



National Audit Office

**REPORT BY THE
COMPTROLLER AND
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Ministry of Defence

The cost-effective delivery of an
armoured vehicle capability

Summary

- 1** Armoured vehicles comprise a range of military platforms including tanks, reconnaissance, engineer and personnel carrying vehicles. They permit military forces to manoeuvre while offering protection from a wide range of threats, and additionally provide platforms for mounting weapons and other military systems. Armoured vehicles are therefore a critical asset when undertaking a wide range of military tasks, from delivering humanitarian aid through to high intensity war-fighting operations.
- 2** To acquire armoured vehicles, the Ministry of Defence (the Department) has utilised two acquisition processes to procure all military equipment:

 - For its 'core' equipment, intended to generate the defence capabilities required to carry out the military tasks set out by high level Defence Policy, the Department uses its **standard acquisition process**. This is a comprehensive approach which includes all elements that combine to create military capability, including personnel, training and logistics support. The process also addresses equipment interoperability, which ensures that the various sub-components, such as radios and sensors, operate as expected when integrated into the same equipment. It also covers how the equipment itself operates alongside other vehicles, aircraft, and systems to ensure it can work effectively as part of a wider military force.
 - For additional equipment – or to modify existing equipment – required in response to conditions on specific operations, not catered for by the standard acquisition process, the Department can use the **Urgent Operational Requirements process**. This process can deliver equipment rapidly for specific operations, such as Afghanistan. However, the speed at which Urgent Operational Requirements are delivered means this equipment is often introduced before full support in terms of trained personnel and logistics can be put into place and with limited time to consider full interoperability. Such equipment is often specific to a particular need and may not necessarily be as suitable across the whole range of military tasks as equipment purchased through the standard acquisition process.
- 3** In the period since the 1998 Strategic Defence Review, a number of significant armoured vehicle projects procured through the Department's standard acquisition process have not been brought to fruition. **Figure 1** provides details of a number of these projects where no vehicles have been delivered despite spending £321 million on projects that have been cancelled or suspended. The Department has spent a further £397 million funding on-going, but delayed, projects that are not currently planning to deliver any vehicles before 2013. Since 2003, the Department has also spent approximately £2.8 billion buying and upgrading vehicles, using the Urgent Operational Requirements process, for operations in Iraq and Afghanistan.

Figure 1

Overview of armoured vehicle projects and Urgent Operational Requirements in the period since the 1998 Strategic Defence Review

Project	Date project commenced	Status and Expected In-Service Date	Number to be procured	Sunk Cost (£m)	Forecast cost remaining (£m)
Projects cancelled, suspended or delayed in the period					
Tactical Reconnaissance Armoured Combat Equipment Requirement (TRACER)	May 1992	Cancelled: Oct 2001	335	131	–
Multi-Role Armoured Vehicle (MRAV)	Mar 1998	Cancelled: Jul 2003	775	57	–
Future Rapid Effect System – Utility Vehicle (FRES UV)	May 2004	Suspended: Dec 2008 ²	~3000 ³	133	–
Future Rapid Effect System – Specialist Vehicle (FRES SV)	June 2008	Delayed: In-service from 2017	~1300 ³	142	7,586
Warrior Capability Sustainment Programme (CSP)	June 2009	Delayed: In-service from 2017	550+	38	1,418
Terrier armoured engineer vehicle	July 2002	Delayed: In-service from 2013	60	217	101
Subtotal				718	9,105
Projects delivered in the period					
Viking All Terrain Vehicle (Protected) ⁴	June 1997	In-service April 2006	100+	60	–
Titan and Trojan armoured engineer vehicles	May 1996	In-service Oct 2006	66	347	–
Subtotal				407	–
Total expenditure on armoured vehicles				1,125	9,105
Urgent Operational Requirements spending on vehicles				2,813	N/A

NOTES

- 1 Costs shown are for procurement only and exclude in-service support costs.
- 2 The current planned in-service date for the Future Rapid Effect System – Utility Vehicle (FRES UV) is 2022.
- 3 The FRES UV figure represents the total number of FRES vehicles which were expected to be bought. This would therefore have included the ~1300 FRES SV vehicles currently planned.
- 4 Costs shown for Viking exclude the purchase of additional vehicles under the Urgent Operational Requirements process.
- 5 Costs shown were reported as at: TRACER – 2002, MRAV – 2003, FRES UV & SV – November 2010, Terrier – March 2011 and Warrior – December 2010.

Source: National Audit Office analysis of Departmental data

4 The list of armoured vehicles projects cancelled, suspended or delayed in Figure 1 suggests that – given the expenditure of over £1.1 billion since 1998 without the delivery of its principal armoured vehicles – the Department’s standard acquisition process for armoured vehicles has not been working. This report considers what factors have contributed to the current situation through a review of the way in which the Department has approached the acquisition of armoured vehicles using both its standard and Urgent Operational Requirements processes. In particular, it considers the following aspects:

- **Part One: Defence policy and the role of armoured vehicles** – The stated Defence policy of the United Kingdom regarding the use of Armed Forces, and the role of armoured vehicles in helping to deliver these objectives.
- **Part Two: Acquisition strategy and requirements setting** – Examining the strategy for acquiring armoured vehicles and the detailed performance requirements drawn up by the Department.
- **Part Three: Resource management** – The means by which the Department makes resources available to support implementation of its policies, including procuring armoured vehicles.

5 The detailed consequences of the failure to deliver armoured vehicles are set out in **Part Four** of this report.

Key findings

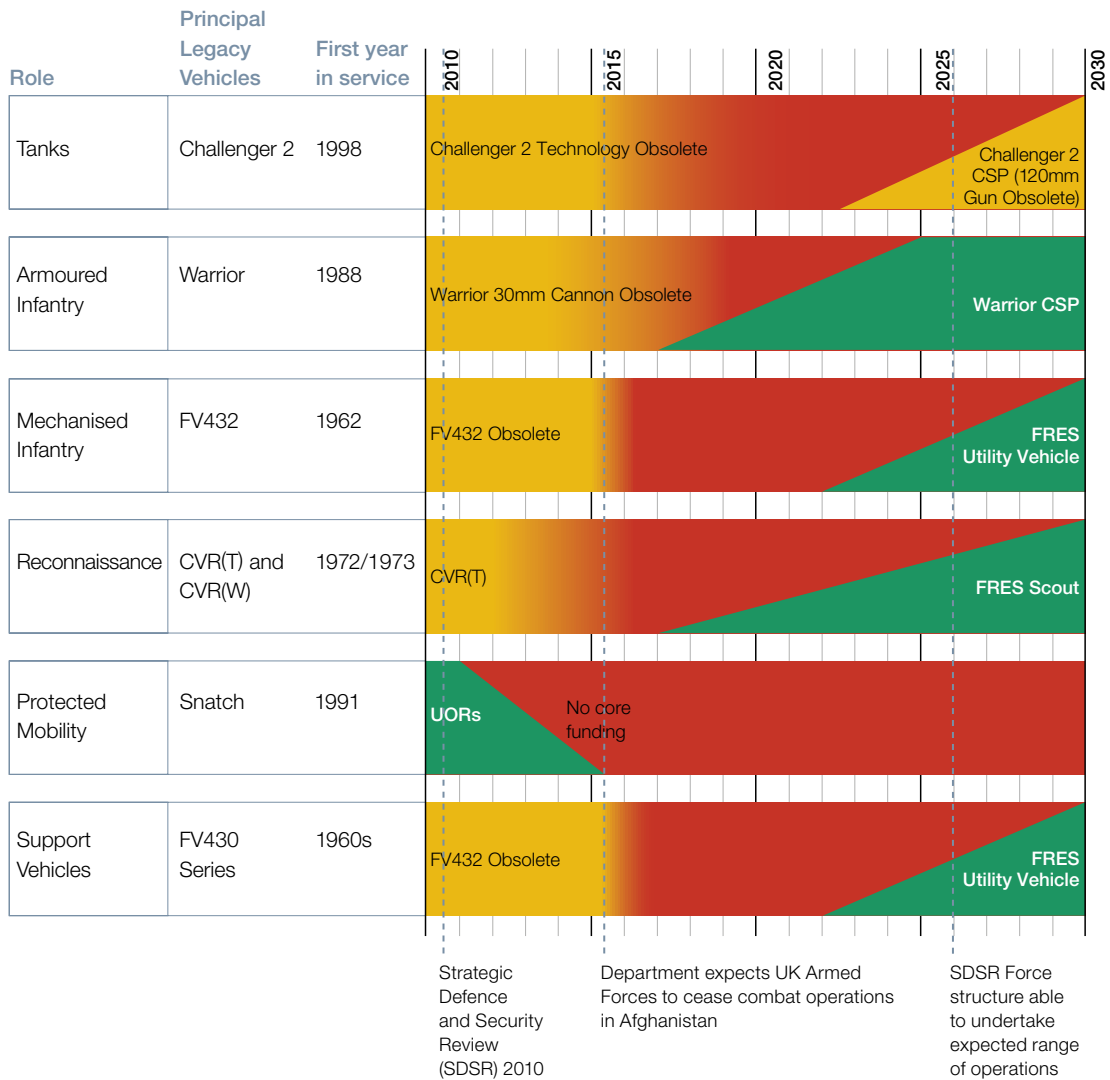
On Defence policy and the role of armoured vehicles

6 The failure to deliver key armoured vehicle programmes under the standard acquisition process will delay the implementation of the Department’s policy for sufficiently capable, flexible, mobile land forces. The delays which have arisen from cancelled or suspended armoured vehicle projects will result in the Armed Forces not being fully equipped with the vehicles identified as top priorities in the 2010 Strategic Defence and Security Review, until at least 2024-25 (**Figure 2**).

On acquisition strategy and requirements setting

7 The Department’s reluctance to compromise in setting technologically demanding requirements under its standard acquisition process has put the timely and cost-effective delivery of equipment at risk. Complex requirements have been set which rely on technological advances to achieve a qualitative advantage over the most demanding potential adversaries. However, for vehicles procured using the standard acquisition process there has not been an effective means to assess the costs, risks and amount of equipment needed to meet these requirements in the early stages. These demanding requirements often reduce the scope to maximise competition which in turn can lead to cost increases, delays to the introduction of equipment into service and reductions to the numbers of vehicles bought to stay within budgets.

Figure 2
Armoured Vehicle forecast capability 2010-2030



■ Fully meets requirements
 ■ Partially meets requirements
 ■ Doesn't meet requirements

■ Increasing obsolescence of existing fleet
 ■ Gradual introduction of new vehicles

CSP Capability Sustainment Programme CVR(T) Combat Vehicle Reconnaissance (Tracked)
 FRES Future Rapid Effect System CVR(W) Combat Vehicle Reconnaissance (Wheeled)
 UORs Urgent Operational Requirements

Source: National Audit Office analysis of Department data

8 Faced with rapid changes to equipment requirements driven by operational experience, these unwieldy processes have contributed to a number of armoured vehicle projects being delayed or abandoned. This has led the Department to place greater reliance on the Urgent Operational Requirements process to provide equipment for recent operations in Iraq and Afghanistan.

9 The Department has shown that it can make effective compromises to rapidly buy equipment specifically for operations. Urgent Operational Requirements are based on the principle that equipment only has to satisfy the current operational need – and be better than what is currently in service – to deliver equipment to the front line quickly; this generates realistic and deliverable requirements. The Department's recent progress on the FRES reconnaissance variant and Foxhound project has reflected this principle. This in particular should enable rapid deployment of the latter into Afghanistan.

10 The Urgent Operational Requirements process is not a substitute for the standard acquisition process, but lessons can be applied from the former to accelerate delivery of equipment through the latter process. The rapid delivery of Urgent Operational Requirements is necessarily often at the expense of fully developed support and training solutions which cause longer-term problems. The equipment is usually tailored to one particular military operation which can make it unsuitable to meet a wider range of military tasks.

On resource management

11 The Department's poor resource management has destabilised the standard acquisition process. As we reported in our *Strategic Financial Management of the Defence Budget* report, the cycle of unrealistic planning followed by cost overruns has led to a need to regularly find additional short-term savings. Areas of the Defence budget where there have been lower levels of long-term contractual commitment, such as armoured vehicles, have borne the consequences of decisions to fund large scale and long-term projects in other sectors.

12 The Department's requirement to identify significant savings in order to live within its means has led to equipment gaps appearing in some areas, such as armoured vehicles. While the decision to make savings in these areas may have been founded on an evaluation of short-term priorities, the deferral of successive programmes has created a shortfall against the Department's policy goals for Land Forces in the longer term.

13 Urgent Operational Requirements have been used to address shortfalls in equipment for current operations. As the purchase costs of equipment bought through the Urgent Operational Requirements process are normally fully funded by the Treasury, outside of the Defence Budget, these procurements are not affected by the destabilising effects of short-term savings. Consequently, they can, to some extent, be seen to partly compensate for the consequences of delays in procuring equipment through the standard acquisition process.

On the consequences of the issues identified with the Department's standard acquisition approach and resource planning for armoured vehicles.

14 In the period since 1998, the Department's standard acquisition approach has failed to deliver armoured vehicle projects on a consistent basis in line with plans. While the Department has delivered a number of smaller projects worth £407 million, it has spent £718 million on projects that have yet to deliver, some of which have been cancelled or suspended indefinitely. In practice, however, this is a relatively small fraction of the £14 billion the Department intended to spend on the Future Rapid Effect System project alone. The result is that the Armed Forces have not received much of the equipment they expected to have over the last decade.

15 The Department spent over £2.8 billion in the same period on upgrading and buying new vehicles through the Urgent Operational Requirements process. While much of this expenditure would probably have been necessary due to the specific nature of the threats faced in Iraq and Afghanistan, it would have been lower had more armoured vehicle projects from the Department's core programme been delivered as originally planned.

16 Based on current resource plans, the Department will have a gap between the armoured vehicles it says it needs now and those it will have at least until 2025, although this gap will start to decrease from 2017 as new vehicles begin to enter service. While the Department expects to bring some of the Urgent Operational Requirements vehicles into its core fleet, there will still be significant shortfalls in the equipment needed to undertake the full spectrum of potential future military operations. Without both significant additional investment and a greater focus on maintaining the level of investment in armoured vehicles currently planned, the Department's ability to carry out the range of tasks expected of it is likely to be reduced.

Conclusion on value for money

17 Despite the commitment of considerable resources over more than a decade the Department still faces significant shortfalls against its plans to equip its Armed Forces with more mobile and flexible forces and is likely to continue to do so until at least 2025. The Department's standard acquisition process is undermined by a combination of over-ambitious requirements and unstable financial planning. While we acknowledge events in Iraq and Afghanistan have required changes to the Department's original plans and the purchase of specialist vehicles, we do not assess that its approach over the last decade to renewing its core armoured vehicle fleet represents value for money.

18 The Department's approach to the purchase of specialised vehicles under the Urgent Operational Requirements process has been more successful. A total of £2.8 billion has been spent to date. The Armed Forces are now better equipped with vehicles suitable for current operations in Afghanistan with significantly improved protection levels against today's threats. While it is expected that some of these vehicles will be brought into the core fleet following the end of operations in Afghanistan, they are not suitable for the full range of potential military tasks. Consequently, further expenditure will be needed to recover and refurbish these vehicles and to provide a long-term solution. The Taxpayer can only have confidence that future investment plans will deliver value for money if they are made on the basis of stable and sustainable budgets however.

Recommendations

19 In future, the Department must exhibit greater pragmatism in its acquisition of armoured vehicles to ensure that some of the lessons learned from buying Urgent Operational Requirements are embedded into core projects. Specifically, it must make realistic compromises between performance, time and cost at an earlier stage. We therefore make the following recommendations:

- a** **Repeated cancellations, suspensions and delays of armoured vehicles projects indicate that the current standard acquisition process has been unsuccessful.** The Department has told us that it intends to put in place a medium-term strategy for the armoured vehicle sector. If so, this strategy should be consistent with Defence policy goals; consider other acquisition strategies for delivering armoured vehicles; and ensure sustained investment in the sector provides sufficient capability to respond to future military requirements.
- b** **The Department has repeatedly destabilised acquisition activity through poor resource management.** It should ensure greater coherence between Defence plans and resources over longer periods. Where gaps in the structure and capabilities of the Armed Forces arise as a consequence of resource management decisions, those should be reported to Parliament in its annual performance report.

- c** The requirements the Department has sought from armoured vehicles procured through the standard acquisition process have been demanding, and frequently depended on integrating advanced, but immature, technologies from the design stage. Where there is no clear and compelling requirement for these technologies to be integrated during vehicle design, the Department should have a default position of purchasing off-the-shelf equipment which can be incrementally upgraded in the future, if necessary.
- d** The Department has learnt lessons from previous armoured vehicle acquisition projects, but more can be done. The Department has learnt lessons from both the Urgent Operational Requirements and standard acquisition processes, and applied these to current armoured vehicle projects. Firm delivery deadlines and budgets could further ensure realism in setting requirements. This could be achieved by engaging more closely with industry to assess vehicle requirements, based on mature technology, that are initially sufficient – and better than vehicles already in service – but having the potential for future development. The Department should consider buying vehicles in batches, with each subsequent batch offering improved capabilities within a lower initial budget approval, but based on a common vehicle design to minimise any differences in logistic support and training requirements.
- e** The Department has chosen international competition as its preferred route for acquiring armoured vehicles, whilst retaining some specific capabilities on-shore. We support the principle of competition as a means of acquiring armoured vehicles, and this can effectively be achieved by accepting requirements based on minimum modification to existing vehicle designs. By procuring vehicles in successively more capable batches, and modifying them over the vehicles life, the United Kingdom can retain key technologies and the ability to design, manufacture and overhaul vehicles at levels the Department deems critical to hold on-shore.