9	39.0	41.1	43.3	45.6	48.0	254.9
Shortfall	-4.3	-7.0	-9.1	-10.0	-10.0	-10.2	-50.5

Note: Apparent errors in additions are due to rounding.

Sources: Department of Defence data; Mid-Year Economic and Fiscal Update, July 2020; ASPI modelling.

This diverging relationship matters because Defence's FSP relies on every dollar in the DSU being delivered. This government, and future governments, will need to maintain its resolve and resist any temptation to move away from the DSU's fixed funding line. Adopting an arbitrary number such as 2% would deliver a budget cut that would inevitably result in the loss of core capabilities.

That could be increasingly difficult if economic circumstances remain difficult, but prolonged global economic uncertainty is likely to also mean increased strategic uncertainty. At the moment, one could suggest that the government's position is 'in for a penny, in for a pound'—with the deficit so large, trimming defence funding

makes little difference to the overall Budget picture. Moreover, domestic defence spending can be regarded as a form of stimulus. However, in previous recessions and economic shocks, the big cuts to the defence budget have not come immediately, but several years later as governments sought to get the Budget back into surplus. For example, the last time the defence budget suffered a substantial cut was not when the Labor government was dealing with the initial impact of the global financial crisis, but several years later, when it was trying (ultimately unsuccessfully) to meet a commitment to return the Budget to surplus. At that time, however, our strategic circumstances weren't as trying as they are now.

Overall, delivering the DSU funding line is going to take sustained commitment through some very trying economic times.

## 2.3 Top-level numbers

### \$575 billion—total defence funding over the decade

The total defence budget over the decade from 2020–21 to 2029–30 is \$574,969 million. The 10-year funding profile is provided on page 54 of the DSU.

The corresponding number in the 2016 DWP for 2016–17 to 2025–26 was \$447,646 million. In the first four budgets following the 2016 DWP, the government has delivered that funding (\$143.5 billion).

### \$270 billion—‘capability investment’ over the decade

The DSU says that over the decade to 2029–30 the government will spend \$270 billion on what it terms ‘capability investment’. If you add up the top-level numbers for the six domains in the FSP, they do in fact total \$270 billion (see Table 3.2). The corresponding number presented in the 2016 DWP for the 10 years out to 2025–26 was the \$200 billion that was cited frequently by the government and repeated in the media.<sup>15</sup>

It wasn't quite clear in the 2016 DWP what that \$200 billion included. The FSP is clearer. ‘Capability investment’ isn't the same thing as Defence's capital acquisition budget. The FSP defines capability investment by saying that ‘these figures comprise acquisition and future sustainment funding of Defence capabilities’ (page 21), but ‘future sustainment’ isn't the same thing as what Defence will be spending on sustainment in the future. In Defence terminology, ‘future sustainment’ is the difference between what it costs to sustain an existing capability and what it will cost to sustain its replacement. If it costs \$100 million a year to operate a current aircraft fleet and the estimate for its future replacement is \$130 million, then the future sustainment is \$30 million.

So the \$270 billion covers what Defence is spending on acquisition, plus the cost of sustaining those new systems beyond what it currently costs to sustain the systems that they're replacing.

Neither the DSU nor its supporting factsheets break the \$270 billion down into an annual spend for each year of the decade or between the acquisition or future sustainment buckets. However, from the information that's there, it's possible to roughly reverse-engineer the decade's total acquisition budget at around \$220 billion.<sup>16</sup> Therefore, the future sustainment component will be around \$50 billion. We can also do some reverse-engineering to estimate the total sustainment budget over the decade at around \$180 billion. Therefore, around 28% of the sustainment budget will be devoted to the additional cost of supporting new equipment. Noting the rapidly growing sustainment cost of military equipment, there's some risk that that mightn't be enough, as I discuss below.

## 2.2%—Defence budget as a percentage of GDP in 2020–21

The defence budget as a percentage of GDP in 2020–21 is 2.2%, according to the government’s GDP figures published in its July 2020 Economic and Fiscal Update. As discussed above, that percentage is very likely to grow over the decade.

Due to the decline in GDP as a result of Covid-19, the defence budget reached 1.98% of GDP in 2019–20, exceeding the 1.93% predicted at the time of the Budget in May 2019 and the 1.96% we revised that to after the government’s mid-year budget update.

## 87.4%—nominal growth over the decade

Defence funding in 2019–20 was \$39,329 million. Under the DSU funding model, that will grow over the decade to \$73,687 million. In nominal terms, that’s growth of 87.4%. Any estimate of real growth depends of course on what rate of annual inflation we’ll experience, but, if we assume 2.5% inflation over the decade (a slightly higher rate than over the past decade), it will be real growth of 47%. In comparison, real growth over the decade to 2019–20 was around 26%. This shows how the DSU funding line is a major commitment by the government against the background of the economic impact of Covid-19.

So, unless we return to sustained rates of inflation that we haven’t seen for a couple of decades, the planned defence budget should comfortably outstrip inflation. However, it’s wise to bear in mind that the cost of specialist military equipment generally grows at a faster rate than the broader economy, sometimes much faster, so the defence budget needs to grow faster than inflation just to maintain purchasing power.

## 2.4 Where does the money go? The big 3

It’s useful to consider the defence budget as three large pots of money:

- capital (which can also be termed ‘acquisition’ or ‘investment’)
- personnel
- operating (which mainly consists of sustainment, but also includes the cost of ADF operations ranging from Afghanistan to the recent Operation Bushfire Assist).

### Capital spending

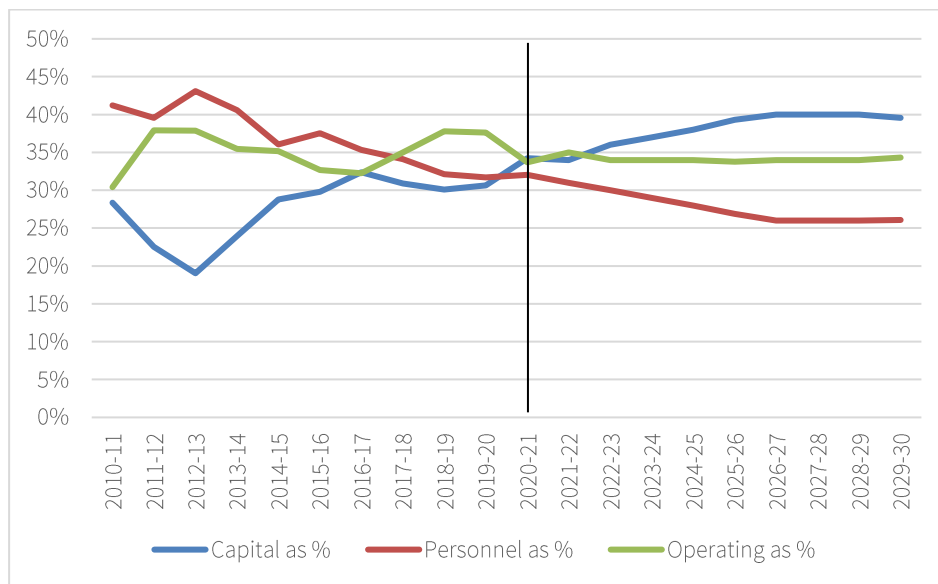
The DWP funding model funnelled much of its increased funding into Defence’s capital acquisition budget. Over the White Paper decade, the capital budget was meant to grow from 29% of the total budget (after having already recovered from a low point in 2012–13 of 19%) to over 39% by 2025–26. As the capital budget’s share grew, personnel’s relative share would fall, from 37% to 26%. Meanwhile, the third element of the big three—operating costs (consisting primarily of sustainment costs)—would stay relatively stable at between 33% and 35% of the total.

It’s too early to say whether things will go according to plan. So far, capital’s share of the budget has hit around 30% and remained there for several years. Personnel’s share has fallen, but operating costs’ share has risen.

Overall, the new model reproduces the old one and essentially freezes the balance at the point it reaches in 2025–26: capital reaches 39–40% of the total and stays there out to 2029–30, sustainment stays at around 34%, and personnel falls to 26% and stays there (Figure 2.2).



Figure 2.2. The balance between the Big 3



Source: Department of Defence data.

I’ve previously discussed whether this is viable in the longer term. While it may be possible to invest heavily in the short to medium term to acquire systems, in the longer term funding is required to sustain those systems and have the people to operate them. A 40%/26% capital/personnel split is the inverse of the longer term historical split. It’s interesting to note that the capital budget has hovered fairly stubbornly at around 30% of the total over the past five years.

It could be that there’s a natural limit to capital spending at around 30% of the budget that’s hard to break through. On the other hand, it’s possible that Defence could hit the planned capital spend once megaprojects such as shipbuilding and armoured vehicle projects ramp up production. But, once those systems are eventually delivered, they come with very large sustainment bills, which will push up sustainment spending.

### Personnel numbers and spending

The FSP acknowledges that there’s unfinished business in Defence’s personnel planning. The 2016 DWP created 2,500 ADF positions and 800 public service positions, to be created and filled over the decade to 2025–26.<sup>17</sup> The FSP foreshadows further growth, stating that:

based on detailed analysis of a range of military scenarios, from humanitarian assistance and disaster relief operations to combat, the Government has identified a need to grow the ADF and the APS beyond the size approved under the 2016 Defence White Paper . . . A detailed proposal for this longer-term growth will be considered by Government in 2021.

The FSP doesn’t state how many more people are needed, but the numbers could be substantial. For example, the Navy will probably need to triple the number of its submariners to operate the full fleet of 12 future submarines, and its internal analysis suggests that it may need to grow from 15,000 to around 20,000 personnel.

The FSP does state that ‘as an initial step, Government has committed to grow the ADF by around 800 and the Australian Public Service (APS) by approximately 250 personnel in the short term.’ Defence has confirmed to ASPI that those positions are in addition to the growth set out in the 2016 DWP. Defence has also confirmed that the longer term growth (that is, not just the initial 800 ADF and 250 APS positions) that the government will consider

in 2021 is funded in the DSU model. Therefore, even though personnel’s share of the budget falls to 26%, it’s Defence’s view that it’s included enough funding to cover the necessary growth in numbers.<sup>18</sup>

In the DSU funding model, workforce spending does increase by 42% in nominal terms over the decade.<sup>19</sup> That’s pretty substantial, but will it be enough? There are two aspects to addressing that question that we can’t answer at this point: how many people will be in the plan to be considered by the government in 2021, and whether that number of people is sufficient to operate the future force.

## 2.5 Where does the money go? Breakdown by state or territory

The government issued media releases along with the DSU that provided a breakdown of defence spending by state. Those media releases provided figures for:

- the estimated investment in each state over the coming decade in facilities
- the total spend in each state for the 12 months to March 2020
- the total number of defence personnel, including reservists and public servants, in each state.

At the risk of unleashing a round of interstate grudge matches, we’ve aggregated those numbers in Table 2.7.

Table 2.7: Defence spending, by state or territory

	Investment over coming decade in facilities (\$b)	%	Investment to 12 months to March 2020 (\$b)	%	Defence personnel (current)	%
New South Wales	10.0	32.3%	5.3	25.0%	30,300	26.4%
South Australia	2.6	8.4%	3.4	16.0%	9,000	7.9%
Western Australia	2.5	8.1%	1.4	6.6%	7,800	6.8%
Tasmania	0.0	0.0%	0.0	0.0%	1,000	0.9%
Northern Territory	8.0	25.8%	0.5	2.4%	6,000	5.2%
Victoria	3.6	11.6%	3.6	17.0%	15,000	13.1%
Queensland	3.0	9.7%	3.0	14.2%	28,000	24.4%
ACT	1.3	4.2%	4.0	18.9%	17,500	15.3%
<b>Total</b>	<b>31.0</b>	<b>100.0%</b>	<b>21.2</b>	<b>100.0%</b>	<b>114,600</b>	<b>100.0%</b>

Source: Defence ministers’ media releases, 1 July 2020.

It’s interesting to see some significantly different percentages across the three columns. NSW ranks at the top in all three. The Northern Territory will be the site of the second largest amount of facilities work, even though it has only 5.2% of defence personnel and ranks second last in terms of spending over the previous year. Queensland is home to one-quarter of Defence’s people, but it’s getting only one-tenth of future facilities investment.

The personnel percentages are broadly consistent with data previously published by ASPI derived from Defence’s annual report. With no major base or unit relocations planned, those broad percentages are unlikely

to change much in the coming decade unless the personnel increases flagged for government consideration next year include some significant surprises.

The media releases state that 'investment over the previous 12 months' includes acquisition and sustainment spending, so the split is quite different from the personnel numbers. However, since total defence spending over the previous 12 months was around \$38 billion and the table totals only \$21.2 billion, it's not quite clear where the other \$17 billion has gone. Defence's overseas acquisition and sustainment spend is around \$8 billion, so there's about \$9 billion unaccounted for.

I look at the breakdown between local and overseas spending in Chapter 5 on defence industry.

## 2.6 Is \$575 billion enough?

There are two ways to frame this question.

- Is the DSU's funding line sufficient to deliver the military capabilities needed to preserve Australia's sovereignty and protect our people and interests in an age of increasing strategic uncertainty? That's more a question about whether the force outlined in the FSP is the right one and is being delivered at the right time.
- Is the DSU's funding line sufficient to deliver and sustain the military capabilities described in the FSP? This is a difficult question to answer directly, particularly without access to Defence's cost analysis.

The rest of this brief is essentially an extended exploration of those questions.

### It's as much art as science

It's the job of the Secretary of the Department of Defence and the Chief of the Defence Force to assure the government that the funding it's providing is sufficient to deliver and sustain the military capability it requires from Defence. There's no suggestion that they're remiss in that duty. They're supported by very capable people, many of whom I have worked with and respect. They, in turn, are supported by specialist skills in industry, such as analysis and cost estimation. It's important to acknowledge that work and commitment.

But force design is as much art as science, as is developing the costs for that force. The further into the future one projects, the more uncertainties there are. Force design and cost estimation both operate in assumption-rich environments, and those assumptions change. In a rapidly changing strategic and technological environment, they could change rapidly, resulting in adjustments both to the design of the future force and to estimates of what it costs.

There are some very substantial increases in the cost of defence in the FSP. In one sense, that's the result of Defence improving the quality, comprehensiveness and robustness of its cost estimates, but it's also an indication of the uncertainty inherent in estimating the cost of things that don't exist yet, to do tasks that aren't yet defined in an environment we haven't yet entered. That's the nature of this beast. Table 2.8 shows the scale of some of those changes.

Table 2.8: Cost increases from 2016 to 2020 (\$ billion)

Capability	2016 Integrated Investment Program cost	2020 FSP cost
Future submarines	>\$50.0	\$89.7
Replenishment / logistics support ship(s)	\$1.0–2.0	\$4.0–6.0
Future frigates	>\$30.0	\$45.6
Infantry fighting vehicles	\$10.0–15.0	\$18.1–27.1
Medium-range ground-based air defence	\$1.0–2.0	\$4.9–7.3

Sources: 2016 Integrated Investment Program (IIP) and 2020 FSP.

We already know that Defence has had to delay projects to free up funding for higher priorities, such as the ramp-up of the Future Submarine Program. As we've seen with every previous DWP and strategic update, no matter how rigorously planned and costed, no plan survives its first contact with reality. The FSP will be no different.

### The magic pudding

Despite the uncertainties, there are some things we do know. There first is that, while the funding envelope hasn't changed, there are a lot more capabilities being put into it. The front end of the decade is always full. In fact, it's more than full, since Defence 'over programs'; that is, it schedules more projects than it can afford on the very reasonable assumption that some projects will encounter unplanned delays. Further out into the decade, there tends to be some unassigned cash sitting around, and in the next decade (in this case, 2030–31 to 2039–40) there's a lot more.

To insert new capabilities in the near term, Defence would have to delay planned capabilities. There's not a lot of evidence that Defence has done much of that (and the government had directed that the megaprojects weren't in the trade space to start with, so they aren't moving to make room).

Defence isn't retiring any existing capabilities to free up funding for new things.<sup>20</sup> The things that have been removed don't exist yet. The FSP (page 96) states:

The overall impact on Australian industry of removing or delaying projects will not have an immediate impact, as most of these prioritisation decisions relate to investments that had not been approved and were not due to start for many years.

And those things, on the whole, are relatively small (such as upgrades to Defence's G-Wagen fleet).

However, there's a lot of new stuff (which I look at in Chapter 4). Some capabilities are completely new and extremely expensive, such as ballistic missile defence. Others are replacements for existing systems, but they're significantly expanded in size and capability and consequently cost. That's why, as I show in later chapters, virtually all of the significant new stuff is late in the decade or is in the second decade. Overall, Defence will continue to get broader and more complex.

Will the growth of Defence's budget be sufficient over the longer term to cover that growth? We don't know what rate of funding growth Defence is assuming will occur in the second decade of the FSP. It's reasonable to assume that it's around the 5.4% per annum that the government is giving it for the back end of the first decade. Defence

is betting that that will be enough cover the increasing cost of acquiring military systems and the growing complexity of the force.

**Unsustainable sustainment?**

One other thing we can be sure about is that the cost of sustaining military systems is increasing, and in many cases increasing rapidly. A very rough estimate of the increase in the sustainment cost of key capabilities is set out in Table 2.9, normalised to 2019–20 real dollars for an apples-to-apples comparison.<sup>21</sup>

Table 2.9: Comparison of the annual sustainment cost of legacy and future systems (2019–20 real dollars)

Capability	Legacy system cost	Future system cost
Submarines	\$615 million	\$2 billion
Frigates	\$361 million	\$700–750 million
Air combat	\$335 million	\$800–900 million
Armoured vehicles	\$60 million	\$700 million

Sources: Defence annual reports; information provided by Defence; ASPI analysis.

Defence’s budget has to increase at a rate that not only outruns the increasing acquisition cost of military systems, but also some very large sustainment cost increases associated with moving from one generation of military equipment to the next. The real cost of sustaining Defence’s submarine capability could triple as we move from the Collins class to the Attack class; the cost of its frigates is likely to double; its air combat costs could triple; and its armoured vehicle fleet could grow 10-fold. While this issue is most obvious at the level of the megaprojects, it permeates the entire force structure.<sup>22</sup>

There’s a lot at stake in the race between the growth of the defence budget and the growing cost of systems that Defence is aiming to acquire and operate. I’m not sure which horse I’d back in that race.

To recap, despite the uncertainties generated by the Covid-19 pandemic, the DSU confirms the government’s commitment to a steadily growing funding line for Defence. Over the longer term, Defence aims to use that funding to deliver and operate a significantly enhanced force. It’s likely that the funding stream and Defence’s estimate of the cost of the future force are closely aligned, so, if the government revises its funding line downwards, or Defence revises the cost of the force upwards, or indeed new requirements are identified, something has to give. That, again, is the nature of this beast.

## Chapter 3: The force structure

### Key points

- In the DSU, there's \$270 billion in planned capability investment (acquisition and future sustainment) across Defence's six domains in the decade out to 2029–30.
- The information in the FSP is high level and short on detail. It's broadly equivalent to that in the previous 2016 Integrated Investment Program and falls well short of what Defence could and should make publicly available.
- In many ways, the force is the same kind of force Australia has had for generations—built around highly capable and highly expensive manned platforms.
- However, there are signs that that's changing. There's around \$100 billion for guided weapons, including new kinds, such as longer range strike weapons. There's substantial planned investment in unmanned and autonomous systems, but it comes later in the first decade or even in the second decade.
- Despite the DSU's assessment that we can't rely on 10 years warning time, the delivery of key platforms is still some way off. It looks like Defence is relying on new weapons launched from its existing platforms to provide the main boost to capability in the short to medium term.

In this chapter, I look at how the future force is presented in the 2020 FSP and then make some observations about the nature of the force.

### 3.1 The six domains

#### The domains and their capability programs

The public Integrated Investment Program (IIP) supporting the 2016 DWP took a different approach from the Defence Capability Plan that it replaced. Rather than structuring capabilities along individual project lines, Defence took a more elevated approach that was structured on six capability streams. Some elements of its taxonomy were somewhat forced.<sup>23</sup> Nevertheless, it was an attempt to provide readers with a broad overview of the government's capability plans as coherent programs rather than as a mass of discrete projects.

The 2020 FSP broadly maintains that approach but with some meaningful tweaks. Overall, it's structured a little more intuitively. The six capability streams have become six domains. The FSP terms five of them 'operational' domains: Information and Cyber; Maritime; Air; Space; and Land. They're supported by a sixth domain: Defence Enterprise. The six domains are further broken down into 35 'capability programs' (Table 3.1). The capability stream of air and sea lift is gone. Space now has its own domain, consisting of two capability programs.

We'll replicate the FSP's colour coding for its domains.

Table 3.1: The Force Structure Plan’s six domains and 35 capability programs

Domains	Capability programs
Information and Cyber	Joint cyber
	Joint electronic warfare
	Strategic intelligence and cyber
	Joint intelligence, surveillance and reconnaissance
	Joint command, control, communications, computers
Maritime	Surface and above water combat
	Undersea combat and surveillance
	Mine warfare, patrol and geospatial
	Maritime command, control and communications, computers, cyber, intelligence, surveillance, reconnaissance and electronic warfare
	Combat support and amphibious
Air	Air combat
	Air mobility
	Maritime patrol and response
	Air intelligence, surveillance, reconnaissance and electronic warfare
	Combat air support
	Integrated air and missile defence
Space	Space service
	Space control
Land	Land intelligence, surveillance, reconnaissance and electronic warfare
	Land command, control, communications and computers
	Battlefield aviation
	Land combat mobility
	Land combat support
	Land combat vehicles
	Special operations

Domains	Capability programs
	Dismounted systems
Defence Enterprise	Geospatial information and intelligence
	Guided weapons and explosive ordnance
	Joint logistics
	Training areas and simulation
	Defence business enterprise architecture and transformation
	Enterprise information and communications technology
	Asymmetric and advanced warfighting
	Estate and infrastructure
	Innovation, science and technology

Source: 2020 FSP.

### Capability investment, by domain

As discussed in Chapter 2, the DSU states that the government will invest \$270 billion in capability over the coming decade. This is a combination of acquisition and future sustainment costs. The DSU provides a breakdown of investments by domain. They do, in fact, add up to \$270 billion. Other than a partial breakdown of the Defence Enterprise domain, the FSP doesn't provide a breakdown of investment funding by capability program. Funding by domain over the decade is listed in Table 3.2 (and represented in a pie chart on page 20 of the FSP and in Figure A.4 in 'The DSU in eight tables').



Table 3.2: Capability investment, by domain

Domain	Program	Capability investment (\$ billion)	%
Information and Cyber		15	6%
Maritime		75	28%
Air		65	24%
Space		7	3%
Land		55	20%
Defence Enterprise			
	<i>Defence Enterprise Programs</i>	15	6%
	<i>Innovation System</i>	3	1%
	<i>ICT</i>	5	2%
	<i>Defence Estate</i>	30	11%
Defence Enterprise subtotal		53	20%
Total		270	100%

Source: 2020 FSP.

### Investments within each domain

The FSP provides text describing the contents of the capability programs. It also provides a chart of ‘investments’ in each domain with a broad schedule and funding attached to each. The funding is in most cases in a band, although in a few cases it’s a point estimate. The FSP doesn’t directly assign individual investments in the charts to the capability programs described in the text.

It’s important to note that the funding attached to each domain and the funding attached to each investment within the domains are not calculated the same way. Therefore, if you add up the investments you get a very different result from the \$270 billion for the domains. According to the funding definitions on page 21 of the FSP, the funding for each domain is only for the first decade (that is, to 2029–30) and includes both acquisition and future sustainment funding. However, the cost estimates in the charts of the individual investments go out two decades to 2039–40 (with a number of exceptions that go beyond 2039–40), but they include only acquisition funding (again, with a small number of exceptions that include sustainment).

Therefore, if we tally up the investments in each domain, we get a different number from the capability investment figures above (Table 3.3).

Table 3.3: Value of investments within each of 2020 Force Structure Plan's domains

Domain	Program	Low range (A\$ million)	Median point (A\$ million)	High range (A\$ million)	% (based on median)
Information and Cyber		12,300	15,375	18,450	2.8%
Maritime		190,173	202,683	215,193	36.6%
Air		124,200	156,200	188,200	28.2%
Space		9,000	11,200	13,400	2%
Land		66,200	81,600	97,000	14.7%
Defence Enterprise					
	<i>Defence Enterprise Programs</i>	<i>40,000</i>	<i>49,450</i>	<i>58,900</i>	<i>8.9%</i>
	<i>Innovation System</i>	<i>2,130</i>	<i>2,130</i>	<i>2,130</i>	<i>0.4%</i>
	<i>ICT</i>	<i>No investments listed</i>			
	<i>Defence Estate</i>	<i>27,500</i>	<i>34,850</i>	<i>42,200</i>	<i>6.3%</i>
Defence Enterprise subtotal		69,630	86,430	103,230	15.6%
Total		471,503	553,488	635,473	100%

Source: 2020 FSP.

This approach results in a somewhat different breakdown from the capability investment breakdown. For example, despite the \$18.1–27.1 billion investment in infantry fighting vehicles, the Land domain falls from 20% to 14.7%, while Maritime rises from 28% to 36.6%. This is probably due, in part at least, to the capability investment funding being based on a decade view while the investment charts present a two-decade view that also includes some funds to be spent beyond the second decade—the Attack-class submarine will be spending its \$89 billion well into the 2050s, for example.

### Comparison of the 2016 and the 2020 plans

As a comparison, the domains in the 2016 IIP are listed below based on an aggregation of individual investment lines (that is, using the same methodology as in Table 3.3). Like the FSP, it presented a two-decade view to 2035, but again, because large shipbuilding projects run well beyond 2035 but all their funding was included, it distorted the relative sizes of the domains—Maritime was even bigger than it is in the 2020 plan.

Table 3.4: Value of investments, 2016 Integrated Investment Program, by domain

Domain	Low range (\$ million)	Median point (\$ million)	High range (\$ million)	% (based on median)
ISR, EW, Space and Cyber	18,144	22,519	26,894	6.3%
Key Enablers	32,221	40,446	48,671	11.3%
Air and Sealift	11,080	14,130	17,180	4.0%
Maritime and Anti-Submarine Warfare	155,200	163,450	171,700	45.8%
Strike and Air Combat	44,850	50,505	56,160	14.2%
Land Combat and Amphibious Warfare	55,320	65,820	76,320	18.4%

Source: 2016 IIP.

Since the domains aren't defined that same way in the 2016 and 2020 plans, it's not a direct apples-to-apples comparison, but we can make some observations. Probably the most notable change between 2016 and 2020 is the growth of the Air domain investments from 14.2% to 28.2% of the total. That's not surprising, considering that six of the biggest new entries to the FSP are in the Air domain:

- High-speed long-range strike, including hypersonic research (\$6.2–9.3 billion)
- Teaming air vehicles (\$7.4–11.0 billion)
- Deployed ballistic & high-speed missile defence (\$15.8–23.7 billion)
- E-7A Wedgetail replacement (\$14.0–21.1 billion)
- C-130J Hercules replacement (\$8.8–13.2 billion)
- KC-30A replacement (\$17.5–26.2 billion).

If we add to that the boost of around \$5 billion to the medium-range ground-based air defence line, that's an increase of \$75-110 billion to the Air domain.

## 3.2 The information in the Force Structure Plan

### What do the schedule bands mean?

The FSP provides charts for each domain and a broad schedule for each investment line. According to information from Defence:

the start of an arrow refers to the commencement of acquisition funding provision, with the end of the arrow indicating plans for acquisition completion (excepting some capability investments which will continue beyond 2040—i.e. Attack class submarines). Given the arrows reflect acquisition provisions, the charts provide an indication of the broad schedule for acquisition of new capabilities. However, these arrows do not specify initial or full operating capability dates.<sup>24</sup>

This is important because the time between the start of acquisition spending and initial operating capability can be considerable. Even for straightforward projects, it can be three or four years. At the extreme, such as the Future Submarine Program, it will be around 20 years. Furthermore, the gap between initial and final operating capability can be many years. For the F-35A, it will be only three years; for the future submarine, it will be over 20. That makes it difficult to know where in the schedule band in the FSP's charts we'll see actual capability in service. We've made an attempt at plotting the initial operating capability of significant capabilities in Figure A.8 in 'The DSU in eight tables'.

### Can you rely on the cost estimates?

Like the IIP and the public Defence Capability Plan before it, the public FSP presents cost bands. Those bands are very broad. Defence's justification for this is that it enables the organisation to maintain commercial leverage; if you tell industry exactly how much you're willing to spend, its tender responses will come back at that number, the argument goes. A couple of exceptions include the maritime megaprojects, which have point estimates.

Some big numbers in the FSP are just outright wrong—massively so. The F-35A is listed at \$9.9–17.0 billion. Since it's already approved, in acquisition and listed in the PBS at \$17,155 million (with an additional \$1,485 million for facilities), it seems exceedingly improbable that it will come in much below the top end of the FSP's band if Defence acquires the full 72 aircraft, particularly since the Australian National Audit Office has reported that the project is under cost pressure. For it to come in at the bottom of the band, Defence would have to stop ordering more aircraft beyond the couple of dozen it already has. Similarly, the Hawkei protected mobility vehicle (light) is listed at \$900–1,400 million, but it's already in contract and shown in the Budget papers at \$1,999 million. If there's a number that government has already approved and it's in the public domain, why not use that one?

Some of the costs have gone up considerably since 2016. The 2016 DWP and supporting IIP were meant to be the most rigorously costed plan ever, and millions were spent getting projects costed by consulting firms. Nevertheless, some estimates have gone up substantially.

But that doesn't mean all the estimates are all wrong or meaningless. There are a lot of smart people working in Defence costing projects and capabilities, and they're supported by a lot of consultants. Defence's costing methodologies increasingly rely on industry best practice and industry standard costing tools and databases.

The budgets for Defence capability projects are meant to include the cost of all fundamental inputs to capability, as Defence terms it. That is, they include not just the vehicle or aircraft itself, but everything necessary to provide actual capability, including facilities, training systems, the intellectual property necessary to maintain or modify the platform, and so on. Defence is constantly seeking to improve its estimates and make them as comprehensive as possible so that the government can understand the full cost of ownership. That's one reason why the total acquisition cost of Defence projects is substantially more than the 'sticker price' of the hardware.<sup>25</sup>

Generally, the closer we get to the start of acquisition, the more robust and reliable an estimate gets, so it's likely that the cost bands are pretty good for projects planned to start acquisition in a few years. In fact, Defence projects rarely go over budget after tender responses have been received and very rarely once they're in contract.

But the further into the future a project or capability is scheduled, the more cost estimators have to use parametric or analogous estimating techniques, which are extremely assumption dependent. This is where cost estimators have to deal with a lot of uncertainty, and cost estimates can change, not because somebody got it wrong but because key assumptions change.

Take the Land domain investment in 'Future autonomous vehicles', with a budget of \$7.4–\$11.1 billion starting around 2032. Since nobody knows what autonomous vehicles will exist in 12 years time, how you would use

them, or how many and what kind you'd need, it's hard to come up with a cost estimate. Rather, the entry is a kind of virtue signalling, essentially saying that Defence thinks autonomous land vehicles will become important and, in the grand scheme of things, about how much it is willing to spend on them compared to all of its other priorities. But the other signal it's sending is that it doesn't plan on investing substantial funds to acquire them for another decade, and until then companies interested in developing those systems will have to rely on the significantly smaller sources of cash in Defence's innovation funds rather than the big dollars in its acquisition program.

### Is the level of information adequate?

Defence is happy with the amount of information released in the plan. Not a single person I've spoken to outside of Defence think it comes close to adequate. The level of detail in the 2020 FSP isn't significantly worse than in the 2016 IIP, but both are significantly worse than in the Defence Capability Plan. That's just symptomatic of a larger issue, which is that the government and Defence won't release basic information relating to the capital program. There's no comprehensive reporting on project approvals, merely episodic and patchy media releases, for example. The public information on project approvals doesn't bear any resemblance to the government's claimed numbers of approvals. And what they are is anybody's guess. Defence has completely abandoned the use of project numbers and titles in the FSP. It's very hard to know what thing we're talking about if there isn't consistent terminology such as project numbers and titles.

Several times, senior Defence staff have told me that, if they did release more detailed information, it would only change. So? Why not release an update? The 2016 DWP promised regular online updates to the IIP. Not a single one was ever released in four years. Will the FSP be any different? It makes a commitment to 'on-going dialogue with industry ... to ensure Defence provides industry with a sufficient level of fidelity on capability to inform industry planning and choices for investment' (page 95). Arguably, it didn't meet that same commitment after 2016.

The bottom line is this: if industry is the key partner Defence says it is, and needs it to be, why not give it the information it wants and needs?

### 3.2 What kind of a force is it?

In this section, I look at the attributes of the force presented in the FSP and consider how and whether the high-level strategic setting reviewed in Chapter 1 flowed down to the force structure. This is necessarily somewhat subjective. If good strategies are ones that align ends, ways and means, there's not much detail about ways in the DSU; the operational middle is missing.

The other reason is that the FSP is rather like a Monet. From a distance, it looks like a beautiful garden and pond, but when you zoom in on individual waterlilies, they become rather vague, ill-defined blobs. It could be worse; it could be Jackson Pollock's *Blue Poles*. There's enough there to make some high-level observations.

I write in more detail about the new investment lines in Chapter 4. What follows here are observations about the nature of the force.

#### It's still the same kind of force as before

At its core, the ADF remains the kind of force Australia has had for several generations—a small one that seeks to achieve superiority through technological advantage. It's still a conventional force. It relies heavily on highly capable but exquisitely expensive manned platforms. In time-honoured fashion, existing capabilities that reach their retirement in the two-decade window of the FSP are replaced on a like-for-like basis.

While the DSU doesn't use the term 'balanced force', it's still a very broad force—and it's getting broader. As I've noted, there are many new capabilities and virtually nothing is being given up. It's a force that attempts to cover

the full spectrum of operations, from disaster relief, through grey zone operations, to high-end war fighting. And it's going to get even more active at the shaping end of the spectrum of conflict. It's a force that tries to do everything.

### There are signs this is changing

But there's also another theme in the DSU and FSP. As I note in Chapter 1, the DSU acknowledges that we can't seek conventional superiority over major powers. While the DSU doesn't use the term, it's essentially saying that we need to develop asymmetric capabilities to deter major powers. In several places, it refers to area denial, mirroring China's A2/AD strategies. Such capabilities include cyber and emergent technologies such as hypersonic weapons. There's also reference to new asymmetric denial capabilities, such as smart sea mines and smart anti-tank mines.

There are certainly funding lines in the investment plan for such things. Some could happen fairly soon or are happening already, such as enhanced funding for cyber capabilities, including offensive cyber capabilities, but, on the whole, the bulk of the funding for key asymmetric and emergent technologies is further out, which gets us to the next observation.

### It's still the *future* force in key areas

The front end of the investment program is always full. If you don't delay or cancel existing programs at the front end to create funding space for new acquisitions and capability, the new things have to go down the back end where there's some cash available. There's not a lot of evidence that Defence has delayed or cancelled major commitments at the front end, so most of the new stuff is down the back end of the first decade or in the second decade of the investment plan. On top of that, key platform projects won't deliver their first elements of useful capability for over a decade. We've attempted to map the program-level schedule out in Figure A.8 in 'The DSU in eight tables'.

Since we can't see when the capabilities in domain charts' investment lines enter service, it's difficult to tell when some of the long, ongoing funding streams for things such as missiles will deliver, but they could potentially provide a significant capability enhancement in the near term.

We should also note that key capabilities have been delivered and have entered service in the past several years (including the three air warfare destroyers, the first tranches of F-35As, significant upgrades to frigates and submarines, the ongoing digitisation of the Army, new truck fleets and so on), so the ADF's current capability is significantly better than a decade ago.

However, there's no doubt that Defence has to get better at delivering capability faster. I discuss this further in Chapter 5.

### The backbone is being strengthened

Before we look at the pointy end, let's talk about the back end, which holds everything together. A longstanding problem with Defence's investment program is that when money gets tight, platforms get prioritised over the enabling functions that allow the platforms to deliver their full potential. Things such as facilities and ICT can get neglected, leading to laments about Defence's broken backbone. However, over the past five years or so, Defence has invested in repairing its backbone. I've written before that Defence is currently in a 'golden age' of infrastructure investment. It's now over \$2 billion per year. That level of spending will continue: \$30 billion is planned for estate spending over the next decade and is outlined at a high level in Chapter 12 of the FSP (see Table 2.7 of this report for a breakdown by state and territory).

While some concerns have been raised over the past couple of years about whether the 2016 DWP's promised investment in the Northern Territory will materialise, the FSP states that, while some investments won't go ahead, 'planned capability investments, and commensurate workforce increases, combined with the US Force Posture Initiative commitments, will match the 2016 DWP's \$8 billion Northern Australia investment commitment in this decade' (page 119), which matches the figure in Table 2.7.

Moreover, Defence's efforts to understand the full cost of ownership can also be seen in its estate program. Since it's recognised that it needs to grow its workforce significantly, it's also going to need to expand its training facilities and housing. That's reflected in investment lines totalling \$11.7–17.6 billion for enabling facilities and support for workforce growth for the three services.

ICT investment is funded at \$5 billion over the decade. Details are again fairly impressionistic (there's no chart of individual investments). It's a little difficult to tell how this level of investment compares with the recent past, since the ICT investment program has fluctuated between \$245 million and \$862 million over the past seven years, averaging around \$500 million. This suggests that significant increases in funding are not planned, which could be a risk for next feature of the force.<sup>26</sup>

### There's a lot of ISR

There's also a lot of investment in intelligence, surveillance and reconnaissance (ISR) in the FSP. In fact, every domain features ISR capabilities. This includes Australian-owned imagery satellites, enhancements to the Jindalee Operational Radar Network (JORN), 'traditional' ISR platforms such as maritime patrol aircraft, and UAVs ranging from the very large Triton down to hand-held micro-UAVs. If we add to that the fact that many multi-role platforms have significant ISR collection capabilities (the F-35A is an integrated collection of flying sensors), there will be many systems collecting ISR data. And every person and system in Defence will consume it in some form. This suggests that one of the biggest challenges Defence will have will be working out how to move that data around, process it into useful information and get it back to the users who need it.

The FSP states that Defence is addressing this challenge with

additional funding for joint processing, exploitation and dissemination capabilities, and infrastructure. This includes enhanced architecture to allow the coordination and integration of intelligence, surveillance, reconnaissance, and electronic warfare capabilities across the Joint Force.

The detail is, however, at the waterlily level.

### The age of missiles

One thing that's very apparent is that the ADF has definitely entered the 'age of missiles'. There's potentially around \$100 billion in investment in guided weapons over the next two decades (Table 3.5). This includes both offensive and defensive systems across all three services. This could fundamentally change the role of the Army. With the US having left the Intermediate-Range Nuclear Forces Treaty, our army could potentially acquire land-based strike capabilities with ranges over 1,000 kilometres. That puts it in the space that's traditionally been the realm of the Air Force. Similarly, when it acquires land-based anti-ship missiles, the Army (assuming the missiles will be operated by the Army) will be in the maritime strike space that was the realm of the Navy. This will create new demands for targeting capabilities and infrastructure. Jointness will be imperative. And ballistic missile defence will create an entirely new set of requirements for ISR.

Table 3.5: Planned investment in missiles and other guided weapons

Domain	Investment	Minimum (\$ billion)	Maximum (\$ billion)	Begin	End
Maritime	Maritime guided weapons	16.1	24.2	2020	2040+
Maritime	Land-based maritime strike weapons	0.4	0.5	2024	2032
Air	Air-to-ground weapons	1.2	1.7	2027	2036
Air	Air-to-air weapons	1.7	2.5	2020	2033
Air	Air-launched strike capability	3.4	5.2	2020	2035
Air	High-speed, long-range strike, including hypersonic research	6.2	9.3	2022	2040+
Air	Medium-range ground-based air defence	4.9	7.3	2023	2032
Air	Deployed ballistic and high-speed missile defence	15.8	23.7	2025	2040+
Land	Long-range rocket and missile systems fires	0.6	0.9	2023	2029
Land	Long-range rocket and missile systems fires upgrades	1.6	2.4	2027	2040+
Land	Additional long-range rocket and missile systems fires	1.0	1.5	2028	2038
Enterprise	Weapon inventory surety	20.3	30.4	2021	2040+
Enterprise	Sovereign weapons manufacturing	0.8	1.1	2022	2032
<b>Total</b>		<b>74.0</b>	<b>110.7</b>		

Source: 2020 FSP.

### More robust force projection and amphibious capability

But this isn't a force that will just sit in Australia and lob long-range missiles at an adversary. The FSP has more robust force projection and amphibious capabilities. One of the criticisms of Defence's significantly improved amphibious capability was that it didn't have the logistics train to support a lodged land force. The FSP goes some way to rectifying that. The Navy's single sealift ship, HMAS *Choules*, will be replaced with two 'joint support vessels'. Those vessels will provide a multi-role sealift and replenishment capability both to replace HMAS *Choules* and to augment the Canberra-class landing helicopter docks (LHDs) in the sealift/amphibious capability, while also augmenting replenishment capabilities of the two new Supply-class auxiliary oiler replenishers (AORs). Also, the funding line for 'Improved sea lift capability' refers to 'access to commercial sealift under existing and/or revised standing offer panels to augment military sealift capabilities if and when required.'<sup>27</sup>

In addition, the Army's organic amphibious capability should be significantly enhanced. If it acquires a platform in the class of the Caiman-90 that's been offered for project LAND 8170, it will have greater ability to operate with partners such as Papua New Guinea and South Pacific island states (Figure 3.1).



Figure 3.1: Enhanced watercraft will improve the Army's ability to shape, deter and respond



Source: BMT.

The Air Force is also improving its ability to deploy, not just with enhancements to northern airbases within Australia but with such things as deployable hangars and repair capabilities (FSP, page 55).

### The land force is getting even heavier

Much of that amphibious capability is about moving the Army. This isn't a 'sit in northern Australia and mop up half-drowned stragglers' kind of army like we had under the defence of Australia concept in the 1980s and 1990s. The land force is continuing to get more lethal and more protected, and it's intended to be deployed. The land force seems to be better designed as a coherent armoured force; in addition to armoured fighting vehicles such as tanks, combat reconnaissance vehicles and infantry fighting vehicles, there are now supporting capabilities that can keep up with them, such as combat engineering vehicles and self-propelled howitzers. It also appears that Defence has decided that only protected vehicles will be deployed from now on.<sup>28</sup>

This does raise the question of at what point is the land force too heavy to deploy and sustain. When does the logistics train become so unmanageable that it's just not worth it? In Defence's view, at least, we're not there yet.

## 3.3 What's not in the future force

Everybody has a pet capability that they would like to see included in the plan. Here are some that weren't.

### More combat vessels sooner

Despite the assessment that we can't rely on 10 years of warning time for military threats to Australia, the FSP doesn't adjust the schedule for the Hunter-class frigates or Attack-class submarines. The first of each class is still scheduled to be ready for operations around 2030 and 2034, respectively, after which additional vessels are to be delivered on a two-year drumbeat.

Nor does the FSP include any new classes of vessels that would get more missiles or antisubmarine sensors to sea before 2030. With the delivery of the third Hobart-class destroyer complete, the Navy won't get another vertical launch cell to sea for another decade under the current plan.<sup>29</sup>

### The big strike stick: the B-21

Similarly, the FSP doesn't change the plan for air combat platforms (at least for manned ones). The delivery of 72 F-35As will be complete by 2023. The fourth combat squadron (consisting of an as-yet undetermined platform) is

still scheduled for the second half of the 2020s, as it has been for at least a decade. It may take the form of an upgrade to the Super Hornets.

I don't think anyone was seriously expecting the B-21 bomber currently under development for the US Air Force to be there. I do think, however, that in long-range strike effects it offers more than any other option available, including submarines. However, the B-21 is probably always going to be a non-starter, since virtually all of the \$30–50 billion spend would go offshore. Yet Defence is willing to spend \$15.8–23.7 billion on a deployed ballistic missile defence, which is also likely to be spent offshore. If we now think that the best defence is a good offence, why not put that money into offensive capabilities to give the other side a headache?

A more likely way forward for a new strike platform with increased range and payload over the F-35A could be an unmanned aircraft such as Boeing's Loyal Wingman, and there is a funding line of \$7.4–11 billion extending from 2025 to 2040 for 'teaming air vehicles'. At what point the aircraft will enter service, and whether they will have a strike role, aren't stated.

In short, until late in the decade, in terms of platforms, the air combat force will be very similar to what we have now. Any big step-change in capability before then will have to come from new weapons employed on current platforms.

### New capabilities dedicated to disaster relief and emergency response

Defence has made high-profile contributions to the responses to the bushfire and Covid-19 crises, and there's been significant discussion about it expanding its role and acquiring capabilities primarily intended to meet domestic contingencies. Defence's view has traditionally been that it's happy to help out in emergencies, but not to the point that it impairs its ability to prepare for war fighting or forces it to permanently prioritise people, capabilities and funding for that role over war fighting.

In the lead-up to the DSU, there was speculation that the government might direct Defence to change that position. Indeed, the DSU states:

Defence will need to enhance its support to civil authorities in response to national and regional crises and natural disasters, such as pandemics, bushfires, floods or cyclones ... The Government has directed further development of Defence capability in this area, including in relation to equipment, facilities, training, logistics and planning. (page 29)

However, there are no investment lines in the FSP specifically for such equipment. There's no mention of capabilities such as water-bombing aircraft, for example. And the Minister for Defence has stated that:

the Government is enhancing the capability of the ADF to support both domestic and international disasters. Let me be very clear—this must be done without degrading the ADF's ability to deliver core military effects.<sup>30</sup>

In short, there doesn't appear to be any change in Defence's traditional ranking of responding to civil emergencies in its hierarchy of investment priorities. Whether it makes sense to continue to use Defence assets such as MRH-90 helicopters at \$25,000/hour for roles that off-the-shelf civilian helicopters can do for a couple of thousand is debatable.

## Chapter 4: What's new in the Force Structure Plan?

### Key points

- The FSP is short on detail, and it can be difficult to compare individual investment lines in it with those in the 2016 IIP. Some 'new' lines are actually adjustments to existing programs already in the investment plan.
- Nevertheless, it's clear that there are significant new investments in all six domains.
- Major new capabilities include a deployable ballistic missile defence system in the Air domain. There's a big increase to the Army's planned long-range rocket systems. There's also very significant, sustained investment in war stocks of guided munitions.
- It looks like there's now funding for a new east coast submarine base. There's also significant funding for housing and training facilities for a larger ADF.
- Overall, the major new investments come later, generally in the second decade of the 20-year plan.

In the flurry of announcements, media releases, commentary and criticism, it's easy to lose sight of what's new and what's the delivery of things that have been in the works for a long time. In this chapter, I cover the shopping list that makes up the FSP, with a particular focus on what's new and what's changed since the previous version of the plan—the 2016 IIP.

### Apples and oranges

The FSP covers each of the six domains in a chapter (except for the Defence Enterprise domain, which is broken into further chapters). The text in each domain is structured along the lines of the 35 capability programs. Each domain also has a graphic with bars or arrows indicating very broad budget bands and schedules for individual capabilities. It pays to be careful when looking at the graphics, as not all capabilities discussed in the text are represented by bars in the graphics.

Generally, each domain has fewer entries than in the 2016 IIP. That's because some individual capabilities and projects have been amalgamated into programs. Some bars still represent individual projects (for example, 'Infantry fighting vehicle' is LAND 400 Phase 3), but some represent aggregations of individual projects ('Maritime guided weapons' includes a number of approved and unapproved projects), and some are simply 'wedges' preserving funding for future activities (such as 'Future autonomous vehicles').

The FSP's 'waterlilies' approach provides nowhere near the same level of information as the earlier public Defence Capability Plan. Like the 2016 IIP, the FSP doesn't use project names or numbers, making it difficult to compare the 2016 and 2020 programs, as it can be hard to tell whether two similarly sounding lines are the same thing, or indeed whether two quite differently sounding lines are actually the same thing.

### LRASM—new news and old

Because the government and Defence no longer consistently use project numbers and because media releases don't clearly state what stage in the acquisition process a project has reached, it can be difficult to know exactly what's new in an announcement. Take the government's announcement of the acquisition of the LRASM, in

which it was inconveniently scooped by the US's Defense Security Cooperation Agency meeting its congressionally mandated disclosure obligations in February this year. It's rather emblematic of the level of transparency and disclosure we've reached that we get better information about what's going on in our Defence Department from the US department than from our own.<sup>31</sup>

It's certainly good news that Defence is going to acquire the LRASM and integrate it onto the Air Force's Super Hornets (Figure 4.1), but the acquisition of this kind of weapon is not a new concept or a new line in the investment program: the acquisition of maritime strike weapons for the air combat capability was already in the 2016 IIP (with a schedule of 2018–2027 and a budget of \$1–2 billion). Indeed, the 2012 Defence Capability Plan already contained project JP 3023, which was to acquire a maritime strike weapon for the F-35A. The reason that the LRASM is being integrated onto the Super Hornet is that the development of the F-35A and the integration of the maritime strike weapon have been so tardy. Defence informed ASPI that a decision on the selection of a maritime strike weapon for the F-35A is now expected in the 'FY23/24 timeframe'.<sup>32</sup>

Fig 4.1: The Long Range Anti-Ship Missile—an excellent new acquisition, but nothing new to Defence's investment program



Source: US Navy.

### 4.1 Information and Cyber domain

The FSP states that the overall investment in the Information and Cyber domain is \$15 billion over the coming decade. Over the two decades covered by the plan, the combined budgets of the individual lines in the domain are between \$12.3 billion and \$14.5 billion.

#### Reshuffles and restructures

The domain is somewhat analogous to the 'Intelligence, surveillance, reconnaissance, electronic warfare, space and cyber' capability stream in the 2016 IIP, but it's reduced in size and scope. That's not because less money is going into cyber and ISR capabilities, but because investment lines have been moved to their capability managers' domains. In other words, ISR projects managed by the Chief of Air Force (such as JORN) now sit in the Air domain, for example. What are left appear to be mainly capabilities and projects managed by Defence's Chief of Joint Capabilities (a position established in 2017), and signals intelligence and cyber capabilities, which are managed by the Australian Signals Directorate (ASD).

The six funding lines in the domain's investment chart aren't tightly linked to the explanatory text in the chapter, so it's impossible to work out what money is linked to what words. There's a new line called **Network resilience improvements** funded at \$3.3–5.0 billion over the decade. There's no explanatory text and it's not clear why this

isn't part of 'Information and communications technology' in the Defence Enterprise domain. It's the same with **Network security upgrades** (\$0.7–1.0 billion). People with the luxury of following this full time might be able to make sense of it.

## Cyber

It's a little messy tracking cyber funding between 2016 and 2020, as it's not always clear from announcements whose budget the money is going into or coming out of. With the help of my ASPI colleague Tom Uren, the picture can be summarised as follows:

- \$400 million was included in the 2016 DWP to cover 900 new ADF positions and 800 APS positions. There's no way to determine whether those positions have been filled, as ASD's staffing numbers aren't public.
- The 2016 Cyber Security Strategy announced \$230 million in funding over four years that was separate from the DWP. The strategy didn't say what the \$230 million was for.
- The Prime Minister announced a \$1.35 billion package of cyber initiatives called Cyber Enhanced Situational Awareness and Response on 30 June 2020, the day before the DSU was launched. The initiatives include:
  - \$31 million for ASD to disrupt offshore cybercrime
  - \$35 million to deliver a new cyber 'threat-sharing' platform
  - \$12 million for new strategic mitigations and active disruption options
  - \$118 million to ASD to expand its data science and intelligence capabilities
  - \$62 million to ASD to deliver a national situational awareness capability
  - \$20 million to ASD to establish 'cutting-edge research laboratories'
  - \$470 million to expand the cybersecurity workforce, creating more than 500 new jobs within ASD
- According to the Minister for Defence in the same announcement, this package is 'one part of our \$15 billion investment in cyber and information warfare capabilities that will form part of Defence's 2020 Force Structure Plan.'<sup>33</sup>

So the Cyber Enhanced Situational Awareness and Response is covered in the FSP. Presumably, it's part of the funding line called **Signals intelligence and cyber capabilities** (\$3.9–6 billion), which looks like an ongoing 'wedge' of funding for ASD over the next two decades. Australia has a declared offensive cyber capability, and the FSP makes it clear that this will continue to be funded.

## 4.2 Maritime domain

The FSP states that the overall investment in the Maritime domain is \$75 billion over the coming decade. Over the next two decades, the combined budgets of the individual lines in the domain are between \$190 billion and \$215 billion. There's a lot going on in the Maritime domain—much more than just the Naval Shipbuilding Plan, which is itself enormous and growing.

## Previously announced measures

The FSP includes a number of measures that weren't in the 2016 IIP but have been previously announced.

Six **Cape-class patrol boats** (\$350 million) were announced by the Minister for Defence on 1 May 2020.<sup>34</sup> This was not in the 2016 IIP, as the Arafura-class OPVs were intended to take over the patrol and constabulary function and the Navy was getting out of the patrol boat business. The FSP says the new patrol boats are to de-risk the transition:

The procurement of six evolved Cape class patrol boats to de-risk the transition to the new Arafura class from the Navy's ageing Armidale class patrol boats. This provides better value for money than a planned life extension, lowers operational and transition risk, and supports Australian shipbuilding industry. (page 40)

However, the government's initial announcement also emphasised the industry aspects, stating that 'this will help to ensure continued employment opportunities for 400 of Austal's commercial shipbuilders in WA, with flow down benefits to Austal's supply chain.'

The FSP includes a **Pacific support vessel** 'built in Australia to support the Australian Government's Pacific Step-up initiatives' (\$180–280 million). This is part of the Pacific Step-up program announced by the government in November 2018. Defence has informed ASPI that:

the Pacific SPT (support) Vessel will be based on an existing commercial vessel, which has not yet been selected. It is intended to provide a near-continuous presence in the South-West Pacific region, supporting international engagement, capacity building and training activities. It will also provide a maritime first response capability to assist in Humanitarian Assistance and Disaster Relief situations. The Pacific Support Vessel will be an Australian Defence vessel.<sup>35</sup>

Defence has previously suggested that it could be similar to the ADV *Ocean Protector*.<sup>36</sup>

The FSP includes a **replacement for the STS *Young Endeavour*** (\$30–50 million), to be built in Australia. Then Defence Minister Christopher Pyne stated on 1 April 2019 that 'the STS *Young Endeavour* replacement project is progressing and will be due for consideration by Cabinet later this year' with the new vessel to be built in Australia.<sup>37</sup> His successor, Linda Reynolds, stated on 15 January 2020:

The Morrison Government has committed to continue the highly successful program with the replacement of the STS *Young Endeavour*, set to be introduced into service from 2023. Defence will undertake a tender and competitive evaluation process, following briefings with industry, in early 2020.<sup>38</sup>

During the election campaign last year, the Prime Minister announced that two new mine warfare vessels operating unmanned systems and a hydrographic ship would be built at Henderson in Western Australia. This was a significant change from the 2016 IIP plan to extend the lives of the existing Huon-class minehunters.<sup>39</sup> The FSP increases the scope of **future minewarfare and hydrographic vessels** to 'up to eight additional vessels, built in Australia—potentially based on the Arafura class Offshore Patrol Vessel design.' The provision is \$3.3–5.0 billion.

While the government and Defence have stated that they're committed to a **life-of-type-extension program for the Collins-class submarine**, there was no provision for it in the 2016 IIP. The FSP now includes a Collins-class life-of-type extension. The provision is \$3.5–6.0 billion, although that also appears to include sustainment costs for the extended operating lives of the submarines.

## New entries

There are a number of new entries. Not surprisingly, due to the pressure on the investment program, they generally come later in the first decade or in the second.

For those who were hoping Defence would more actively pursue large unmanned underwater systems, there's no explicit mention of the US Navy's Orca XLUUV. But there is a new line for an **integrated undersea surveillance system** with a relatively large provision of \$5.0–7.4 billion. The text holds open the possibility of this including the 'exploration of optionally crewed and/or un-crewed surface systems and un-crewed undersea systems', so this could also be an avenue for bringing systems such as Ocius's Bluebottle small USVs into service. However, the acquisition funding doesn't begin until the middle of the decade, so we're at least seven or eight years away from actual capability.

Fig. 4.2: There may be funding for acquisition of extra-large unmanned undersea vessels, such as the Orca, which is based on Boeing's Echo Voyager, in the second half of the 2020s



Source: Boeing.

One of the more intriguing new entries has no budget or schedule and is simply described as a **support and salvage vessel** 'to enable the recovery and at-sea repair of large warships', but Defence's response to ASPI's request for more details gives it a more ambitious function:

This vessel is intended to be a forward afloat support facility to maintain the capability, availability and lethality of deployed defence elements at sea or in the littoral environment. These effects will be delivered through the provision of the vessel's specialist engineering facilities, while reducing logistical constraints via the local production of specialist components from advanced on-board manufacturing capabilities ... The vessel will also have the capacity to recover damaged assets at sea, and options for this will be explored in the requirements setting phase of the project.<sup>40</sup>

This suggests that Defence is reanimating the concept of the tender—a ship that supports forward-deployed warships, allowing them to reload munitions (potentially missiles in vertical launch cells) and undergo minor repairs without needing to return to mainland bases. In essence, it's a deployable floating base. It's possible that it could also support submarines, reducing the long turnaround times associated with transits to distant operating areas. The reference to onboard capabilities such as 3D printing is also forward leaning.

There's a new line called **improved sea lift capability** with a provision of \$550–600 million that extends across the two decades. The FSP doesn't explain what this is. Defence provided ASPI with the following clarification:

the 2020 Force Structure Plan funding line for ‘Improved Sea Lift Capability’ refers to access to commercial sea lift under existing, and/or revised, standing offer panels to augment military sea lift capabilities if and when required.<sup>41</sup>

The FSP states that the government will ‘expand and rationalise the **support and logistics helicopter fleet** consistent with the expectations for larger naval operations’ with a funding line of \$1.0–1.5 billion. Since the MRH-90 currently used by the Navy for utility roles is out of production, ‘expanding and rationalising’ may mean acquiring a variant of the MH-60, providing commonality with the current MH-60R combat helicopter fleet, and handing all of the MRH-90s over to the Army.

Another new capability, also with no budget or schedule, is another indicator of a slow shift in thinking towards more asymmetric approaches. It’s described as ‘mine warfare capabilities to secure Australia’s maritime approaches, focused on **modern, smart sea mines**’. Sea mines are a highly asymmetric capability that can cause an adversary a lot of headaches for relatively little cost. Since World War II, the US Navy has lost more vessels to mines than from any other cause. It’s a good addition, although the lack of budget or schedule information suggests that it could be a while before the capability is in service.

In the second decade are **Hunter-class assurance** and **future destroyer design**. While the third and final Hobart-class destroyer has just been commissioned, in order to support continuous naval shipbuilding, the first of the class’s replacements will need to be delivered two years after the final future frigate (that is, around 2048), so starting design studies in the mid-2030s seems about right.

### Existing lines that have been modified

The cost of the **Hunter-class future frigates** has gone from >\$30 billion in the 2016 IIP to >\$35 billion in the 2017 Naval Shipbuilding Plan to \$45.6 billion in the FSP. The cost of the **Attack-class submarines** has gone from >\$50 billion in the 2016 IIP to \$89.7 billion. In contrast, the estimated cost of the **Hobart-class destroyers’ combat system upgrade** has come down somewhat, from \$4–5 billion to \$2.9–4.4 billion.

The **replacement for HMAS *Choules*** has increased from one vessel in the 2016 IIP to two vessels with expanded functionality, including replenishment as well as sealift (\$4–6 billion). The FSP also contains the first statement that they’ll be built in Australia, indicating that the Naval Shipbuilding Plan now includes large-hulled vessels. Defence provided the following description of the vessels to ASPI:

Under the sea lift and replenishment vessels investment, Defence will acquire two Joint Support Vessels. These vessels will provide a multi-role sea lift and replenishment capability to both replace HMAS *Choules* and augment the Canberra Class Landing Helicopter Docks (LHDs) in the sea lift/amphibious capability, while also augmenting replenishment capabilities of the two new Supply Class Auxiliary Oiler Replenishers (AORs). These new vessels will greatly extend Defence’s ability to project and sustain the joint force.<sup>42</sup>

There’s now a line for **Anzac-class assurance**. There are currently several activities under way to enhance the Anzacs’ capabilities. This line appears to contain the sustainment funding necessary to keep the class going beyond its originally planned withdrawal until the introduction of the Hunter class on its two-year delivery drumbeat. The last Anzac could be in service well into the 2040s.

There were a number of lines in the 2016 IIP for **maritime guided weapons**, including:

- Future Submarine Program—Weapons and systems (\$5–6 billion)
- Maritime anti-ship missiles and deployable land-based capability (\$4–5 billion)



- Maritime area air defence weapons (\$3–4 billion)
- Future Frigate Program—Weapons (\$3–4 billion)
- Destroyer Program—Area air defence weapons (\$2–3 billion)
- Evolved Sea Sparrow Missile (ESSM) Program (\$1–2 billion)

Those totalled \$18–24 billion. They’ve been replaced in the FSP by a single line called **maritime guided weapons** (\$16.1–24.2 billion), so, even though that line looks very big, it’s about the same as what was there before.

Nothing seems to have been removed from the previous investment plan, no projects underway are being cancelled and no existing capabilities are being terminated, so there are no savings to balance the new or enhanced capabilities.

### An east coast submarine base (maybe)

There’s a consensus that an east coast submarine base is necessary both for strategic reasons and to generate a sufficient uniformed workforce to crew the future submarine fleet.<sup>43</sup> Defence, however, has testified at Senate Estimates hearings that the budget for the future submarine (listed in the FSP at \$89.7 billion) doesn’t include a provision to develop such a base.

The FSP doesn’t explicitly mention an east coast submarine base, but it could be included under the **undersea warfare support facilities and infrastructure** line (\$6.8–\$10.2 billion, page 120). In response to ASPI’s question about whether this line included an east coast submarine base, Defence stated:

This includes upgraded and expanded facilities to support the doubling in size of the submarine fleet. Defence continues to conduct operational support modelling and studies to identify the most efficient and effective options for the submarine fleet, ensuring the facilities are best positioned to support the Australian Defence Force in the region.<sup>44</sup>

That’s pretty noncommittal. But this is a large amount of money compared to other maritime infrastructure projects. The combined cost of new facilities for the Hunter-class frigates and OPVs, both of which are much larger and more complex than the vessels that they’re replacing and therefore require significantly enlarged and enhanced infrastructure, is around \$1.8 billion.<sup>45</sup> The new ‘Undersea warfare’ infrastructure line is about five times as much, so it seems to be scoped to develop something big, such as a new east coast submarine base—but, if that’s the case, why not just say so?

I discuss the **Naval Shipbuilding Plan** in more detail in Chapter 5.

## 4.3 Air domain

The FSP states that the overall investment in the Air domain is \$65 billion over the coming decade. Over the two decades, the combined budgets of the individual lines in the domain are between \$124 billion and \$188 billion. There are some very significant new capabilities in the Air domain—with commensurate price tags.

### The big news

The Air Force isn’t getting any additional combat aircraft until the second half of the decade, and the focus on air combat enhancements in the short to medium term is on new weapons, rather than new platforms. In addition to the air-to-air weapons program that’s currently in acquisition, there’s a new **air-launched strike capability** investment line, which starts now and lasts until the mid-2030s. Since its provision of \$3.4–5.2 billion is

substantially larger than the \$800 million announced for the LRASM, this is presumably a broader strike program, of which the LRASM is just the first part.

But there are some very big new capabilities here. The 2016 IIP contained a line for a ‘medium-range surface-to-air missile system’ (AIR 6500 Phase 2). That’s still in the FSP, although its provision has had a substantial boost to \$4.9–7.3 billion. But now, in addition to that, there’s a line for **deployed ballistic and high-speed missile defence** at a rather eye-watering \$15.8–23.7 billion (putting it into Defence’s top five biggest projects), although its spending doesn’t start until the middle of the decade. The scale of the provision suggests that this is scoped for a high-end system such as the US Patriot surface-to-air missile or even the Terminal High Altitude Area Defense (THAAD) system. The ‘high-speed’ wording suggests that Defence wants to crack the extremely hard nut of defeating hypersonic threats. Despite the cost, it appears to be scoped only to protect deployed forces, not for homeland defence. There’s probably scope for CEA Technologies’ homegrown phased-array radars to be a part of the solution.

Fig 4. 3: Acquisition of the Patriot or the Terminal High Altitude Area Defense (THAAD) system (pictured here) would represent a major leap forward in the ADF’s ballistic missile defence capability



Source: US Army.

In addition to those two programs, project LAND 19 Phase 7B, which is delivering a **short-range air defence system** to the Army, is well underway. We’re going from a recent past in which the ADF’s only ground-based shooter was the very short range and relatively antiquated RBS-70 to a future in which it will have a state-of-the-art ground-based air defence system that addresses the full range of threats, up to ballistic missiles. That’s a good thing, but it also shows how the threat environment is rapidly becoming a much more dangerous one in which the ADF and its partners can no longer take air superiority for granted. It also indicates the overhead involved in deploying ground forces into a conflict with a near-peer adversary—the range of supporting capabilities needed to protect them becomes exponentially higher.

Defence also wants to acquire its own hypersonic weapons under another new line with the rather confusing title of **high-speed long-range strike, including hypersonic research** at \$6.2–9.3 billion. Although the explanatory text refers to ‘a development, test and evaluation program for high-speed long-range strike ... leading to prototypes’, \$9 billion is a lot just for research. Presumably, the program will also actually acquire hypersonic weapons when they become available. Considering that the US is aiming to field hypersonic weapons around 2023, that point could come soon.<sup>46</sup>

Another significant new line is **teaming air vehicles**, at \$7.4–11.0 billion. The explanatory text states that this is for the ‘acquisition of remotely piloted and/or autonomous combat aircraft, including teaming air vehicles, to complement existing aircraft and increase the capability of the air combat fleet’ (page 51). That sounds a lot like Boeing’s Airpower Teaming System, aka Loyal Wingman. While it’s generally not Defence’s way to pick a winner this far out (the prototype hasn’t even flown yet), the funding line does provide a way forward for the production and acquisition of the system, should it meet Defence’s requirements.

There’s been a line in Defence’s investment program for a long time for a fourth air combat squadron. While many have assumed that this would be another squadron of F-35As, the door has always been left open for other solutions, such as unmanned systems. That line is still in the FSP as **additional air combat capability**, with a provision of \$4.5–6.7 billion from around 2025. As UAVs are getting their funding under their own air teaming line, it may be that the Air Force will finally get its long-desired fourth F-35A squadron, but a squadron of F-35B short take-off and vertical landing aircraft would add a new tool to the air combat mix. The Air Force has consistently opposed getting F-35Bs.

A longer term challenge for the Air Force will be in addressing the block obsolescence of a number of major platforms. In the second decade, there are entries with very large budgets for the **replacement of the C-130J Hercules** (\$8.8–13.2 billion), **E-7A Wedgetail** (\$14.0–21.1 billion) and **KC-30A tanker** (\$17.5–26.2 billion). The text states that replacement fleets for all three will be expanded. This is reflected in the very substantial provisions.

There’s also a line for the **replacement of the EA-18G Growler** (\$7.6–11.4 billion). Since this starts in the second half of the 2020s, it seems very early, since the first Australian Growlers entered service only in 2015. Interestingly, the ‘Growler electronic attack enhancements’ line in the 2016 IIP (\$5–6 billion) is gone. This suggests that Defence is contemplating early retirement and replacement rather than a substantial upgrade. However, Defence has provided the following clarification regarding Growler:

Project AIR 5349 Phase 6 – Advanced Growler was introduced into the Integrated Investment Program that underpinned the 2016 Defence White Paper. This Project remains unchanged as a result of the 2020 Force Structure Plan. This project is currently pre-decisional and yet to be taken to Government for approval ... As per original Defence planning, the current life of type of the Growler is still 2035.<sup>47</sup>

This shows how the schedules in the domains’ investment line charts don’t say much about when actual capability arrives.

At the back end of the second decade is a line for **F-35 replacement evaluation and design**. Good luck with designing a 6th-generation fighter for \$300–400 million.

## Changes to the program

Defence has testified at Senate Estimates hearings that projects have been delayed in order to free up funds for higher priority acquisitions. There are no details available on what precisely has been delayed, but it looks like two significant air defence capabilities have moved to the right (that is, have been delayed). Although the IIP and the FSP don’t use project names, these are AIR 6500 Phase 1 and Phase 2. Phase 1 is the air defence battle management system that will replace the current Vigilaire system. Phase 2 is a medium-range, ground-based air defence missile, which was essentially a new capability in the 2016 IIP. Both are still in the FSP, but Phase 1 (called the **joint air battle management system**) has moved around four years to the right. Phase 2 (called **medium range ground-based air defence**) has moved around three or four years, although its provision has increased substantially, as noted above.

The project line that will enhance **Distributed Ground Station Australia** (the Air Force's capability that centralises the processing, exploitation and dissemination of imagery and signals intelligence) also seems to have moved a few years to the right.

Defence says it's still committed to the **MQ-4C Triton high-altitude long-endurance UAS**, despite its uncertain future in the US Defense Department's budget papers.<sup>48</sup> Indeed, the government recently announced the signing of the acquisition contract for the third of a likely six aircraft.<sup>49</sup> However, the FSP also states that '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 56). That doesn't exactly signal a clear commitment or definitive way forward for what's been one of the most halting acquisition strategies in living memory.

Despite the US Air Force announcing the end of production of the Reaper UAS, the FSP still contains an armed medium-altitude, long-endurance UAS line, for which the government has already selected the **MQ-9B Sky Guardian** (a variant of the Reaper).<sup>50</sup> It's taken Australia a long time to get into armed UAVs, and the FSP doesn't clarify the fuzzy schedule that has surrounded this project (the \$1.6–2.4 billion provision is spread over the full two decades of the FSP). It could be that this is another capability that's been delayed in favour of other priorities.

As with the rest of the program, there aren't a lot of savings here to balance the new capabilities. The eighth and ninth **KC-30A air-to-air refuelling tankers** that were in the 2016 IIP are gone, in favour of a large replacement of the entire KC-30A fleet in the second decade. Also, **additional C-17A aircraft** are gone—they're no longer in production, so Defence is going to increase the size of the C-130J replacement fleet. So, neither of these measures is really a saving.

## 4.4 Space domain

### A stronger commitment to sovereign control

Australia hasn't yet gone down the path of the US and established a separate space force, but space does now get its own domain, which is a step forward in signalling its importance. The FSP states that the overall investment in the Space domain is \$7 billion over the coming decade. There are only four investment lines in the domain, but, over the two decades, the combined provisions of those lines are very respectable at between \$9.0 billion and \$13.4 billion. Overall, there's a much stronger commitment to gaining sovereign control of space-based assets rather than simply obtaining access to space-based services.<sup>51</sup>

While there were significant investments in space-based communications in the 2016 IIP, the language emphasised ensuring bandwidth, resilience and redundancy but didn't specify how that would be done. The 2020 plan is more forthright, stating that the government's plans 'include **communications satellites** and ground control stations that will be under sovereign Australian control, increasing our self-reliance and resilience' (page 62). This has a provision of \$4.6–6.9 billion, with a further line of \$1.7–2.5 billion for **satellite communications assurance**.

There's a new line for **terrestrial operations in contested space** (\$1.4–2 billion) from the second half of this decade. Defence provided a clarifying email stating that this funding line is linked to the text referring to space control (pages 62–63).<sup>52</sup> The space situational awareness line is unchanged from 2016.

### Geospatial information and intelligence

Presumably for reasons of Defence theology, the geospatial information and intelligence program is not included in the Space domain but is in Defence Enterprise. As with satellite communications, in this area, too, there's a much stronger commitment to sovereign capability. While the 2016 IIP contained a \$3–4 billion

'Satellite imagery capability' line, the associated text simply referred to 'enhanced access to imagery, including imagery from satellites', leaving open whether this would be sourced commercially from allies or from a sovereign capability. Here, too, the FSP is more forthright, stating that the government's plans include the 'acquisition of a **sovereign space-based imagery capability** to enhance coverage of the Indo-Pacific region', with an initial provision of \$3.2–4.8 billion from 2020 and a subsequent \$1.2–1.8 billion for **additional sovereign satellites**.

## 4.5 Land domain

The FSP states that the overall investment in the Land domain is \$55 billion over the coming decade. Over the two decades, the combined budgets of the individual lines in this domain are between \$66 billion and \$97 billion. The FSP continues the ongoing hardening of the Army, adding more lethal and protected capabilities.

### Enhanced long-range firepower

When you decide to set up a new local production line, you also have to work out how you're going to deal with the prospect of the jobs created by that production line ending. Continuous naval shipbuilding is how the government decided to address that in the maritime space. It looks like it's doing something similar in land capabilities. Last year, during the election, the Prime Minister announced that the government would build a small number of self-propelled howitzers (SPHs) in Geelong—something that wasn't in the 2016 IIP. There's now a project for that in the FSP called **protected mobile fires**, but there are also two additional tranches (**additional protected mobile fires** and **protected mobile fires assurance**). The cost has gone from around \$1 billion to \$4.5–6.8 billion. That's quite a turnaround for a capability that couldn't even get a look-in back in 2016.

There seems to be a similar story for long-range fires. The FSP doesn't state a requirement for a local build, but the capability has gone from one tranche in the 2016 IIP at a cost of \$0.75–\$1.0 billion to three tranches of **long-range rocket and missile systems fires** for a total of \$3.2–4.8 billion. The US Army was developing a precision strike missile with a range of 499 kilometres to fit under the limits of the Intermediate-Range Nuclear Forces Treaty. With the US having now left that treaty, the range of its land-based conventional missiles could grow well beyond 500 kilometres. That would provide the Australian Army with a massive capability boost, allowing it to strike at the kinds of ranges that were previously the domain of the Air Force. The US Army is also developing land-based hypersonic weapons that could mature in the relevant time frame for this capability. It's such a transformative capability for the Army and the ADF as a whole that Defence should consider moving its schedule forward (potentially by swapping its funding with the SPH, if that doesn't upset Geelong too much ...).

Fig 4. 4: Acquisition of a weapon such as Precision Strike Missile being developed to replace the US Army's Advanced Tactical Missile System (pictured here) would give the Army a striking range potentially well beyond 500km



Source: US Army.

The Army currently has three regiments equipped with M-777 155-mm towed howitzers. Since the FSP states that a rapidly deployable, lightweight artillery capability will remain in service (with the M-777s being enhanced or replaced), the Royal Australian Artillery is set to grow considerably with the addition of two regiments of SPHs and one of long-range rocket artillery.<sup>53</sup>

### Other lines

Most of the other new lines in the Land domain are in the second decade. They include **long-range rotorcraft** (\$1.4–2.1 billion) and **next generation rotorcraft** (\$1.1–1.6 billion). Those provisions seem to be too small to replace the current MRH-90 fleet or even to acquire a small fleet of something like the V-22 Osprey tiltrotor aircraft, so it's not clear what their scope is.

Also, in the second decade is **future autonomous vehicles** (\$7.4–11.9 billion). It's definitely progress that there's a substantial funding line for autonomous systems, but the funding doesn't start until 2033, so we're at least 15 years away from those systems being in service in numbers. The Army is exploring the potential of autonomous systems, but at a level that isn't visible in the FSP. One can't but help think that it's missed an opportunity to accelerate the adoption of such systems.<sup>54</sup> The FSP still contains a substantial line for the **Tiger armed reconnaissance helicopter** replacement with acquisition funding of \$3.4–5.1 billion starting now. It's silent on whether the replacement must be manned but, since it has already released a request for information to industry specifying that the replacement must be manned, it seems that it's mind is made up.

The Army isn't planning on getting out of the tank game; in the second decade, there's a new line for **tank replacement evaluation and design**. At \$8.0–11.9 billion, one hopes that it also includes the acquisition of vehicles and not just their design. The FSP is silent on whether they could be manned or at least optionally manned.

There are more details on the Army's private navy under a \$1.4–2.1 billion line for **Army watercraft**, including 'several large amphibious vessels' and 'a fleet of inshore patrol craft ... to operate in the riverine environment'. The replacement and enhancement of the Army's current capability is long overdue and has the potential to play a significant shaping role in the Pacific Step-up. Fortunately, that funding line starts now.

There are a lot more capabilities described in the Land domain chapter than are listed in the chapter's chart of key investments. They're a mix of things: some essentially catch up with reality on the ground (such as a **special operations rotary wing capability**, which wasn't in the 2016 IIP but is already well into the capability development process); others are minor new entries that suggest a growing use of asymmetric weapons, such as **smart anti-tank mines**.

As one would expect, there's substantial continued funding for things that are now essential to the land force, such as **battlefield communications** (\$3.2–4.8 billion), **integrated soldier systems** consisting of equipment for the individual soldier (\$3.6–5.5 billion) and **tactical UAVs** (\$400–700 million).

As in the other domains, virtually nothing has been retired or cancelled to make room for the new additions. The FSP notes that Defence 'will substantially reduce the planned modernisation and consequent replacement of the **G-Wagen** fleet', as they can't be deployed due to their lack of protection. Their role will be filled by protected vehicles such as Bushmasters and Hawkeis. That makes sense in lethal environments, but it sounds like a very expensive way to do business in roles such as humanitarian assistance and disaster relief.

### Filling the Bendigo valley of death

There's no obvious line that would continue protected vehicle production at Thales's Bendigo facility once it completes the production run of the **Hawkei protected mobility vehicle (light)**, which is currently scheduled for June 2023.<sup>55</sup> Noting that Defence recommended and the government agreed in 2012 that it would spend \$221.3 million to acquire additional Bushmasters just to keep the Bendigo facility in operation pending possible Hawkei approval, it's a little odd that the future of this industrial capability beyond Hawkei has been left open.<sup>56</sup> I'd expect to see some kind of announcement in the next couple of years ensuring further work for this facility.

## 4.6 Defence Enterprise domain

The FSP states that the overall investment in the Defence Enterprise domain is \$53 billion over the coming decade. This is further broken down into Defence Enterprise programs (\$15 billion), the innovation system (\$3 billion), ICT (\$5 billion) and the Defence estate (\$30 billion). Over the two decades, the combined budgets of the individual lines in this domain are between \$69.6 billion and \$103.2 billion (see tables 3.2 and 3.3. in this brief). The Defence Enterprise domain is essentially analogous to the 'Key enablers' capability stream of the 2016 IIP, although there's been movement in and out due to the restructuring along capability manager lines discussed above.

### Even more missiles

The biggest line in Defence Enterprise programs (Chapter 8 of the FSP) is **weapons inventory surety**, at \$20.3–30.4 billion over the two decades. In fact, it exceeds all the other investment lines combined. The explanatory text states that its purpose is to increase the 'weapon inventory across the ADF to ensure weapons stock holdings are adequate to sustain combat operations if global supply chains are at risk or disrupted' (page 82). This is coupled with **sovereign weapons manufacturing** (\$0.8–1.1 billion). If \$100 billion in demand for guided weapons coupled with \$1 billion in seed funding can't jump-start an indigenous industrial capability, nothing ever will.

There's also a new line called **recapitalisation of the Reserves** with a significant funding line of \$6.3–9.4 billion. The FSP uses its typical tantalising terseness to say that this line is 'to equip and enhance the ADF Reserves to a level commensurate with the ADF in important warfighting and operational support capabilities'. The reference to warfighting suggests the Reserves are not going to become an organisation primarily focused on emergency response, as some had speculated in the wake of the last bushfire season. Since it doesn't start until 2030, it's likely to be a wedge preserving funds rather than a fully designed program just yet.

There's \$1.0–1.5 billion for **improved fuel resilience** for both deployable fuel storage and fuel infrastructure at defence bases. ASPI has been saying for some time that this is a high priority, but those funds become quite thin when spread out over 20 years.

There's no text explaining **increased airbase resilience**, which is funded to \$2.9–4.3 billion over the second decade, although this could also be intended to remedy fuel holdings. If Defence's northern air bases have to support high-tempo operations, they're going to run dry very quickly, particularly the bare bases.

I've considered the **satellite imagery** lines in my discussion of the Space domain.

### Other enterprise programs

There's a list of infrastructure investments in Chapter 12 of the FSU. Many of them were previously in the 2016 IIP. New entries include the following:

- A **new Army watercraft base** in northern Australia. The existing one is in Ross Island Barracks at Townsville, but the Northern Territory is likely to make a bid for this. The funding starts around 2025, presumably to synchronise with the watercraft line in the Land domain.
- A potential new east coast submarine base under the **undersea warfare support facilities and infrastructure** line (discussed in more detail in Chapter 3 of this brief).
- Substantial new funding lines for each of the services for **enabling facilities and support for workforce growth** totalling \$11.7–17.6 billion, all of which start now. If the states really want some of the facilities action, they should be making a bid for a piece of this very substantial pie.
- Another fuel line for **increased fuel storage capacity** (\$0.9–1.3 billion) in the second decade.

There's little detail and no investment chart for ICT (FSU, Chapter 11). I consider industry and innovation programs (FSU, Chapter 9) in the next chapter of this brief.



## Chapter 5: Defence industry issues, or how to eat elephants

### Key points

- To even stay at one-third of Defence’s capital equipment spend, local defence industry’s production will need to grow from \$2.6 billion to \$7.2 billion per year. If the government successfully increases local industry’s share, Australia’s defence industry could grow to a \$10 billion per year enterprise.
- The government will probably have to consider additional industry and innovation measures to grow Australian industry capacity and capability.
- Those measures will need to focus on developing high-value systems and components, as a focus on low-value components or the local assembly of foreign designs and systems won’t achieve either the sovereign outcomes or the local spending that the government seeks.
- The ‘hidden’ costs of continuous build programs are becoming more apparent. Effectively, we’re deliberately spending a lot more to deliver capability much more slowly than is possible. This isn’t consistent with the government’s assessment of the increasing strategic uncertainty in our region and vanishing warning times.

### 5.1 Industry policy in the Defence Strategic Update

#### Covid-19 and supply-chain security

The Covid-19 pandemic has shone a spotlight on the issue of supply-chain vulnerability. Around the world, countries are reassessing the wisdom of becoming dependent on imports of essential items, particularly from countries that might not always be reliable partners. A central element of these emerging conversations is the realisation that security and risk are just as important considerations as cost—and, for some essential supplies, much more so.

Of course, there are no quick fixes to the issue of supply-chain vulnerability. Solutions are likely to require mixes of measures, including:

- establishing new, more reliable overseas sources of supply
- maintaining more robust stockpiles
- rebuilding domestic design and manufacturing capability
- deepening production partnerships, including through co-investment in Australia by foreign firms.

There have been shocks before, and early commitment to rectifying weaknesses has wavered, but what’s new is the awareness that robust supply chains are fundamental to sovereignty and the existing vulnerabilities have to be addressed. That recognition has underpinned numerous recent policy statements by the Australian Government.

#### Defence industry policy—a continued emphasis on sovereignty

The focus of current concerns is on essential medical supplies, but ensuring the reliable supply of military equipment is also a key sovereign requirement—particularly when you have acknowledged that you can no

longer rely on lengthy warning times to prepare for conflict and crisis. The DSU notes that ‘The pandemic has also highlighted the importance of secure supply chains for Defence and defence industry, including sovereign industrial capability in some areas’ (page 6). It states that the government’s plans include ‘more durable supply chain arrangements and strengthened sovereign industrial capabilities to enhance the ADF’s self-reliance, including in the context of high-intensity operations’ (page 34).

Fortunately, the defence sector has a four-year head start due to the release of the government’s Defence Industry Policy Statement as part of the 2016 DWP. The statement was further fleshed out by the Defence Export Strategy and the Defence Industrial Capability Plan in 2018. The Defence Industrial Capability Plan defined 10 sovereign industrial capability priorities and committed to publishing implementation plans for all 10. Two have been published to date, and the FSP states that the remaining ones will be published by the end of 2020. Overall, this is a very large and comprehensive body of policy guidance supported by numerous funding measures designed to develop Australian defence industry capability.

Probably in the light of the amount of policy and a level of policy fatigue in government, the Defence Department and industry, the DSU and FSP don’t change the fundamental policy settings, although there are a few new measures that I discuss in this chapter. On the whole they are good, but if the government wants defence industry to achieve the level of sovereignty and sheer scale that it is seeking, it probably needs to do more to actively grow the industry and innovation ecosystem.

### The policy is broadly the right one

Global developments since the 2016 DWP have confirmed that there are a lot of good reasons to develop greater local industry capability. In addition to the vulnerability of global supply chains in general, there are several risks specific to defence capability that we need to manage:

- The FSP stresses that we can’t rely on 10 years of warning time. It’s easier to ramp up production rapidly from an existing defence industrial base than to start from scratch.
- Modern combat operations, whether against irregular opponents or near-peer adversaries, require so many guided weapons that they would probably consume whatever stockpiles are on hand. Moreover, those munitions can’t be quickly replaced in the global marketplace through existing production and purchasing arrangements.
- The US might not be able to supply what we need when we need it, even if it wanted to. Concurrent demands from US entities themselves may result in Australian resupply being limited or slowed, for example. Furthermore, Covid-19 is highlighting the fragility of the supply chains that US defence industry itself relies upon.
- US budget constraints may prevent it from developing the kinds of systems Australia requires at the speed we require.
- Even if Australia can acquire the systems we need in the global market, the integration of those systems into a coherent, networked whole is as important to the realisation of military capability as the individual systems. That integration is always going to be highly ‘Australian specific’ due to our environment, blend of systems, sovereign requirements and so on.

But there are also opportunities:

- Australian companies have repeatedly shown that they can develop world-leading capabilities.

- International primes have a proven track record of working with local small to medium-sized enterprises (SMEs).
- There's a solid base to build on to develop more robust Australian defence companies that can themselves become prime systems integrators in major projects.
- Australia has the potential to become a much more significant global player in defence technology as Western defence budgets stagnate or decline while Australia's increases in relative weight.
- Australia can become complementary additional source of supply for the US and other partners during conflict and crises, increasing interdependence and Australia's strategic weight.
- Greater sovereign industrial capability won't eliminate all supply-chain risks—there are too many potential points of failure—but it can minimise and mitigate them. And, in combination with judicious strategies, potentially with allies and partners, to stockpile and burden share, that can make a significant difference in times of crisis.

Neither the risks nor the opportunities mean building everything here at any cost. There's an opportunity cost to any investment that must be weighed judiciously. Value for money has to remain a key consideration, but, as we've relearned from the Covid-19 crisis, value shouldn't be assessed purely in financial terms. The ultimate assessment criterion is, does it increase sovereign military capability?

## 5.2 An elephant-sized challenge

Developing the sovereign industry capability to deliver the military capabilities set out in the DSU and FSP will be a massive challenge. Let's look at the numbers.

### How big is the elephant?

The government's defence industry policy doesn't set a target for Australian industry content in local projects, although 60% seems to have become the *de facto* minimum benchmark. Nor does it set a target at the program level. However, the Minister for Defence stated at ASPI's Strategic Vision 2020 conference, 'we are unashamedly increasing Australian industry content.'<sup>57</sup> So, it seems reasonable to assume that the government expects the local component of both the acquisition and sustainment programs to grow as the defence industry policy is implemented. In fact, achieving greater sovereign military and industrial capability requires it.

We have data for the breakdown between local (that is, in Australia) and overseas spending by Defence's Capability Acquisition and Sustainment Group, which manages Defence's acquisition and sustainment of defence major capital equipment. It's the bulk of Defence's acquisition and sustainment programs. It varies by year but, based on recent years and figures for the forward estimates, it's around 75% of Defence's total acquisition budget (the two other big chunks are facilities and ICT).

We noted in last year's *The cost of Defence* that Capability Acquisition and Sustainment Group's local acquisition spend has hovered rather stubbornly around one-third of its total acquisition spend. We've reproduced the data in Table 5.1, with updated figures for 2018–19 and 2019–20.<sup>58</sup>

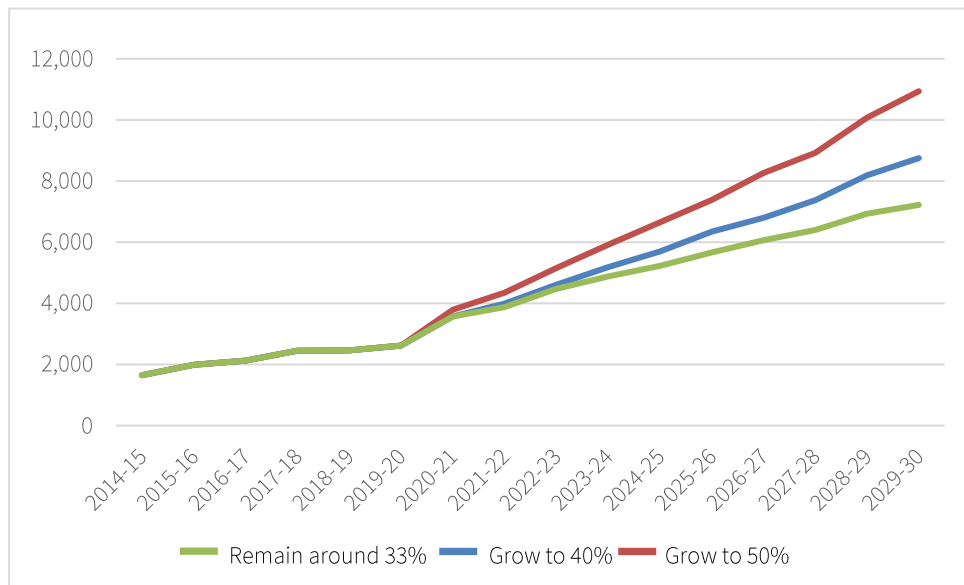
Table 5.1: Capability Acquisition and Sustainment Group, local and overseas spending (\$ million), 2012–13 to 2019–20

	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%	
<b>Total</b>	<b>16,402</b>	<b>33,899</b>	<b>50,301</b>	<b>30,353</b>	<b>15,145</b>	<b>45,498</b>
	<b>33%</b>	<b>67%</b>		<b>67%</b>	<b>33%</b>	

Source: Defence data.

This has been the case even since the release of the government’s defence industry policy in early 2016. This isn’t to say that the policy isn’t working, or that we won’t see shifts in those percentages. Rather, it’s likely to take time for that to occur. One reason is that at the moment there are some big projects happening that are sending a lot of money offshore, such as the F-35A, which is spending \$2 billion a year, nearly all offshore. But the other reason is that, as the total capital program has grown, Australian industry’s contribution has had to grow just to stay at around 33% (see Figure 5.1). So Australian industry content is growing in absolute terms, just not in relative terms. But when will we see that percentage start to grow?

Figure 5.1: Potential growth scenarios for the Australian share of major capital equipment program (\$ million)



Sources: future spending is ASPI modelling of Defence data in PBS and PAES; historical data provided by Defence.

Here’s the challenge. Defence’s total capital spend grows dramatically over the next decade by around 148%, from about \$11.8 billion to a massive \$29.2 billion. Australian industry will also have to grow dramatically just to maintain its current share. This probably won’t be too hard in facilities and infrastructure; Australian industry is good at making concrete and steel and assembling buildings. The main challenge will be likely to be competition from the states’ ambitious infrastructure programs (assuming they survive the Covid-19 budget hit). However, in the area of specialist military equipment, where Australian industry will need access to specialised skills, knowledge, machinery, intellectual property and so on, it will be more difficult.

If we also want Australian industry’s share of the growing pie to grow, then the size of the elephant it has to eat increases dramatically. In the first of the three scenarios for Australian industry’s share of the major capital equipment acquisition program over the coming decade shown in Figure 5.1, the share stays around 33% of the total (that is, the current balance between local and overseas spending remains unchanged). In the second, local industry’s share grows over the decade to 40%, and in the third it reaches 50%. The starting point in 2019–20 was about \$2.6 billion. Just to stay at a third of the total, Australian industry capability (AIC) would have to grow by 175% to \$7.2 billion. That will be challenging enough. To hit 40%, it would have to grow by 234% to around \$8.75 billion, and 50% would require a 318% increase to nearly \$11 billion.

In short, if we want Australian defence industry to increase its share of Defence’s acquisition spend, we’re looking at it reaching a point in 10 years at which it’s producing around \$10 billion in military capability per year. If it doesn’t get there, Australia will be increasingly reliant on imported defence equipment, with resultant supply-chain risks.

### 5.3 Which bits of elephant do we focus on?

One way to deal with a huge meal of elephant is to focus on eating the most nutritional parts and avoid the bits that don’t generate much industry capability or that require large premiums for little capability.

## A diet rich in steel isn't particularly nutritious

Aussie steel makes for good headlines and photo opportunities, but no amount of it is going to make much of a difference in getting to that \$10 billion spend. Much was made of the recent award of the contract for 1,500 tonnes of steel for the 'prototyping' activities for the future frigate to the Australian company BlueScope Steel AIS. Aside from the fact that this was always a contract that an Australian company was going to win, it's small beer. With a value of \$2.5 million, it's around one ten-thousandth of the 60% Australian industry content that the government is aiming for in the \$45 billion Future Frigate Program. At \$1,666 per tonne, even if there's a total of 60,000 tonnes in the program, that's at most \$100 million, or 0.2% of the total program cost.<sup>59</sup>

Moreover, such contracts do nothing to build Australian defence industry capability or sovereignty. Sixty thousand tonnes is about four days production for the Australian steel industry—and those 60,000 tonnes are spread out over 20 years,<sup>60</sup> so it's about 0.06% of its total production. Whatever it tells us about the high quality of Australian steel production, it won't change the trajectory of the Australian steel industry. That isn't to say defence projects shouldn't use Australian steel, but it just doesn't make much difference to the affordability of the project or the future of our steel industry. A sovereign steel production capability is a good thing, but it is not driven at all by Defence demand—and doesn't need to be.

## Assembling foreign-sourced components isn't much better

Setting up assembly lines to put together components sourced overseas for designs that were developed overseas also provides little nutritional value. This would include things such as the local build of self-propelled howitzers (SPHs). When the government announced during last year's election campaign that it would build SPHs in Geelong, the announcement was somewhat surprising, since:

- no requirement or funding for SPHs was identified in the 2016 IIP
- SPHs don't obviously fit into any of the 10 sovereign industrial capability priorities, so there was no clear justification for paying a premium to build them in Australia
- there's likely to be minimal return for the premium paid to build them here.

We can unpack that last point because the Department of Finance publishes its costings of election promises.<sup>61</sup> Finance costed a production run of 30 SPHs at \$1,063.1 million including a 30% premium for a local build. That works out at \$245.3 million.<sup>62</sup>

What do we get for that premium? The proposal stated that it would generate 350 jobs. That seems extremely high. In Finance's cost estimate, the mature production phase of the project lasts for only 4–5 years, which would mean it would take 350 people to build seven or eight SPHs per year. In contrast, the assembly line being set up in Queensland to assemble the Boxer combat reconnaissance vehicle requires 330 people for a production run of 186 vehicles over a similar period, that is, about the same number of people to assemble six times as many units. But assuming there are 350 jobs, the premium effectively results in a subsidy of \$700,000 per job, or around \$150,000 per job per year. Of course, if there are fewer jobs, the subsidy per job is higher.

That premium might be worth it if it generates high Australian industry content. Finance's costings don't answer that, but we can get a rough idea from the Boxer vehicles in Queensland. The FSP states that the AIC component of that project will be \$1.3 billion. Since the government had previously claimed there would be 50% AIC in a project with a budget of \$5.8 billion, that number seems to fall short. When asked for clarification, Defence stated:

In 2018, Rheinmetall Defence Australia was contracted to deliver 211 Boxer 8x8 Combat Reconnaissance Vehicles (CRV), under an acquisition contract valued at approximately \$3.3 billion and a support contract valued at approximately \$192 million over its seven-year term. Rheinmetall's Public Australian Industry Capability (AIC) Plan advises an Australian expenditure of '\$1.685 billion in the acquisition phase'. The AIC commitment of \$1.3 billion referred to in the Defence Strategic Update excludes Australian taxes, custom duties, insurances, bank fees, infrastructure, corporate overheads, goods and services. When these values are included, the total AIC value is \$1.685 billion.<sup>63</sup>

So the AIC component in the acquisition phase is \$1.3 billion, or 39% of \$3.3 billion. Even when we add the other elements, such as taxes (which are not AIC *per se*, but are potentially broader economic benefits), we still only reach 51%.

It's hard to see the AIC component of the SPH build being greater. Nobody has suggested that we design it locally from scratch, so it will be a mature overseas design, so there will be minimal local intellectual property. It's highly likely that high-value subsystems such as the fire control system, engine, transmission and gun will be imported. In short, we could be paying a premium of \$245 million to realise around \$500 million in AIC, which could consist largely of wages.

The risk for these type of vehicle projects is that they fail to produce much sovereign industry capability or address supply chain risks and vulnerabilities. Once an assembly line is set up, there can well be pressure to retain the jobs by making further orders. That can result in continuing 'low nutritional value' local industry involvement, with high value design and component production remaining offshore. Even vehicles designed in Australia are not immune to supply-chain risks; the Hawkei protected vehicle project recently ground to a halt for nearly a year because the Austrian company that supplied its engine became insolvent.<sup>64</sup>

Overall assembling vehicles designed overseas out of imported components does little to maximise sovereignty, increase Australian content or address supply-chain risk. In fact, it can take resources (people, money, attention) away from activities that can generate high value outcomes.

### Valleys of death versus continuous builds

As noted above, once you set up a production line, there's an imperative to keep it going or you face the unpalatable prospect of a 'valley of death' in which workers are laid off once the capability is delivered. To avoid a valley of death you need to generate continuous work.

It's perhaps not surprising, then, that the FSP added two further tranches of SPHs with a total value ranging between \$4.5 billion and \$6.8 billion. The mid-point is \$5.65 billion. If we assume that Finance's estimate of a premium of 30% is appropriate, then that equates to \$1.3 billion.

With Australian manufacturing in such a parlous state, you could perhaps argue that investment in any form of manufacturing has got to be a good thing, but that ignores the opportunity cost. Why spend money on activities that don't increase military or industrial capability and sovereignty, when you could be investing in areas of research and advanced manufacturing that do, and are key areas of future technological advantage? We can argue endlessly about whether that \$1.3 billion premium generates broader economic benefits, but it doesn't generate military capability. In fact, it's a loss of \$1.3 billion in military capability. And nowhere in the hundreds of pages of defence industry policy does it say that the increase in defence funding is intended to cover local premiums. Or, put another way, developing local industry capability should result in greater military capability that addresses the strategic challenges identified in the DSU, not less.

## It takes an ecosystem

Developing the ability to generate high value inputs doesn't just happen by itself. The current defence industry policy acknowledges this. Historically Australian governments' defence industry policy has been a pendulum that has swung over time between two different policy positions. One is based on relying on the global market, the other on developing greater sovereign capability. The difference isn't just about where equipment is built. The two positions rely on completely different ecosystems. For example, in the first approach you don't need to invest much in R&D (the original designer of the thing you're buying off the shelf has done that already), but in the second approach you do. That ecosystem can't thrive without it. There's a whole range of costs that need to be factored in to keep that ecosystem healthy, particularly if it is going to be robust enough to withstand buffeting from shocks and crises in the wider world, whether induced by pandemics or military conflict.

There will always be some element of what we can call the 'Mulwala factor'. The Australian National Audit Office reported that, from 1999 to 2015, the Department of Defence paid \$526 million for munitions produced by facilities in Mulwala and Benalla, but it spent a further \$1.9 billion building, operating and maintaining the facilities to keep the industrial capability ready for possible war.<sup>65</sup>

That's an extreme example, but the Mulwala factor means that there will always be an overhead to keeping sovereign industrial capability ready to surge and meet demand in time of crisis when we need it most. There can be good reasons to pay that overhead to help keep the ecosystem healthy. There are also times when the cost isn't warranted. This could include spending more to slow production down to ensure continuous build, as we discuss below in the context of shipbuilding. But you can't decide whether it's worth it unless you have transparency about the overhead you're paying.

## Industry funds

The government has recognised the need to invest in to grow and sustain a healthy defence industry ecosystem. One of the most powerful elements of the concept of industry as a fundamental input to capability, which was a key part of the 2016 defence industry policy, is that it gives Defence the latitude, and in fact the obligation, to actively create the future industry environment it needs, rather than sitting back and hoping it will be there when the time comes.

The government is investing in developing that ecosystem, but is it doing enough to grow it to the point that it can generate \$10 billion in military capability each year? And at a rate that it can generate the military capability needed quickly in an era in which warning time has evaporated? Here's what it's currently doing. According to Defence, the Centre for Defence Industry Capability administers the following defence industry grant programs:

- Capability Improvement Grant, funded at \$3 million annually
- Sovereign Industrial Capability Priority Grant, funded at \$17 million annually
- Defence Global Competitiveness Grant, funded at \$4.1 million per year from 2018–19 to 2028–29
- US–Australia International Multidisciplinary University Research Initiative, funded at \$25 million from 2018–19 to 2027–28.<sup>66</sup>

That's \$26.5 million per year. To that we could add a range of science, technology, engineering and mathematics (STEM) initiatives in the education and training sectors. One could argue that's not a lot if you want to drive towards a \$10 billion per year industry.



## Innovation funds

Another measure to boost the development of high-value Australian defence technologies is investment in R&D. Defence's two main innovation funds are the Defence Innovation Hub (DIH) and the Next Generation Technologies Fund (NGTF). In the 2016 DWP, the former was funded at \$640 million over the decade and the latter at \$730 million. That's under 0.4% of Defence's annual budget. The FSP states that the NGTF has invested more than \$164 million so far, or around \$40 million per year. That suggests that it has underachieved in moving funds out the door in the four and a half years since the DWP since it needs to be moving around \$70 million per year. The DIH has done better at \$237 million.<sup>67</sup>

In the DSU, the DIH has received a small boost to 'over \$800 million' over the next decade. That will basically allow it to keep up with inflation. The NGTF has received a more substantial increase to 'approximately \$1.2 billion' over the next decade. It's going to need that to support the ambitious program of STaR Shots released in its recent 'More, together: Defence Science and Technology Strategy 2030'.<sup>68</sup> It's also going to need to triple the amount of funding it can move annually from around \$40 million a year to \$120 million if it's actually going to spend its money.

There's also a new Capability Acceleration Fund. It gets \$130 million over the decade—but the catch is that it doesn't start until the middle of the decade. Despite its relatively modest funding, if it's able to help link the innovations coming through the NGTF and DIH to the multi-billion-dollar budgets of Defence's major projects, it could potentially play a major role in the commercialisation of Australian innovation.

Overall, the innovation funds are still less than 0.4% of Defence's total funding over the decade. That does make one question its commitment to technological innovation. It's hard to think of leading, technology-based companies in the private sector investing so little in R&D. The DSU, like previous white papers, notes the accelerated pace of technological change in the region. This does seem to require considerably more R&D as a share of defence spending than is in the DSU's funding model.

And aside from the scale of investment, it's not producing capability rapidly. In response to our enquiry about whether any DIH contracts have resulted in production contracts or in-service ADF contracts, Defence responded:

Most contracts awarded by the Defence Innovation Hub have been for innovations at the early stages of maturity. Over time, the Defence Innovation Hub is increasing its investment in innovations at higher levels of maturity, and is increasingly transitioning successful projects to follow-on phases of development.

Multiple Defence Innovation Hub technologies are approaching the stage at which they could be considered for potential acquisition—such as unmanned surface vessels, small unmanned aerial vehicles, body armour, mobile targets, ship-borne satellite antennas, and a joint terminal attack controller training capability.<sup>69</sup>

Put another way, none of the investments made by the NGTF and DIH over the past four and a half years has yet resulted in commercialisation or capability. This isn't to say the funds won't generate capability. It's just that they aren't generating capability fast. In an era of vanishing warning time, we need to do more, faster.

## Growing meaningful AIC

No one is suggesting that the Australian defence industry has to get there alone. Foreign primes will necessarily play a major role in delivering military capability and developing AIC, with deeper investment in local R&D and production as a necessary piece of their contribution. It's clear that the primes have got the message that, to be

considered for local build projects, they need to develop robust AIC plans that generate enduring local industry capability. Those plans are public. The FSP also states that:

To ensure support for Australian industry, the Government is establishing an independent AIC audit program in 2020. The audit program will investigate and report on prime contractors’ performance in delivering their contracted Australian industry obligations. The Government proposes to enhance the AIC contractual framework to give greater prominence to AIC terms and increase enforceability using contractual and non-contractual mechanisms. The AIC Program was expanded in 2019 to include non-material and infrastructure procurement. (page 91)

This is something that local SMEs have been crying out for and is a welcome development.

However, if we can’t get beyond the 50–60% that seems to be about the cap for local build projects based on the assembly of foreign designs, we aren’t going to get close to that \$10 billion point and the military and industrial sovereignty that that money is meant to deliver. The numbers don’t add up. We’re always going to buy a lot of high-cost systems overseas—there are many lines in the FSP that will be acquired from overseas primes (such as the replacements for the Air Force’s Growler, Wedgetail, C-130J and tanker fleets). To compensate for that, we need to boost the value of local components in the systems that are assembled or built here. If we can’t, getting beyond a one-third local spend won’t happen. This isn’t just a matter of keeping dollars in Australia. It’s a matter of sovereignty; the more imported components we’re dependent upon, the more points of potential supply-chain failure we face.

Fig. 5.2: CEA Technologies’ CEAOPS operational radar—precisely the kind of capability needed to boost Australian industry content in local build projects and increase export success



Source: Defence Image Library.

### Sovereign weapons manufacturing

There are signs that the government is willing to make greater investments in order to develop greater local industry capability and overcome supply-chain risks. The FSP contains a new line called ‘sovereign weapons manufacturing’, with a provision of \$0.8–1.1 billion. The supporting text states that the government is ‘exploring

the potential for a new sovereign guided weapons and explosive ordnance production capability to mitigate supply risks, especially for those munitions with long lead-times’ (page 82).<sup>70</sup> This is a welcome development since guided weapons are fundamental to modern war fighting. But, again, if this doesn’t develop beyond the local assembly of imported components, it will have little impact on local industry capability, sovereignty or supply-chain security. Instead of stockpiling weapons made overseas, we’ll simply be stockpiling their components made overseas for eventual local assembly. Granted, it’s unreasonable to think we’ll immediately be able to design guided weapons from scratch, and, initially, local builds under licence will be necessary to deliver military capability quickly.

But there’s no reason to think Australia doesn’t have the capacity to reach the point where it can design and build its highest priority weapons. Small countries such as Israel, Sweden and Norway have done so. Australian SMEs already make many of the kinds of components needed in modern guided weapons. However, programs such as the FSP’s sovereign weapons manufacturing must be designed that way from the outset to get there. Again, that requires significant investment in developing the necessary ecosystem. The guided weapons ecosystem can also contribute to and draw from other areas of Australian high-tech industry, such as its growing space sector because of commonalities in propulsion, guidance, communication and sensor systems.

**Exports**

There don’t appear to be any new measures to support defence exports beyond those implemented since the 2016 DWP. According to Defence, ‘The Defence Export Strategy is funded at \$200 million (\$20 million annually) from 2018–19 to 2028–29.’<sup>71</sup>

There’s no comprehensive data on defence exports, so it’s hard to know whether the policy is succeeding. Overall, the available information is anecdotal.<sup>72</sup> There have been various announcements about export contracts achieved by Australian companies, but many of them would probably have occurred without the export policy.

The government’s unwillingness to publish more comprehensive data results in the now standard *kabuki* dance at Senate estimates hearings in which the Greens senators request information on the nature and destination of defence exports while Defence denies them on the grounds of commercial confidentiality. Other countries manage to release much more data; there’s no real reason why Australia can’t do better.

One of the few sources of data, the Stockholm International Peace Research Institute, suggests that Australia’s global ranking as an arms exporter varies but averages around 20th (Table 5.2). While Australia jumped from 27th to 16th last year, that’s after it fell from 16th to 27th the previous year. Even at 16th there’s still a long way to go to hit the government’s goal of being 10th<sup>73</sup>. Currently, with 148 million trend indicator values (TIVs), we’d have to leapfrog established exporters such as Turkey (13th, with 235 million TIVs) and Sweden (14th, 206 million TIVs), and even bump out Israel (10th, 369 million TIVs).<sup>74</sup>

Table 5.2: Australia’s global ranking as an arms exporter, 2014 to 2019

	2014	2015	2016	2017	2018	2019
Australia’s global ranking	19	21	19	16	27	16
Trend indicator values (millions)	97	87	134	98	38	148

Source: SPRI Arms Transfers Database, Stockholm International Peace Research Institute, [online](#).

There’s still some wishful thinking about exports in the DSU and FSP, including hopes for potential exports of armoured vehicles. Nevertheless, some of the export contracts recently achieved by companies such as EOS for

its remote weapons stations and CEA Technologies for phased-array radars are for precisely the kind of technologically advanced, high-value systems that the export policy is aiming to boost. More exports of that kind will push Australia up the rankings.<sup>75</sup> Again this reinforces the need to focus on the local development of high-value systems, rather than local assembly on imported components.

## 5.4 The Naval Shipbuilding Plan

The Naval Shipbuilding Plan (NSP) is the largest chunk of elephant. It was originally released in May 2017 and is a key element of the government's push to increase defence industry capability and sovereignty. The FSP foreshadows the release of an updated NSP at the end of this year (page 35).

### The original components of the plan

The government and Defence have made considerable progress in implementing the NSP, both in progressing individual projects and in developing the enabling capabilities (such as shipyard construction, analyses of workforce requirements and the establishment of training programs).

There were originally three streams consisting of submarines, major surface combatants and minor war vessels (although there are effectively four streams, since there's a 'steel' minor war vessel substream centred on Lürssen and CIVMEC's production of the OPV and an 'aluminium' substream centred on Austal's patrol boats). The first four projects in the plan are making progress: the future submarine and future frigate projects are conducting design activities, and the construction of their shipyards is progressing; the OPV project has started construction in both Osborne in South Australia and Henderson in Western Australia; and the Guardian-class Pacific patrol boats are being regularly provided to their recipients. Many risks, particularly in the frigate and submarine programs, remain.

One of those risks is cost risk. With the estimate for the future submarine now at \$89.7 billion and the future frigate at \$45.6 billion, the original NSP has gone from \$89 billion to \$140.5 billion—a 58% increase.<sup>76</sup> The huge growth in Defence's capital investment funding will be needed.

### Additions to the plan

The FSP includes several new domestic shipbuilding projects that will be built in Australia (discussed in more detail in Chapter 4), bringing the program to around \$150 billion:

- future mine warfare and hydrographic vessels comprising 'up to eight additional vessels, built in Australia—potentially based on the Arafura class Offshore Patrol Vessel' (\$3.3–5.0 billion)
- the recently announced six additional Cape-class patrol boats (\$350 million)
- two Australian-built multirole sealift and replenishment vessels to replace HMAS *Choules* (\$4–6 billion)
- a vessel 'built in Australia to support the Australian Government's Pacific Step-up initiatives' (\$180–280 million).

The FSP is silent on where several other new classes of vessels will be built, including the replacement of the ADV *Ocean Protector*, replacement Navy landing craft, a new 'salvage and repair vessel' and the Army's new watercraft. But they are included in the DSU fact sheet on naval shipbuilding which explains the government's plans for continuous naval shipbuilding. In fact, *all* of the Navy and Army's future vessels are on the fact sheet, which implies that all future ADF vessels will be built in Australia. In response to our request for clarification, Defence stated that there will 'further guidance' in the update to the NSP to be published later this year.

The first two are clearly part of the minor war vessel stream and suggest that the government wants to sustain continuous construction in both the steel and aluminium substreams; the ministerial media release announcing the build of the additional Cape-class patrol boats emphasises the industry aspects, stating that ‘This will help to ensure continued employment opportunities for 400 of Austal’s commercial shipbuilders in WA, with flow down benefits to Austal’s supply chain.’<sup>77</sup>

But how the other two fit into the NSP isn’t clear. The kinds of capabilities the FSP describes for the replacements for HMAS *Choules* suggest they could be at least a similar size (16,000 tonnes). Defence has described them as joint support vessels, which suggests they could be even larger (Figure 5.3).<sup>78</sup> That could exceed the capability of the new shipyard built for the future frigate, which was designed to build vessels up to 10,000 tonnes. If they don’t fit an existing stream will they be part of a new continuous build stream for large-hulled vessels? Is there sufficient demand for vessels to support a continuous build cycle in large vessels with the associated overhead that is becoming increasingly apparent? The simple numbers of vessels of this kind in the Navy would seem to indicate that this is unlikely to be economically sensible or industrially sustainable.

Fig 5.3: Joint support vessels, like the Royal Netherlands Navy’s 27,800 tonne HNLMS *Karel Doorman*, are big ships—much bigger than anything in the original Naval Shipbuilding Plan



Source: Royal Netherlands Navy.

### The hidden costs of continuous build

Our final point is one of the most important ones. Continuous shipbuilding has the potential to bring some elements of the cost of shipbuilding down (for example, by reducing the start-up costs associated with beginning projects from scratch), but, in addition to the usual premiums associated with local builds (such as Australian wage structures), there are ‘hidden’ costs that we have previously written about.<sup>79</sup> They include:

- stretching out build cycles, resulting in greater cost through both inefficient built processes and cost escalation
- potential early replacement of vessels before a full return on investment
- a continual requirement to operate multiple classes simultaneously (for example, the Collins and Attack classes) with resultant sustainment overheads.

These costs are becoming more apparent. For the first time (as far as I am aware), the FSP acknowledges the substantial additional costs associated with continuous naval shipbuilding. It states that continuous build has driven the increase in cost of the future frigate from >\$30 billion in the 2016 IIP to \$45.6 billion in the 2020 FSP:

The Government has also prioritised developing a sustainable, continuous shipbuilding industry to end the 'boom and bust' cycle of naval shipbuilding, delivering sovereign capability and certainty for industry. In its decision to approve the Hunter class frigate program, the Government allocated additional funding to enable construction of ships at a deliberate drumbeat over a longer period of time than originally planned to achieve a continuous shipbuilding program.

In plain English, that says that continuous naval shipbuilding results in higher costs due to the drawn-out construction drumbeat that's necessary to ensure continuous work when you have a total fleet of only 12 surface combatants. Or, put another way, we're paying a lot more to get capability a lot later than if we structured the program to deliver in the most efficient and cost-effective way. This moves the frigate capability in the opposite direction to the trajectory of our strategic environment, which, as the DSU describes, is deteriorating more rapidly than projected in 2016.

Defence provided ASPI with the following 'offsets', which it claims justify the additional cost:

- the value achieved through developing our national naval shipbuilding capability and supply chains
- generating multigenerational employment opportunities
- providing the domestic defence industrial capability to transition to building the replacement for the Hobart-class destroyers immediately after batch 3 of the Hunter-class frigates is completed.<sup>80</sup>

However, none of those 'benefits' is a directly military one. And it's probably possible to achieve those benefits without artificial extending the build process.

One could possibly justify this additional cost as a very large example of the Mulwala effect (that is, paying a premium to have the industry capability on hand for when you need to surge it). But if now isn't the time when we need to surge, what time would be? The DSU states that we can't rely on 10 years of warning time. The Prime Minister has stated that 'we have not seen the conflation of global, economic and regional and strategic uncertainty now being experienced here in Australia in our region since the existential threat we faced when the global and regional order collapsed in the 1930s and 1940s.'<sup>81</sup> There's no doubt that the government is absolutely sincere in that assessment, but the FSP doesn't deliver a single new combat vessel before the first Hunter-class frigate in 2030 on current schedule—somewhat ironically, 10 years away. The Navy doesn't get a single additional missile cell to sea before then. Surely now's the time to be spending to accelerate delivery, not spending billion-dollar premiums to slow it down. Why are we prioritising jobs for future generations of shipbuilders over capability for current servicemen and women who may be called upon in the near future to use it?

## Acronyms and abbreviations

A2/AD	anti-access, area-denial
ADF	Australian Defence Force
AIC	Australian industry capability
APS	Australian Public Service
ASD	Australian Signals Directorate
DIH	Defence Innovation Hub
DSU	Defence Strategic Update
DWP	Defence White Paper
FSP	Force Structure Plan
GDP	gross domestic product
ICT	information and communications technology
IFV	infantry fighting vehicle
IIP	Integrated Investment Program
ISR	intelligence, surveillance and reconnaissance
JORN	Jindalee Operational Radar Network
LHD	landing helicopter dock
LRASM	Long Range Anti-Ship Missile
NGTF	Next Generation Technologies Fund
NSP	Naval Shipbuilding Plan
OPV	offshore patrol vessel
PAES	Portfolio Additional Estimates Statements
PBS	Portfolio Budget Statements
R&D	research and development
SME	small to medium-sized enterprise
SPH	self-propelled howitzer
TIV	trend indicator value
UAS	unmanned aerial system
UAV	unmanned aerial vehicle
USV	unmanned surface vehicle
XLUUV	extra large unmanned undersea vehicle

## Notes

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<sup>1</sup> *Strategic vision: the future of Australia's defence*, webinar, ASPI, Canberra, 2020, [online](#).

<sup>2</sup> Linda Reynolds, speech at Royal Australian Navy Sea Power Conference, 8 October 2019, [online](#). In some regards, some passages of the 2016 DWP seem like quaint relics after three-and-half years of the Trump presidency and more recently the Covid-19 pandemic: 'The United States will remain the pre-eminent global military power over the next two decades ... The global strategic and economic weight of the United States will be essential to the continued stability of the rules-based global order on which Australia relies for our security and prosperity ... The world will continue to look to the United States for leadership in global security affairs and to lead military coalitions that support international security and the rules-based global order' (page 41).

<sup>3</sup> For example, the 2013 DWP stated, 'Some competition is inevitable, but both seek stability and prosperity, not conflict. On this basis, Australia sees the most likely future as one in which the United States and China are able to maintain a constructive relationship encompassing both competition and cooperation ... Both countries have a clear interest in preserving regional stability and security. We expect that both the United States and China will work hard to maximise cooperative aspects and minimise the competitive elements in the relationship' (page 10). Department of Defence, *Defence White Paper 2013*, Australian Government, 2013, [online](#).

<sup>4</sup> Some illustrative passages from the 2016 DWP include: 'Events during the three years since the release of the last Defence White Paper in 2013 demonstrate how rapidly Australia's security environment can change' (page 30); 'Australia's strategic circumstances can change quickly, and we must be prepared to respond quickly and effectively when our interests are threatened, either by state or non-state actors' (page 32); 'we can expect greater uncertainty in Australia's strategic environment over the next two decades' (page 32). Department of Defence, *2016 Defence White Paper*, Australian Government, 2016, [online](#).

<sup>5</sup> 'We have been a favoured isle, with many natural advantages for many decades, but we have not seen the conflation of global, economic and strategic uncertainty now being experienced here in Australia in our region since the existential threat we faced when the global and regional order collapsed in the 1930s and 1940s.' Prime Minister Scott Morrison, Address—Launch of the 2020 Defence Strategic Update, 1 July 2020, [online](#).

<sup>6</sup> Hugh White, 'Morrison's defence fantasy', *Australian Foreign Affairs*, 8 July 2020, [online](#).

<sup>7</sup> Van Jackson, 'The risks of Australia's deterrence wager', *War on the Rocks*, 20 July 2020, [online](#).

<sup>8</sup> Or that the only reason to strike an opponent's homeland is to achieve deterrence by punishment. As a hypothetical example, should China seek to seize Taiwan through an amphibious assault, Taiwan and the US would not only seek to destroy Chinese vessels at sea and aircraft and missiles in the air, but would target its ports, air bases, barracks and munitions depots in China in order to reduce its ability to project military power. That's deterrence by denial—directly stopping an opponent from achieving its military goals.

<sup>9</sup> The 2016 DWP doesn't use the term.

<sup>10</sup> The 2016 DWP's defence funding line included both the Department of Defence and the Australian Signals Directorate (ASD). Although ASD became a statutory agency on 1 July 2018 and has had separate financial statements in the Defence PBS from 2018–19, the 2020 DSU's funding line continues to include ASD. This permits straightforward comparisons between the DWP and DSU funding models. However, care needs to be taken when comparing the DWP/DSU funding line for the Defence portfolio (that is, the Department of Defence and ASD) with the Department of Defence's PBS statements. The department's share of the total portfolio is nearly 98%, so conflating the two doesn't lead to errors of magnitude but can create glitches that are more significant than rounding errors.

<sup>11</sup> Since the 2020–21 PBS hasn't yet been issued, this assessment for 2019–20 is based on the updated estimate in the Defence PAES from February 2020, not actual outcomes.

<sup>12</sup> I've discussed this issue more comprehensively in Appendix 2 of *The cost of Defence: ASPI Defence Budget Brief 2019–20*, [online](#).

<sup>13</sup> To be more precise, it takes the annual nominal growth rate of the final three years of the old model (5.4%) and extends it out for a further four years to 2029–30.

<sup>14</sup> According to the US government's Bureau of Economic Analysis, [online](#).

<sup>15</sup> At the time of the 2016 DWP, it was actually \$193 billion, but as we move through time the funding for the coming decade grows, so it would have reached \$200 billion within a year or two.

<sup>16</sup> A budget factsheet published with the DSU and FSP ([online](#)) provides a breakdown of the budget into acquisition, workforce, sustainment, operating and operations for three first, middle and last years of the decade: 2020–21, 2025–26 and 2029–30. We've used these three years to roughly model the whole decade.

<sup>17</sup> The public service picture was complicated by the separation of ASD from the Department of Defence, and, since ASD's staffing is classified, it's difficult to track how many of the 800 positions have been filled.

<sup>18</sup> Email from Defence media, 17 July 2020.

<sup>19</sup> Based on the figures provided in the DSU budget factsheet of \$13,504 million in 2020–21 and \$19,229 million in 2029–30, [online](#).

<sup>20</sup> This isn't new. You'd probably have to go back to the retirement of the Navy's aircraft carrier HMAS *Melbourne* in 1982 to find a significant capability that ended without being replaced.

<sup>21</sup> For more detail, see Marcus Hellyer, 'Australia's defence budget in the age of Covid-19: unsustainable sustainment?', *The Strategist*, 23 June 2020, [online](#).

<sup>22</sup> The new system always costs more. In a decade of reviewing literally hundreds of Defence projects I saw only one that didn't seek additional sustainment funding. That was a case of a capability being outsourced to the private sector. But since it sounded too good to be true, we still programmed additional sustainment funding just in case.



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<sup>23</sup> For example, none of the Navy's large amphibious ships was in the 'Maritime and anti-submarine warfare' stream managed by the Chief of Navy; two were in 'Land combat and amphibious warfare' managed by the Chief of Army; and the third was in 'Air and sea lift' managed by the Chief of Air Force.

<sup>24</sup> Here's Defence's full response: 'Within the 2020 Force Structure Plan, the arrows within the domain investment charts refer to the periods in which acquisition funding is currently provisioned for respective capabilities (unless specified in the notes, sustainment funding provisions are not included in these charts). Specifically, the start of an arrow refers to the commencement of acquisition funding provision, with the end of the arrow indicating plans for acquisition completion (excepting some capability investments which will continue beyond 2040-i.e. Attack class submarines). Given the arrows reflect acquisition provisions, the charts provide an indication of the broad schedule for acquisition of new capabilities. However, these arrows do not specify initial or full operating capability dates.' Email from Defence media, 27 July 2020.

<sup>25</sup> I show how a sticker price of \$1 billion can become over \$3 billion when a project is properly costed in Chapter 7 of *The cost of Defence: ASPI Defence Budget Brief 2018–19*, [online](#).

<sup>26</sup> The challenge in making any reliable assessment of the ICT program is that the reporting on it is the poorest among Defence's capital programs, at both the program and individual project levels.

<sup>27</sup> Email from Defence media, 24 July 2020.

<sup>28</sup> 'Defence will substantially reduce the planned modernisation and consequent replacement of the G-Wagon vehicle fleet. Due to a lack of protection, these vehicles will not be deployable to future battlefields and their role will be accommodated by other vehicles such as the Bushmaster, Hawkei and heavy truck protected mobility fleets' (FSP, 76–77).

<sup>29</sup> I suggest one way to do more faster at relatively low cost in 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](#).

<sup>30</sup> Linda Reynolds, 'Speech—Australian Strategic Policy Institute', 2 July 2020, [online](#).

<sup>31</sup> Defense Security Cooperation Agency, 'Australia—Long Range Anti-Ship Missiles (LRASMs)', media release, US Government, 7 February 2020, [online](#).

<sup>32</sup> Email from Defence media, 23 July 2020.

<sup>33</sup> Scott Morrison, 'Nation's largest ever investment in cyber security', media release, 30 June 2020, [online](#).

<sup>34</sup> Linda Reynolds, 'New patrol boats to boost Navy capability', media release, 1 May 2020, [online](#).

<sup>35</sup> Email from Defence media, 21 July 2020.

<sup>36</sup> Senate Foreign Affairs, Defence and Trade Legislation Committee, *Estimates*, 20 February 2019, 29, [online](#).

<sup>37</sup> Christopher Pyne, 'Young Endeavour replacement', media release, 1 April 2019, [online](#).

<sup>38</sup> Linda Reynolds, 'Young Endeavour sets sail for 2020 youth program', media release, 15 January 2020, [online](#).

<sup>39</sup> I examined the implications of the announcement in 'Morrison's shipbuilding announcements are about more than jobs', *The Strategist*, 30 April 2019, [online](#).

<sup>40</sup> Email from Defence media, 20 July 2020.

<sup>41</sup> Email from Defence media, 24 July 2020.

<sup>42</sup> Email from Defence media, 24 July 2020.

<sup>43</sup> I've outlined the issues in *Thinking through submarine transition*, ASPI, Canberra, 2018, 37–39, [online](#).

<sup>44</sup> Email from Defence media, 16 July 2020.

<sup>45</sup> See Defence's submission to the Parliamentary Standing Committee on Public Works' inquiry into the Navy Capability Infrastructure Program, [online](#).

<sup>46</sup> See Congressional Research Service, *Hypersonic weapons: background and issues for Congress*, 17 March 2020, [online](#).

<sup>47</sup> Email from Defence media, 29 July 2020.

<sup>48</sup> See Marcus Hellyer, 'US to "pause" production of Australia's Triton drones', *The Strategist*, 27 February 2020, [online](#).

<sup>49</sup> Linda Reynolds, 'Australia commits to next generation Triton remotely piloted aircraft', media release, 18 June 2020, [online](#).

<sup>50</sup> Linda Reynolds, 'Cutting edge remotely piloted platform chosen in billion dollar project', media release, 28 November 2020, [online](#).

<sup>51</sup> For more detailed analysis of the FSP's Space domain, see Malcolm Davis, 'Towards a sovereign space capability for Australia's defence', *The Strategist*, 3 August 2020, [online](#).

<sup>52</sup> Defence provided the following explanation of space control: 'Space control encompasses activities that ensure Australia's access to space capabilities, the defeat of an adversary's efforts to interfere with or attack Australia's space capabilities, and the negation of an adversary's space capabilities. This definition is drawn from *Operational employment of space*, Australian defence doctrine publication 3.18, December 2016. Space domain awareness (SDA) is the foundation for space control. SDA is the effective identification, characterisation and understanding of any factor, passive or active, associated with the space domain that could affect space operations and thereby affect the safety, security, economy or environment of a nation. Through Joint Project 9360 – Space Domain Awareness, Defence is seeking to acquire sovereign SDA capabilities including space surveillance sensors and associated mission systems. Defence is in the process of investigating and developing options to further enhance ADF space control capability. The 'Space situational (domain) awareness' and 'Terrestrial operations in contested space' investment lines in Chart 5 will support ADF space control capabilities.' Email from Defence media, 6 August 2020.

<sup>53</sup> The land-based anti-ship missiles that entered the program in 2016 are still in the 2020 FSP, but are in the Maritime domain. It's not clear which service will operate them.

<sup>54</sup> For an alternative approach, see Marcus Hellyer, *Accelerating autonomy: autonomous systems and the Tiger helicopter replacement*, ASPI, Canberra, 2019, [online](#).

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- <sup>55</sup> In the light of the delays and project underspend to date, it appears unlikely that final operating capability will be achieved on schedule. Australian National Audit Office, *2018–19 major projects report*, ANAO report no. 19 2019–20, [online](#).
- <sup>56</sup> Australian National Audit Office, *Army’s protected mobility vehicle—light*, ANAO report no. 6 2018–19, 37, [online](#).
- <sup>57</sup> *Strategic vision: the future of Australia’s defence*, webinar, ASPI, Canberra, 2020, [online](#).
- <sup>58</sup> In an interesting symmetry, its sustainment spend has hovered around an inverted breakdown of two-thirds local, one-third overseas. Since the acquisition and sustainment spends are broadly similar, nearly half of Capability Acquisition and Sustainment Group’s total spend remains in Australia.
- <sup>59</sup> As a historical analogy, the high-strength hull plate steel Bisalloy provided for the Collins submarine program, was 0.65% of the total cost. Hans-J Ohff, ‘Caveat emptor’, Submarine Institute of Australia, [online](#).
- <sup>60</sup> According to the Australian Steel Institute (ASI), ‘approximately 5.3 million tonnes of steel are produced annually.’ ‘The Australian steel industry—our future depends on it’, ASI, 2020, [online](#).
- <sup>61</sup> The Treasury, Department of Finance, ‘2019 election costings’, Australian Government, 2019, [online](#).
- <sup>62</sup> Whether that assessment of the premium is accurate is the crux of the issue. However, since the RAND Corporation published its study of the Australian shipbuilding industry, which estimated that Australian had historically paid a 30–40% premium for domestic builds of naval vessels, the government and Defence haven’t released information on the premium being paid. However, should one think that the Department of Finance’s assumptions and costings are completely ludicrous, its exact numbers over the forward estimates were added to the Defence Department budget as supplementation in the 2019–20 PAES (page 19, Table 6), so they’re being used for real-world budgeting. Defence portfolio, PAES 2018–19, [online](#).
- <sup>63</sup> Email from Defence media, 8 July 2020.
- <sup>64</sup> Australian National Audit Office, *2018–19 major projects report*, ANAO report no. 19 2019–20, 241–252, [online](#).
- <sup>65</sup> Australian National Audit Office, *Defence’s management of the Mulwala Propellant Facility*, ANAO report no. 26 2015–16, [online](#).
- <sup>66</sup> Email from Defence media, 30 July 2020.
- <sup>67</sup> Defence provided ASPI with updated numbers to 30 June 2020 of \$172.5 million for the NGTF and \$249 million for the DIH.
- <sup>68</sup> Department of Defence, *More, together: Defence Science and Technology Strategy 2030*, Australian Government, no date, [online](#).
- <sup>69</sup> Email from Defence media, 30 July 2020. Defence also noted that ‘a range of technologies developed under the Capability Technology Demonstrator program, which transitioned into the Defence Innovation Hub in 2016, have been incorporated into capabilities acquired by Defence in recent years, and some Capability Technology Demonstrator technologies have progressed to commercialisation with export success.’ In other words, only activities that have been receiving for five years or more have progressed to commercialisation and actual capability.
- <sup>70</sup> Defence also provide ASPI the following additional information on the sovereign weapons manufacturing line: ‘Reliable access to Guided Weapons and Explosive Ordnance is a key element of the Australian Defence Force’s preparedness. This investment will expand existing munitions production to enhance the resilience of Defence’s ammunition supply and explore the potential of partnering with industry to expand domestic guided weapons and explosive ordnance production capability. While the design of weapons, or sub-components, is an important aspect (depending on the specific weapon being considered), this investment also provides significant opportunities in sectors essential to supporting an increased weapon inventory, such as test and evaluation, maintenance and repair.’ Email from Defence media, 6 August 2020.
- <sup>71</sup> Email from Defence media, 30 July 2020.
- <sup>72</sup> The ANAO’s report on the design and implementation of the defence export strategy is due for release in September 2020; that may provide some useful information.
- <sup>73</sup> Although the DSU and FSP are silent on the government’s previous goal of becoming a top 10 arms exporter, so that ambition may have been quietly shelved.
- <sup>74</sup> SIPRI doesn’t use a standard currency, but a unit it terms ‘trend indicator value’ defined in ‘Sources and methods’, SIPRI, Stockholm, [online](#).
- <sup>75</sup> Whether some of the destinations for these exports are ones Australia should be selling to is a separate matter.
- <sup>76</sup> The FSP makes it very clear on page 21 that these are out-turned dollars. Hopefully we won’t have a repeat of the confusion about whether the future submarine’s costs were constant or out-turned.
- <sup>77</sup> Linda Reynolds, ‘New patrol boats to boost Navy capability’, joint media release, 1 May 2020, [online](#).
- <sup>78</sup> Email from Defence media, 24 July 2020.
- <sup>79</sup> Marcus Hellyer, *The cost of Defence: ASPI Defence Budget Brief 2018-19*, ASPI, Canberra, 2018, Chapter 6, [online](#).
- <sup>80</sup> Email from Defence media, 21 July 2020.
- <sup>81</sup> Scott Morrison, ‘Address—Launch of the 2020 Defence Strategic Update,’ 1 July 2020, [online](#).