

The Two Questions the Commission Needs to Answer

Testimony before the National Commission on the Future of the Army

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I have been asked to speak on the subject of Army equipping and modernization. Given the subject it is tempting to dive right down to a discussion of the new and clever gadgets and widgets the Army should acquire, regaling you with descriptions of laser-equipped tanks, fully autonomous air and land platforms or miracle metals that weigh nothing and cost a pittance but provide protection better than that of depleted uranium. It would be fun but it would also be fantasy.

Instead, I want to start at the other end of the story to address the factors that are shaping the Army's ability both to maintain its desired portfolio of weapons systems and platforms and to pursue critical modernization requirements. In truth, the future of Army modernization is already largely determined, a function of factors over which the Army itself has little control. These include:

- Federal budget/resources available for defense. The combination of slow economic growth over the medium-term, the inevitable rise in interest rates and the demands of entitlements make it easy to predict that the future will be characterized by defense budgets that, at best, will be rising only slowly. When inflation is taken into account they will be essentially flat. It is more likely that defense budgets will decline in real terms.
- The structure of the defense budget. DoD's acquisition budgets are in danger of being crushed by the "jaws of death." The upper jaw is formed by high and growing costs and long-term schedules associated with major acquisition programs. Research over the past several years, some of the best of which was sponsored by Acquisition, Technology and Logistics, makes it clear that all efforts at acquisition reform have had very little impact on the problems of cost and schedule. Large, complex programs incorporating new technologies will cost a lot and take a decade or more to reach IOC. The massive lower jaw is formed by must-pay Operations and Support (O&S) bills that are, in turn, a function of end-strength, readiness requirements and the mass of equipment that must be maintained. The cost of personnel and sustainment is rising too. As a result, residual procurement resources will inevitably be squeezed.
- The dearth of major new programs. The Army is out of phase with the other Services. It just completed an upgrade cycle associated with responding to the demands of the ongoing conflicts and several large, complex and expensive programs that ultimately were unsuccessful. By comparison, the other Services have a set of well-defined procurement programs, including multi-year and block buy contracts, which will be difficult to change. In the competition for increasingly scarce procurement dollars, it is difficult to imagine that the Ohio Replacement, the Ford-class nuclear-powered aircraft

carrier, Long-Range Strike, F-35 and KC-46 tanker will not have first claim on available resources.

- The weight of the installed base of equipment and platforms. The Army today possesses a very large installed base of equipment and platforms. When the Army bought nearly a million sets of thermal underwear for forces deploying to Afghanistan, the unit price was low but the total cost nearly made it a major acquisition program. Humvees will constitute around two-thirds of the light tactical vehicle fleet until 2050. The first and obvious challenge is to maintain large inventories and fleets of weapons systems and platforms. But the equally challenging but less recognized problem is that any modification or product improvement to one or more of these fleets rapidly adds up to big money.
- The character and limits of the training base. The Army has always struggled to maintain a balance between the Operating and Generating Forces. This extends to the training base. Well trained personnel has been a major, enduring U.S. military advantage for decades. The Army needs to train as it will fight. The Army has the largest, most diverse, technologically sophisticated and distributed training bases of any military organization in the world. But its throughput is constrained and much of its technology is aging, requiring continuous maintenance or demanding modernization. Moreover, the range of potential contingencies for which forces must be prepared makes it difficult to define a peacetime training regime and schedule at the level of Brigade Combat Teams (BCT) and above.
- The uncertain arrival of advanced technology. The Army's decision to push invention, as it calls the introduction of advanced systems incorporating new technologies, as far into the future as possible, is certainly a function of budget factors. But it is also a reflection of the reality that most of what the Army desires in the ways of enhanced lethality, protection, mobility and sustainability depends on technological breakthroughs that are not predictable with respect to timing or cost-effectiveness. Moreover, it is by no means clear that simply replacing the existing fleets of combat vehicles with variants that essentially are the same and would do the same job but be smaller, lighter and cheaper is the right answer to the challenges of combat two and three decades hence. It is to be hoped that the Army will take such time as is available to it in the near and mid-term to experiment not just with capabilities but organization, tactics and operations so as to inform the long-term pursuit of so-called breakthrough capabilities.
- The state of the defense industrial base. The Army's mantra of innovate, improve and invent has significant implications for the future of the industrial base. From the perspective of the private sector, there is little to look forward to in innovation and improvements both of which imply low cost initiatives and limited production runs. Maintenance of existing equipment and platforms generates revenues but does not support or encourage the retention of design skills or production capabilities. Recent acquisition reform policies such as Lowest Price Technically Acceptable contracting and more frequent competitions have further dimmed the prospects for the private companies. It is unclear what the rewards are for taking risks, particularly if corporate resources are involved.

- Finally, people and demographics. People are the Army's most important asset. I am including under this heading everyone in the Total Force plus government civilians and private contractors. That said, there sure are a lot of them and they are very expensive. Add to the cost per full time equivalent the fraction of the total available manpower pool that are non-deployable or require extensive pre and post mobilization training and support, and the total cost per deployed individual is astronomical.

I want to briefly mention demographics because it bears on both the Army's budget challenges, but also on how it might invest in future capabilities. According to a recent Pentagon study, fully 71 percent of 17-to-24-year-olds in the U.S. would not qualify for military service because of reasons related to health, physical appearance and educational background. According to the head of Army Recruiting Command, "the quality of people willing to serve has been declining rapidly."¹ There are two conclusions to be drawn from this data: the Army needs to cut its appetite for people by all means possible and figure out how to use fewer people through different organizational schema and increased automation.

Given the overly constrained environment in which it is operating, the Army has chosen a prudent course. It is eschewing major new starts, focusing in the very near-term on what it calls innovations to existing platforms, moving from there to investing in major upgrades in the medium-term and pursuing breakthrough capabilities over the long-term through a focused and well thought out Science and Technology (S&T) program. In addition, the current plan is to field many of the identified capability enhancements – Stryker Double V Hull and 30mm turret and ultralight vehicles, etc. – slowly or in limited numbers.

The Army also has acted rather aggressively to divest itself of obsolescent and costly to maintain systems. The trouble is that it still has an iron mountain of weapons systems, platforms and hardware that at least must be maintained and, preferably, upgraded.

More important for the topic of modernization, the Army is evolving how it formulates requirements and pursues acquisitions. In particular, I want to point to the trend of allowing commanders in the field to drive the processes through the generation of operational needs statements. This reflects the experiences of the past decade in which hundreds of items were procured, everything from cold weather gear to robots, unmanned aerial systems (UASs), aerostats, sensors and armored vehicles, through an accelerated acquisition process based on operational requirements generated in the field. Current examples: ultralight vehicles, Mobile Protected Firepower vehicle, 30mm for Stryker and the Advanced Precision Kill Weapons System.

This approach will not work for everything, most notably major new weapons systems and combat vehicles. But it is particularly relevant and useful at this stage in the Army's evolution where there is little money for new starts, transformational technologies are fairly far out on the horizon and there is substantial uncertainty regarding where the Army will be deployed and how it will be required to fight. By focusing on the operational needs generated by field commanders the Army can promote relevance, shorten acquisition timelines, constrain costs, limit the

¹ Nolan Feeney, "Pentagon: 7 in 10 Youths would fail to qualify for military service," Time, June 29, 2014

potential for mischief by a distant acquisition bureaucracy and, perhaps most important, gets new capabilities in the hands of operators to see if they work. This takes the idea of prototyping, a focus of the acquisition reform proposals laid out in the FY2016 National Defense Acquisition Act, in an interesting direction.

In addition, the Army has figured out how to use experimentation, notably the Network Integration Evaluations (NIEs), to test and assess hardware and systems. An example is the so-called Capability Set 13, a mix of new and tried but capable equipment that will be provided to deploying BCTs. The creation of the Army Warfighting Assessments in lieu of one of the twice a year NIEs, will provide the Service with another useful venue for realistic experimentation involving new capabilities and concepts.

The demand pull generated by field commanders through the Operational Needs Statement (ONS) process can be matched by a focused supply push provided by Training and Doctrine Command, the Centers of Excellence and Army Materiel Command and its subordinates. These organizations should look across theaters, commands, conflicts and adversaries to identify significant near-term, real world capability gaps that should be addressed. These gaps reflect not only our own experiences but those of friends and allies in Europe and the Middle East. I would propose 6 gaps with significant near-term consequences that require near-term solutions:

- Active protection. The growing lethality of hostile anti-armor/anti-vehicle systems has intersected with the physical limits of passive protection. The need to equip, at a minimum, forward deployed and early arriving units, with active protection is beyond question.
- Defense against rockets, artillery and mortars (RAM) and UASs. The threat encompasses artillery and rocket systems that outrange our own, advanced warheads, improved remote targeting and precision guidance and massed fires of cheap rockets. To these must be added the very real possibility that for the first time in decades, U.S. ground forces may be subject to hostile air attacks. While the Pentagon keeps talking about ways of operating “left of bang,” the reality is that it is likely to have to absorb the first shot. The Army needs a mobile, low cost defense against rockets, artillery mortars and UASs now.
- Enhanced Indirect Fires. The Army can no longer tolerate being outranged and outmassed by hostile indirect fires. Moreover, in an era of increasingly contested airspaces, the value of readily available, land-based indirect fires will increase. The Army needs to invest in more and better munitions for all types of BCTs.
- Offensive and defensive electronic warfare (EW). While cyber is usually and correctly married up to EW in discussions of emerging capabilities and concepts, I want to focus on the latter. The Army needs to develop workarounds and new capabilities to defeat hostile EW, particularly radar and GPS jamming. It also requires expanded capabilities for executing electronic attacks on adversary’s communications and sensor systems and even platforms such as UASs.
- Improved tactical sensors. The combination of the miniaturization of electronics and sensor arrays, coupled to improved tactical networks and data processing could result in a revolution in the ability of tactical units to see and act on the modern battlefield. Man-

portable radars and low cost, high resolution Electro-Optical/Infrared sensors can serve as “electronic binoculars” for tactical units. Planned investments in third generation FLIR is one aspect of what should be a broader effort to exploit existing technologies.

- Aircraft survivability enhancements. Surface-to-air threats are both proliferating, particularly in ungoverned spaces, and becoming more lethal. The Army must move forward with equipping its aerial fleets with appropriate countermeasures. Also there is the need to take measures to reduce the risks posed by brownouts and bad weather.

With respect to long-term modernization, Army S&T still appears to be supporting too many programs given likely procurement budgets. The Army needs to take seriously the mantra “buy what you can, develop only what you must.” Where there are viable commercial or foreign military systems that answer a critical need or fills a gap, this should be the preferred solution even if it meets only the 80 percent performance threshold.

The Services’ long-range S&T plans, like those of OSD, may contain a fundamental flaw. They assume that a set of technologies can be identified and developed that will provide the U.S. with decades of advantage. This is the heart of Deputy Secretary Robert Work’s Third Offset Strategy. The flaw in this approach, actually more of an Achilles heel, is the assumption that the U.S. alone will be able to acquire, exploit and sustain the advantages of new breakthrough technologies as it did in the case of the prior two offsets: nuclear weapons and precision navigation/targeting and stealth.

Economists and business leaders are beginning to consider whether the pursuit of enduring competitive advantage in commercial activities makes any sense. This approach fails to take adequately into account the globalization of S&T, shifts in the locus of manufacturing, particularly from West to East and the impact of cyber espionage. At best, these sources argue, companies will possess transient competitive advantage and must adjust their business strategies accordingly. This phenomenon is particularly apparent in commercial IT and electronics.²

But transient competitive advantage may also be playing out in defense. In July 2009, former Secretary of Defense Robert Gates canceled the F-22 program after contracting for 187 aircraft largely on the grounds that the United States had the competitive advantage in stealth aircraft for the foreseeable future. Beijing unveiled its fifth-generation stealth fighter, the J-31, in November 2014. It should be noted that the critical technology areas identified by OSD as candidates for exploitation in the new offset strategy -- robotics, autonomous operating guidance and control systems, visualization, biotechnology, miniaturization, advanced computing and big data, and additive manufacturing like 3D printing -- are commercial in character and globally available.

The Army’s modernization strategy -- innovate, improve, invent -- would make great sense if time were on its side, future contingencies were reasonably predictable and budgets were stable.

² Rita Gunther McGrath, *The End of Competitive Advantage: How to Keep Your Strategy Moving as Fast as Your Business*, Harvard Business School, 2013

Unfortunately, the Army cannot really count on any of these factors to break its way. The way forward would be much easier to chart if the military, in general, and the Army, in particular, had not been focused on the conflicts in Southwest Asia and the global war on terror and had not overreached on a number of major weapons programs. Unfortunately, potential adversaries not only have gone to school on the so-called American way of war, but have sent much of the past decade investing in an array of weapons systems and platforms that have allowed them to counter or narrow erstwhile U.S. advantages and even, in some cases, forge a lead. As a result, the Army's path forward entails significant risk.

But in a larger sense, the actual question is not what path should Army modernization take but will there be any Army modernization at all? Under even the most optimistic scenarios, defense spending will rise too slowly to provide relief from the inevitable rise in prices, the inexorable demands on available resources by must-pay bills for O&S and the impending modernization bow wave that characterize the Navy and Air Force long-term acquisition programs in particular. In this or a flat defense budget scenario, the Army's procurement accounts are likely to be slowly bled dry. Less optimistic scenarios, such as a failure to deal with the disaster that is sequestration, could see modernization disappear.

The reality is that the Army is on the horns of a dilemma. Given likely budget scenarios, the Army more than any of the other Services is confronted by the need to choose between capacity and capability. Or put another way, people or things. Based on likely defense budget scenarios, the Army cannot be large, ready and modern. The Army of 2025 will be either large, only modestly ready or with tiered readiness and saddled with increasingly obsolescent equipment or it will be smaller, possibly substantially so, but be highly ready and reasonably modern.

I would observe parenthetically that the choices I just defined have major implications for the structure of the Total Force and the balance between the Active and Reserve Components. Taking the first path means that the National Guard will inevitably return to the role of a strategic reserve. The costs associated with maintaining the manpower and equipment associated with this larger force inevitably means a scarcity of resources for training and modernization. The hard won skills and experience the National Guard earned through two wars will inevitably dissipate over time or simply become irrelevant to the conflicts of the decades to come. This problem will be compounded by a dearth of unit training opportunities. Shrinking procurement budgets mean that improvements and upgrades will be procured in relatively small numbers and inevitably husbanded for use by the Active Component. Finally, demographics will work against the Army on this path. It is likely to be increasingly difficult and expensive to recruit the size cohort required, further negatively impacting training and modernization.

The second path, reducing end-strength and “harvesting” manpower, if properly managed, holds out the prospect for the National Guard retaining its hard won role as an operational reserve. In fact, given the pattern of demands on the Army for deployable forces, it would be all but inevitable that as the Total Force shrinks further, both the Active and Reserve Components, that there will be demand for the latter to work side-by-side with the former.

The Army needs to take additional pro-active measures to further reduce end-strength, change long-standing manning concepts for systems and units and finds new ways of training, deploying and employing the Total Force. These could include targeted investments in such areas as distance learning and remote training, advanced simulators and automation.

With respect to automation, the Army needs to grapple with fundamental issues such as the size of the infantry squad and the number of people in vehicle crews. Crew/squad size and desired levels of protection are the two factors that determine the size and weight of combat vehicles. Reductions in the former are the most direct way of enabling the creation of smaller, lighter and even cheaper vehicles without a reduction in protection and other performance parameters. Use of an automatic loader can shrink the size of the crews on main battle tanks and even light mobile firepower platforms. The more significant change would come from downsizing the infantry squad or, at a minimum, accept the necessity of splitting the squad between two vehicles. This appears to be the answer that is emerging with respect to the ultralight combat vehicle.

I was asked to come before you and speak on the subject of Army equipping and modernization. I will tell you I believe the subject is largely irrelevant because any answers I might provide are highly dependent on the choice of paths discussed above. I would urge you to help the Army identify a path to the future. You can do so if you answer but two questions: How big? How modern?