

A ‘copper-bottomed’ approach to transforming military support

Improving military equipment support could reduce the cost of achieving the UK’s 2035 target force generation from 3.5% to less than 3.2% of GDP.

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HMS Bedford pulled alongside Plymouth

Dockyard in April 1779 to have her hull sheathed in copper. Six weeks and £9,200 (just £1.5m in today’s money) later she was copper-bottomed, routine maintenance had also been completed, and she was back at readiness¹. Admiral Sir George Rodney’s fleet, led by Bedford, chased and captured four Spanish ships of the line at Cape St Vincent the next January. He attributed his success to the speed and prolonged readiness at sea of coppered vessels, and it was his advocacy after this engagement that

prompted the Admiralty to roll out coppering across the Navy. Roll forward 250 years, and greater military readiness through productive equipment support is what the UK’s armed forces need as we navigate the ‘Transition to War’ this decade.

The UK’s long history of developing and sustaining capability advantage through innovative equipment support spans the Napoleonic Wars, the World Wars and the Falklands War. The UK needs that edge again because the speed at which threats are developing is outpacing the increase in Defence funding. UK Defence Support productivity has fallen in the past decade driven by a combination of limited transparency on Support performance, complex Support contracts that rarely incentivise productivity, and constrained investment funding. More strain will be placed on Support as the Defence Investment Plan (DIP) capitalises new capabilities. A ‘copper bottomed’ transformation of Support will be built on granular insight on readiness and cost performance, and catalysed by targeted interventions to ‘redraw the boundary’ in the partnership between Industry and the MOD, with access to private sector capital where defence and financial returns permit. Done right, this could deliver the UK’s target military output by 2035 at below 3.2% of GDP, rather than 3.5%. In the current funding environment, Defence should seek every opportunity to spend better as well as spend more. Acting now on a ‘copper bottomed’



The Moonlight Battle off Cape St Vincent, 16 January 1780, by Richard Paton. Bedford led Rodney’s coppered ships of the line. National Maritime Museum, Greenwich (BHC0429); public domain.

¹Three Decks: British Third Rate Ship of the Line ‘Bedford’ 1775

transformation will create financial headroom, enabling the UK to exceed its 2035 target force generation if necessary for further deterrence.

ABOUT THE AUTHORS

GBM Support's co-founders bring more than 30 years of combined Defence experience.



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Co-founder, GBM Support

- 20+ years working on military Support productivity from Typhoon's entry to service, and across every domain in the UK
- Worked with Armed Forces in the US, Europe, Middle East and Australasia
- Former Group Chief Executive of HydraB, a UK-based industrial conglomerate focused on decarbonisation of heavy transport



Paul Morgan

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- Nearly two decades' experience working across the Defence industry
- Extensive track record across fixed wing, rotary wing and defence nuclear platforms, covering acquisition, support reconfiguration, operational transformation and transactions
- Broad private capital experience and network, with an extensive transactions track record

The call to arms

The Doomsday Clock, at 85 seconds to midnight, is later than it has ever been². In 2025, there were eight ongoing inter-state conflicts, the highest number since records began in 1946³. 99 countries became less peaceful in 2025, the sharpest decline since measurement began 20 years ago⁴. The Strategic Defence Review (SDR) and the subsequent DIP are clear that we are pivoting into a 'Transition to War' (TTW): *"we are on a path to warfighting readiness by 2030. We must be mission ready by 2030 against a peer adversary. That means investing in our armed forces. That mission is backed by our commitment to the largest sustained increase in defence spending since the end of the cold war"*⁵. The Government has laid out a multi-faceted strategy including (but not limited to) building morale and fixing recruitment, autonomy, land lethality, cyber, space, sovereign industrial capacity, nuclear, AI and quantum, all drawn together by a 'National Conversation' to ensure civic preparedness⁶.

²Bulletin of the Atomic Scientists, 2026 Doomsday Clock Statement, 27 January 2026

³Uppsala Conflict Data Program, June 2026

⁴Institute for Economics and Peace, Global Peace Index, p8

⁵Luke Pollard, Minister for Defence Readiness and Industry, House of Commons debate on Defence Readiness, 20 May 2026.

⁶MOD, The Defence Investment Plan, 30 June 2026, pp 9-12



British Army artillery live firing. Photo: Crown copyright (MOD).

This is a compelling agenda. But there are only three fiscal years after this one to the end of the decade. There has been plenty of visible political debate about whether the UK is spending quickly enough (others, like Poland and Germany, are faster⁷) or whether the UK is spending enough (2.7% of GDP by the time the UK has declared it must be ready to fight⁸). That debate focuses on the important new things the UK must be able to do to be a credible adversary in modern warfare. That focus, however, can obscure the reality that its current equipment is the substantial bulk of what the UK would be fighting with in 2030. The equipment asset base on the UK MOD's balance sheet is worth approximately £160b⁹. The planned cumulative capital growth through to 2030 is £19.5b¹⁰; even if all the growth was spent on new capability, it would still only represent roughly 15% of the UK's equipment stock.

The TTW requires not only that the UK invests in the new but also that it gets the most out of the old.

Increasing readiness by better use of Support spend will make the UK a more credible adversary. From the outside, the readiness picture is incomplete but there is widespread evidence of substantial shortfalls across multiple platforms. In 2009, just ahead of Type 45 Destroyer coming into service, the MOD explained to the Public Accounts Committee that despite cutting fleet size from 12 to 6 “it will be able to maintain four ships at sea, and while there is very high probability of maintaining five, there is a small risk it will not”.¹¹ In February 2022, when Russia invaded Ukraine, all were alongside. By December 2024, two were available.¹² In January 2026, three were available and the Power Improvement Project's first vessel took 20 months to complete versus a planned six, meaning it will be 2028 before the project is complete. The Hawk T2 fleet, part of the Military Flying Training School at

⁷Institute for Fiscal Studies, UK Defence Spending: composition, commitments and challenges, 26 September 2025, Figure 7.12

⁸MOD, The Defence Investment Plan, 30 June 2026, p7

⁹National Audit Office, Overview of the Ministry of Defence 2024-25, December 2025, p9

¹⁰MOD, The Defence Investment Plan, 30 June 2026, p14

¹¹House of Commons Public Accounts Committee, Ministry of Defence: Type 45 Destroyer, Thirtieth Report of Session 2008–09, HC 372, 1 June 2009, para 5, page 10

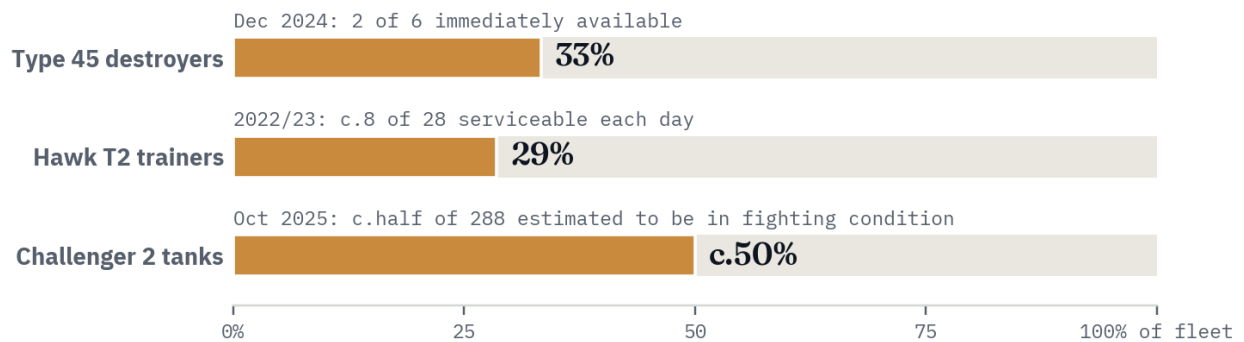
¹²House of Commons written answer 17486, 9 December 2024

RAF Valley, has long under-performed its target output. In 2022/23 the fleet’s 28 aircraft could sustain 18 sorties a day versus the target of 55¹³. Just 8 aircraft were serviceable due to an engine fault that has taken years to resolve; in March 2024, 12 aircraft were available prompting then Air Chief Marshal Sir Richard Knighton (currently Chief of the Defence Staff) to state that “we get about half of what we should get out of it”¹⁴. Land equipment fares no better. In March 2023, the Defence Select Committee was told that 157 of the 227 Challenger 2s were available or could be made available within 30 days.¹⁵ Of the remaining 70, 14 had been gifted to Ukraine and most of the rest, the minister suspected, had been cannibalised for parts. By 2025, it was estimated that roughly half of the Challenger 2 fleet was in fighting condition.¹⁶

EXHIBIT 1

Published snapshots point to large readiness gaps on major platforms

Share of fleet available at the latest published point, %



Source: Type 45: House of Commons written answer 17486, 9 December 2024. Hawk T2: House of Commons Defence Committee, Aviation Procurement: Winging it?, Tenth Report of Session 2022–23, paras 102–103. Challenger 2: Army Technology, 31 October 2025. GBM Support analysis

These examples give cause for concern, and yet there is evidence that transformational improvements in readiness can be delivered. An MOD press release in October 2026 celebrated the support contract with Airbus to maintain the Atlas fleet. The contract envisages a 30% increase in availability, from 10 daily available aircraft to 13¹⁷.

The opportunity suggested by the readiness data is not incremental; the three platforms above could increase readiness by 100% or more

Defence support’s productivity challenge

Ever since David faced Goliath it has been hard to assess military capability accurately. Could a boy’s sling really be more effective than a javelin, an even larger spear, a sword and heavy armour (worn by a

¹³ House of Commons Defence Committee, Aviation Procurement: Winging it?, Tenth Report of Session 2022–23, para 103
¹⁴ Air Chief Marshal Sir Richard Knighton, annual lecture to the Freeman Air and Space Institute, 26 November 2024
¹⁵ House of Commons Defence Committee, Oral evidence: Work of the Minister for the Armed Forces, HC 717, 8 March 2023, Qq 31–46
¹⁶ Army Technology, 31 October 2025
¹⁷ MOD press release, “30% boost to UK military transport aircraft availability”, 1 October 2026

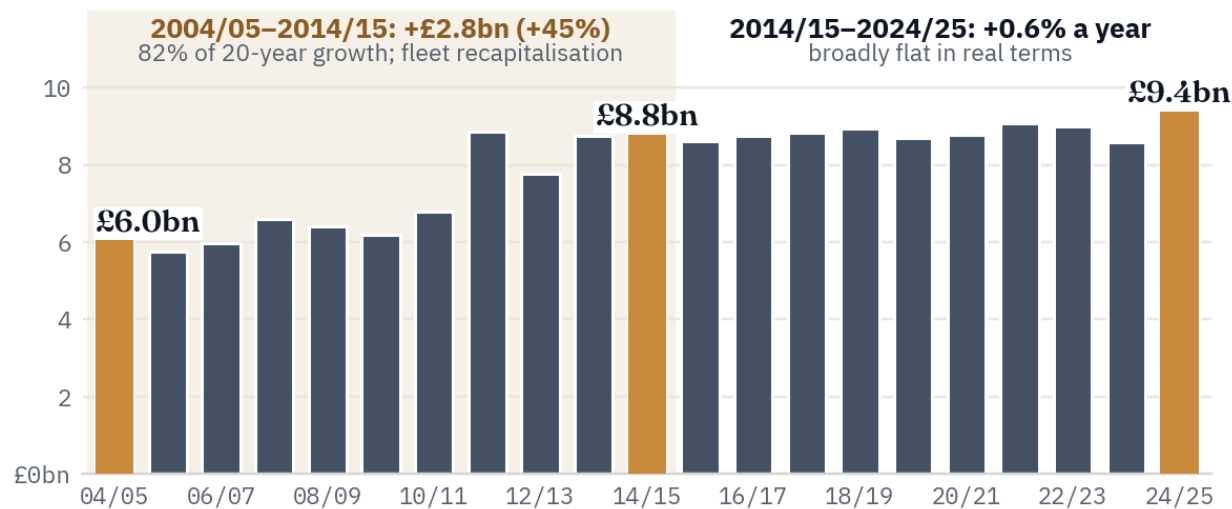
giant)? Without a clear measure of output, a quantitative perspective on productivity will be elusive. However, even with these caveats, there is enough directional evidence to suggest Defence Support productivity has deteriorated.

At £9.4b in FY2024/25, UK MOD Support spend was 16% of total Defence spend and 0.3% of GDP¹⁸. An initial look back over the prior twenty years suggests MOD did make progress in driving Support productivity in the last decade. From 2004/05, the Equipment Plan (EP) grew from 33% of total Defence spend to 47% by 2014/15 driven by a recapitalisation of the portfolio¹⁹. Platforms including Typhoon, T45, Atlas, several Astute boats and Mastiff all entered service in this period. 82% (£2.8b) of the growth in Support spend since 2004/05 came in the first decade. In the decade that followed, the EP remained flat as a percentage of total Defence spend (46% in 2024/25) while Support as a percentage of the EP declined from 40% to 34%²⁰. From 2014/15 to 2024/25, Support spend grew in constant 2024 prices by just 0.6% CAGR²¹. This suggests improvement.

EXHIBIT 2

Real-terms Support spend rose sharply to 2014/15, then flattened

MOD Equipment Support expenditure, £bn, constant 2024/25 prices



Source: MOD, Tables relating to departmental resources 2025, Worksheet 4; HMT GDP deflators; GBM Support analysis

There is clear evidence of Support innovation that decade which delivered meaningful impact. A notable example was the TyTan support contract for Typhoon. A joint team from the MOD, BAES and Leonardo reconfigured the support ecosystem, creating a single enterprise financially incentivised to deliver flying output. Flying hours increased more than 25% from ~16,500 per year to over 21,000 in 2022. Total cost reduced simultaneously by more than one third. The saving was recycled into capability upgrades that included Project Centurion and the integration of Meteor, Storm Shadow and Brimstone.²²

¹⁸MOD, Departmental Resources 2025, 16 January 2026, Worksheet 4; ONS Quarterly National Accounts, 30 June 2026; HMT GDP deflators

¹⁹Ibid

²⁰Ibid

²¹Ibid

²²BAE Systems, ‘Stepping up to Support’, 3 August 2023; Defence Equipment & Support, ‘Typhoon TyTAN – keeping the backbone of UK combat air defence airborne’, 29 January 2024

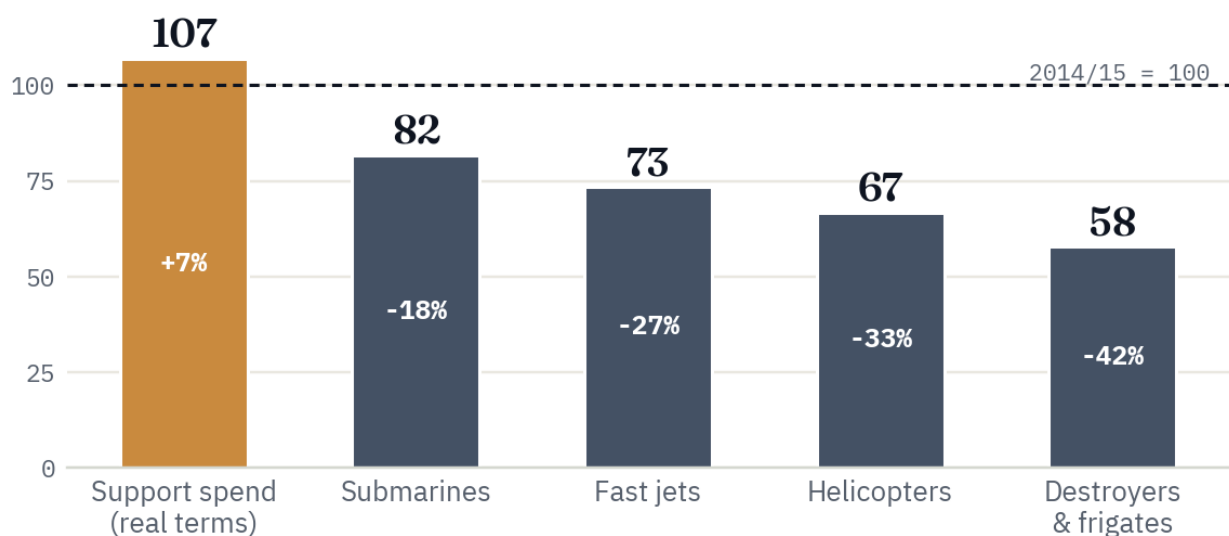
TyTan is an excellent demonstration that the ‘double whammy’ of increased output and reduced cost is possible in an MOD context.

But the TyTan model has not been consistently applied across the rest of the equipment portfolio and productivity overall seem to have gone backwards. Whilst Support spend remained broadly flat from 2014/15 to 2024/25, the corresponding platforms it related to declined significantly: compared to a decade earlier, there were ~20% fewer submarines, ~40% fewer Destroyers and Frigates, ~33% fewer helicopters and ~25% fewer fast jets.²³

EXHIBIT 3

Support spend held steady while the fleets it sustains shrank

Index, 2014/15 = 100; 2024/25 (fleets at latest published position)



Source: MOD, UK Armed Forces Equipment and Formations 2016 and 2026; UK Defence in Numbers 2015; MOD, Tables relating to departmental resources 2025; GBM Support analysis

Of course, the UK's equipment has become more sophisticated in that time. This might imply that it would become more expensive to support. There is no quantitative way of demonstrating this, largely because there is no official or widely accepted measure of military 'power'. Perhaps the best is the Global Firepower Index, which shows the UK declining in power both relatively (from 5th in 2015 to 8th in 2026) and in absolute terms (the Power Index worsens from 0.1443 in 2024 to 0.1881 in 2026). With Support spend essentially flat in this period that suggests a directional decline in productivity.

Another way of framing the UK's Support productivity over the last decade is to consider what equipment remained in service throughout the last decade, what was replaced and how much more capable was the replacement than its predecessor. A snapshot across 38 platforms, across land, sea and air, suggests that UK Support productivity will have declined in the last decade, in spend per unit of 'power' terms, unless new platforms were greater than 2.2x more capable than their predecessor.

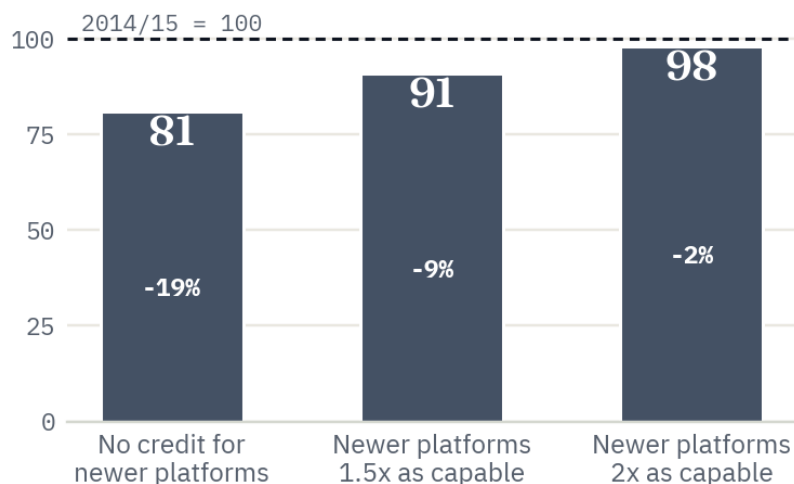
²³MOD, Armed Forces Equipment and Formations 2026 (supplementary tables); MOD Armed Forces Equipment and Formations 2016

EXHIBIT 4

Unless new platforms are more than twice as capable as those they replaced, Support productivity has fallen

Capability-weighted platform index per £ of real-terms Support spend, 2024/25 vs 2014/15, across 38 platform types

Capability per £ of Support, 2024/25



Source: GBM Support capability-weighted platform index; MOD equipment and expenditure statistics

2.2x
how much more capable
new platforms must be for
Support productivity
to have held steady

Transforming Defence Support

TyTan and other examples show that Support transformation in Defence is possible. But it is not easy. The UK is also not the only country to struggle with readiness and the cost of legacy support. Defence Ministries have not been trying to be unproductive and many of them share the same three issues:

1. *A lack of transparency around contract performance.* Too often, fundamental data points like readiness, availability, task completion, turn-around times in maintenance, cost and schedule adherence are not aggregated, displayed in a visible intuitive way and used to drive action.
2. *Support cost often remains secondary* as platforms and providers are selected through the acquisition process. Apparently harmless trade-offs on support arrangements that help get acquisitions 'over the line' store up pain for later. Once in service, delivering the output becomes the excuse for not compressing cost rather than the boundary condition within which cost must be minimised.
3. *Lack of nuance in contract design* hampers delivery of productivity, whether that is understanding how to balance risk transfer with accountability, appropriate application of commercial rules without dampening creativity, management of annularity or thinking about the best way to incorporate private capital and returns in support solutions.



Riggers inspect bullet damage to a Bristol Blenheim of No. 110 Squadron under repair at Wattisham, Suffolk, 1939–41. Photo: B J Daventry, RAF official photographer; Imperial War Museum (CH 372); public domain.

But it can be done. And the UK has done it before during a transition to war. The Civilian Repair Organisation (CRO), founded in September 1939, created a network of private sector businesses to repair aircraft as we fought the Battle of Britain. By July 1940, output of repaired aircraft was up 186% and engines by 159%²⁴. The bottleneck on RAF capacity in 1940 was pilots rather than aircraft; despite heavy losses the RAF had more aircraft in November than it had in July 1940. By the end of the war, it was estimated that more than a third of the RAF's heavy aircraft had been through the CRO. In parallel, Cecil Gordon and C H Waddington were

innovating the maintenance and overhaul policies to maximise flying hours from existing fleets. They were able to increase flying hours by more than 60% without adding aircraft or people²⁵. Similar levels of improvement were identified, delivered but then not sustained at RAF Valley almost a decade ago prior to the engine reliability issues.

It is clear that Defence ministries face multiple challenges in improving Support productivity. Yet it has been done before both historically and recently on current equipment. There is no single recipe for success but we consistently see three common catalysts that help unleash Support's potential. A 'copper bottomed' support transformation should be built around three activities:

EXHIBIT 5

A copper-bottomed Support transformation rests on three activities

01 Insight Know how every support contract performs against output and cost – and what it should cost	02 Intervention Prioritise and act within existing contracts, by capability cluster or by industrial partner	03 Investment Bring in private capital where Defence outcomes and financial returns align
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Source: GBM Support

- 1. Insight** – it sounds simple, but Defence Ministries must have a comprehensive, data based perspective on how each support contract is performing against its output and cost targets. Authorities should know what the maximum potential capacity is from their equipment and people. They should also know what the minimum compressible support cost is for their platform, and what the availability impact is of each lever (i.e., a marginal availability cost curve).
- 2. Intervention** – based on insight developed above, Ministries should determine where to prioritise their interventions. Timing does not need to be limited by contract renegotiation windows;

²⁴James Holland, The Blitzkrieg of Lord Beaverbrook, james1940.substack.com, 17 February 2025

²⁵C.H. Waddington, OR in World War 2: Operational Research against the U-boat, 1973

substantial productivity improvements can typically be delivered within a contract's existing KPIs and obligations. Sometimes it can be right to address a capability cluster (e.g., deep strike) together. Sometimes it can be better to take a single industrial partner and work with them across their full portfolio with you. Ministries should consider the right way to bundle Support activity into commercial packages. Sometimes it will be right to aggregate in order to help transfer delivery risk to Industry. Other times there may be faster, lower cost ways to deliver particular parts of a solution that could be split out from the main service. Ministries should always seek to understand the cost and service implications of multiple support configurations to help identify the right trade-offs and to support effective negotiation.

- 3. Investment** – despite committed increases, available capital is tight within MOD and across Government. There is substantial private capital looking to invest in Defence. Authorities should consider where such injections can deliver both meaningful improvements in Defence outcomes as well as return on the investment for the capital provider. Importantly, private capital participation often brings greater focus on financial and operational performance that can outweigh the incremental cost of capital versus Government funding. Careful structuring will be needed to allow Defence Ministries to participate in the financial upside that private capital can deliver, whilst adhering to requirements of Treasuries.

The prize

NATO countries are focused on Defence spend as a percentage of GDP. It's a proxy both for a country's commitment to Defence in a volatile world as well as the growth in capability as spend increases. What matters, of course, is the actual force a country is able to mobilise and project. A 'Copper Bottomed' Support transformation can make a significant contribution to the UK's military power.

The UK could deliver its target 2035 force generation by spending less than 3.2% of GDP rather than 3.5%

The approach below is a way of thinking about Support's contribution to the UK's TTW. It is directionally useful and will be rough order of magnitude accurate. The methodology can be challenged, particularly by those who have the actual numbers needed to make it more precise. But even without this nuance, the analysis makes a compelling case that Support transformation is a meaningful lever that the UK must pursue.

We draw on MOD's military equipment balance sheet as a proxy for power. Today it is worth ~£200bn²⁶. If the UK hits 3.5% of GDP on Defence Spend by 2035 then this balance sheet value is forecast to grow to ~£320bn. If we assume that readiness in 2035 is, on average, 60% then that implies we are looking to generate ~£195bn worth of military power. A 'Copper Bottomed' transformation of Support that succeeded in increasing readiness to 70%, would reduce the 2035 balance sheet demand to ~£275bn. In simple terms, if we extract a little more availability out of our Defence equipment, we can

²⁶ Includes plant, property and equipment as well as intangible assets

significantly moderate the amount we buy. Add to that the efficiencies that the Support transformation would deliver and the UK would need to spend less again to deliver the target power. The UK could deliver 3.5% of GDP's worth of power whilst spending less than 3.2% of GDP.

There is colossal potential for Support to contribute to the TTW. It is not easy but MOD has done it before. It is time to launch a 'Copper Bottomed' transformation of UK Support.

To learn more about why Support transformation is necessary for TTW and to explore how to mobilise, contact us at www.gbmsupport.co.uk