This report describes the Army After Next (AAN) cycle of events during fiscal year (FY) 1999, discusses issues that arose during this cycle, presents observations on the Spring Wargame (SWG), and offers suggestions to improve the AAN process. Although the Transformation Plan has now largely taken the place of the AAN process, many of the issues that emerged in AAN SWG-99 merit examination in relation to the Army as envisioned in the current Transformation Plan.¹

PURPOSE OF AAN

In February 1996, the Chief of Staff of the Army gave the Commander of the U.S. Army Training and Doctrine Command (TRADOC) a broad charter to explore the nature of warfare thirty years into the future and to help develop a long-term vision of the Army. The mission of the AAN project was to conduct broad studies of war to about the year 2025, frame issues vital to the development of the U.S. Army after about 2010, and provide issues to senior Army leadership

¹The Army Transformation Plan envisions the transformation of the Army along three paths: the Objective Force, the Legacy Force, and the Interim Force. The objective is to produce a force that is responsive, deployable, agile, versatile, lethal, survivable, and sustainable. The Objective Force will eventually encompass the entire Army. It will be capable of placing a combat brigade anywhere in the world in 96 hours; putting a division on the ground in 120 hours; and placing five divisions on the ground in theater in 30 days. The Legacy Force is essentially today’s Army recapitalized through modernization programs such as the insertion of digital technologies. The Interim Force will bridge the gap in capabilities between today’s Army and the Objective Force. See http://www.army.mil/armyvision/transform.htm for more information on Army Transformation.
in a format suitable for integration into TRADOC combat development programs. This long-term vision was designed to connect to the Army’s research and development programs. The Strike Force initiative embodied AAN concepts and was to provide a bridge from current Army forces, using today’s technologies, to future Army forces, exploiting technological breakthroughs. The Strike Force concept was deleted from consideration while this report was being prepared. The concepts announced in the Transformation Plan are based in part on the results of AAN studies.

THE FIRST THREE YEARS

From a standing start four years ago, AAN has evolved into a highly sophisticated process, which includes integrated idea teams, franchises, tactical-level analyses, and technology seminars, culminating in a high-level, free-play wargame whose results are briefed to senior Army leadership. In each of the three years from 1997 through 1999, AAN has made important advances in the examination of Battle Forces, which embody futuristic thinking about Army forces. Battle Forces were notional organizations that would facilitate examining future warfare without the constraints associated with current units.

In the first year, AAN envisioned radically different Army forces, which could globally self-deploy and maneuver vertically to engage enemy heavy forces in fire ambushes (air-mechanized Battle Forces). The purpose was to stimulate innovative thinking unconstrained by current doctrine or—for the time being—foreseeable technology.

In the second year, AAN constrained air-mechanized Battle Forces by foreseeable technology and tested them against opponents who understood the air-mechanized concept and could develop counters. The result was to expose issues, including vulnerability to opposing air defenses, inability to hold ground, and lack of survivability in close combat, especially when imposed by urban terrain.

In the third year, AAN introduced a spectrum of Battle Forces, deployed in a variety of ways (airborne, airlifted, self-deploying by air, sealifted) and equipped with combat vehicles weighing from 2.5 to 26 tons. This spectrum allowed a much broader look at futuristic Army forces and comparative analysis of competing and complimentary concepts.
Since the announcement of the Army Transformation Plan, emphasis has shifted away from AAN to research focused on the forces and concepts associated with the new plan. Nevertheless, many of the ideas of the Transformation had their origin in AAN, and many of the issues raised in this report merit examination in terms of the Transformation Plan and the Interim and Objective Forces.

ISSUES

The following issues emerged from the AAN process during the FY99 cycle.

Coalition Warfare

Although prepared to fight alone if necessary, the United States usually fights in an alliance or coalition. During AAN SWG-99, coalition forces conducted operations, for all intents and purposes, as if they were U.S. forces. Differences in doctrine, communications, and proficiency of the various national forces were essentially nonexistent and coalition governments posed no limitations on the use of their forces.

If the United States could quickly and easily form a powerful and reliable coalition against a major competitor, it would be in the U.S. interest to train and equip non-U.S. forces to the highest possible standard, knowing that they would be the first to engage. Non-U.S. forces might substitute for U.S. forces. In the more likely circumstance that non-U.S. forces would not be as effective and could not be relied upon, the requirement for U.S. land forces would be greater than appeared during AAN SWG-99.

Strategic Preclusion

According to game material, strategic preclusion implied that U.S. forces would accomplish one or more of these objectives:

- Prevent an enemy from achieving his initial goals.
- Deter an enemy from escalating the conflict.
- Create conditions for an enemy to fail in the end.
RAND Insight: The third criterion tends to make strategic preclusion synonymous with eventual U.S. success. If the United States ultimately succeeds in a conflict, it will have created conditions for the enemy to fail. Thus even campaigns with extremely poor starts, e.g., the Pacific in World War II or the Korean conflict, satisfy this third criterion for “preclusion.” A better definition of strategic preclusion would read: “The United States and its allies achieve strategic preclusion by deploying capable forces so quickly that an enemy cannot achieve his initial goals or escalate the conflict to his advantage.”

Nuclear-Armed Opponent

If the United States tried to conduct a conventional campaign against a major nuclear power in a region contiguous to its homeland, the National Command Authority (NCA) would be concerned that the enemy would target all types of U.S. forces within his delivery range. If the NCA did decide to employ large land forces, they would have to operate in ways that did not create lucrative targets for nuclear weapons, take measures to survive nuclear use, and plan for recovery and reconstitution following a strike.

In a real-world situation, U.S. decisionmakers would be unlikely to commit U.S. forces against a nuclear-armed opponent without having decided in advance how they would respond to nuclear use. It is uncertain whether U.S. decisionmakers would believe that a nuclear-armed opponent would allow U.S. forces to attain strategic preclusion before he resorted to nuclear use.

Exploitation of Space

The United States would want to deny an opponent access to space-based intelligence, surveillance, and reconnaissance (ISR) while retaining its own access, but an all-out space war might blind both sides. Moreover, the United States and its allies might not be able to control commercial space assets except at the price of disrupting their own commercial viability.

During the Space Game, Red and the Commercial Team both adopted a policy of unconstrained access to space during conflict. In
contrast, Blue wanted to obtain a unilateral advantage in space and tried with little success to restrict Red access to commercial services, even at the expense of its own access. As a result, the Commercial Team perceived Blue as a bully and Red as a defender of international law.

If an opponent’s military systems were lost, he might still satisfy some of his ISR needs through access to commercial services. It is unclear how the United States and its allies could deny an opponent access to commercial service without severely limiting its own access. In view of these difficulties, an opponent might have at least some access to commercial systems during a conventional military campaign.

An actual decision to initiate space warfare by the United States or its opponents would be a complex one. Timing, determining which side would benefit more from a disruption of space assets, and the ability or inability to limit the effects and extent of a space war would influence such a decision.

**Sea Control**

The United States is accustomed to operating freely throughout the world’s oceans. But in some future conflict, it might need to gain sea control very rapidly in constricted waters against an opponent with modern weapons. For example, during AAN SWG-99, failure to quickly gain control of the Black Sea would have had a very significant impact on the campaign because Blue and Green forces and supplies flowed into the theater via Black Sea ports and Blue naval forces made significant contributions to the tactical missile defense (TMD) and interdiction of Red forces. Littoral warfare is of primary interest to the Marine Corps, but the Army might also be engaged. For example, light Army forces might operate again from an aircraft carrier as during the intervention in Haiti in September 1994.

**Air Superiority**

Air superiority is a complex mission that entails operations against manned aircraft, ballistic missiles, cruise missiles, and air defenses. The United States and its allies will probably continue to enjoy a
great advantage in all aspects of manned flight. Ballistic missiles, cruise missiles, and air defenses, especially low-level passive defenses, could pose greater challenges to allied air superiority.

Potential opponents may shift their emphasis to ballistic and cruise missiles. For example, during AAN SWG-99, Red used medium-range ballistic missiles, large numbers of cruise missiles, and conventionally armed intercontinental ballistic missiles (ICBMs) launched from Red's homeland to attack seaports and airfields used by Blue. Cruise missiles currently are expensive and therefore limited in numbers, even for U.S. forces, but advances in the micro-processing industry will almost certainly reduce costs.

**Sustainment**

In all likelihood, future forces will still depend on deployment and logistics support delivered through APODs (aerial ports of debarkation) and SPODs (seaports of debarkation), which could be vulnerable to air attack. Against such an opponent, the United States would require an effective theater missile defense, a difficult technical problem to solve.

Chemical weapons might also pose significant challenges, possibly much more than was the case in AAN SWG-99. During this game, Red used chemical weapons against Blue bases, but to little effect. Even well-trained military units might be severely affected and civilian workers, including some indispensable to base operations, might be incapacitated or take flight. To counter this threat, the United States and its allies would have to mount a comprehensive defense, which embraced not only military units, but also the civilian workforce. Additionally, the threat of chemical weapons might force the United States to fight from standoff distances for at least part of the campaign.

Battle Forces have a notional tempo of operations significantly faster than current Army forces and at greater distances from their support bases. Keeping these forces resupplied presents great challenges. Conceptually, Battle Forces would rotate through forward resupply points, for example in a scheme that kept four Battle Units available for combat while two Battle Units engaged in resupply. However, the game did not have enough granularity to test this concept.
Urban Terrain

In contrast to previous years, Battle Forces were designed as combined arms formations capable of operating in all types of terrain. However, they were optimized for rapid operational maneuver, and players therefore preferred to employ other forces, especially heavier forces in urban terrain. The Light-Motorized Battle Force was optimized for urban operations, but not employed in this way during the Spring Wargame.\(^2\) Players thought that operational commanders should consider alternatives to urban combat and undertake it only if required by the military situation or directed by higher authority for political reasons. It should be understood, however, that enemy actions may make urban battles unavoidable in some situations.

RAND Insight: Vertical maneuver would be very risky or infeasible against an opponent employing low-altitude air defense systems, especially man-portable missile systems, in urban terrain. Combat vehicles vulnerable to man-portable anti-tank weapons would have very limited utility. Long-range precision fires would encounter severe problems of masking.

Refugees During Conflict

Since the Korean War the United States has not had to conduct large ground combat operations while simultaneously handling problems posed by refugees. Some future contingency might simultaneously pose both requirements. During AAN SWG-99, the magnitude of the refugee problem hampered Blue operations. Initial deployment of Blue forces had been heavily biased toward combat units. As a result, support units were in short supply and Blue commanders initially lacked resources to address the refugee problem.

By 2020, the world’s population will be much larger and more heavily concentrated in urban areas. Future combat operations conducted near heavily populated areas will generate large numbers of refugees, who will impede military operations and require humanitarian assis-

\(^2\) The LMBF was located a considerable distance south of Tbilisi. It was adjudicated that the force would not be able to reach the city in time to contribute effectively. It was out of range because of its position in the TPFDD. Other priority units arrived ahead of it.
tance. Requirements for assistance may drain military resources, particularly in areas close to combat zones, where civilian relief agencies are not yet established. All the services may be affected, but especially the Army, which might have to operate intermingled with refugees. To solve this problem, the Army will need to develop its own first response plans and methods of handing off quickly to civilian relief agencies.

Air Mobility of Battle Forces

To realize the Battle Force concept, it was necessary for supporting aircraft to fly within range of low- to medium-altitude air defense systems, making survivability of these aircraft an issue. If the Army develops forces to exploit Super Short Takeoff and Landing (SSTOL), assets maintained by a sister service and centrally controlled, then allocation of these assets would become an issue. During AAN SWG-99, Blue inserted Battle Forces using SSTOLs owned by the Air Force and Joint Transport Rotorcraft (JTR) owned by the Army.

When airborne in forward areas at low altitude, SSTOL and JTR are vulnerable to ground-based air defenses. During AAN SWG-99, Red inflicted significant losses to JTRs and SSTOLs through low-altitude air defenses on several occasions. When on the ground, they are vulnerable to attack by ballistic and cruise missiles and other indirect-fire systems. It is technically infeasible to give these aircraft stealth characteristics, and arming them would have significant drawbacks. They might be provided with escorts, electronic countermeasures (ECM), and self-defense systems such as used in current special operations aircraft. The Army and Air Force might also develop joint tactical doctrine to reduce the vulnerability of these aircraft, for example by providing appropriate escort and sweeping their landing zones with fire. Additional challenges posed by the AAN concepts of air-mobile operations deep in the enemy rear include the issues of how U.S. forces will disengage following battles that take place in enemy-controlled areas, and what the enemy's ability to recover will be once air-mobile U.S. forces disengage and depart.

The Air-Mobile Battle Force (AMBF) concept required strategic airlift into theater and operational-level air mobility. Strategic airlift implies any transport aircraft capable of lifting forces over intercontinental distances (e.g., C-5, C-17, and C-141). Operational-level
air mobility implies an extremely robust aircraft capable of landing on level ground and unimproved airstrips, such as the SSTOL. To pursue such a concept for the Objective Force, the Army would have to procure SSTOLs (or comparable aircraft) or else be assured that the Air Force would procure them and make them available for operations.

Survivability of Battle Forces

Battle Forces were designed as light- to medium-weight forces deployed (with one exception) by air and maneuvering by air within theater. One type of Battle Force (the Mechanized-Armor Battle Force (MABF), see Appendix C) was designed for movement by ship, all other types were capable of air movement, including on organic aircraft. Like all such forces, they trade passive protection for mobility, causing their survivability to become an issue.

AAN SWG-99 suggested that the Battle Forces would be ready to operate offensively and defensively against a variety of threats in many different types of terrain. Aircraft survivability may be as great an issue as protection of ground systems. Finally, survivability may be significantly improved by degrading the enemy’s command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) systems.

Training Battle Force Soldiers

Several AAN franchise games highlighted the issue of training the future soldier. Higher operational tempo, dramatic increase in unit dispersion, and more flexible tactics would require intensive, highly sophisticated training to produce the required level of individual initiative at all levels.

To realize the operational concepts envisioned for Battle Forces, the Army would have to revise its training regime. This training would have to emphasize individual initiative and decentralized decision-making down to the level of vehicle commanders. Battle Force soldiers would have to become highly self-reliant, accustomed to operating for extended periods without immediate supervision or control. There would be a high demand for skilled soldiers in many
career fields at relatively low grades, unless Battle Forces were entirely manned by soldiers at mid-enlisted grades and above, as some special operations forces are today.

**Hybrid Force Employment**

In 2022 the Army will include both Army XXI forces and new types of forces that emerge from the AAN and Army Transformation processes. The game showed that both Army XXI and Battle Forces would have appropriate roles in a hybrid force. During AAN SWG-99, the main roles of Army XXI units were in combat service support and theater missile defense. In Case B, Army XXI maneuver forces had few opportunities for employment in combat. Instead, coalition forces (which were assumed to be very capable, generally self-supporting, and available in considerable quantity) performed many of the roles that might have been performed by Army XXI-type forces.

*RAND Insight:* Battle Forces, when combined with air, naval, and coalition ground forces, were assessed to be overwhelming. Essentially, whenever Blue ground forces engaged a Red unit, Red was defeated. Based strictly on game play, there was little need for Army XXI maneuver units, particularly in Case B. By the end of the game, Blue had routed or defeated Red while employing a small fraction of the Army’s total force structure. If the assessment process had concluded that the AAN-type forces were less successful, the role of Army XXI forces would have been greater.

**CONCLUSIONS**

AAN wargames would benefit from more realistic play of coalition operations.

AAN focused on coalitions formed of the United States with its European allies. These coalitions have tended to be remarkably free of problems. But in the real world, coalitions may be difficult to form and hard to lead effectively. At the very least, they will be affected by technical, organizational, and cultural incompatibilities. Insisting on

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3Although the Transformation Plan calls for an Objective Force that encompasses the entire Army, some current forces will probably continue to exist in the Army of 2020.
more realism would help generate more insights into the coalitions, especially the Army’s role in helping build and maintain them. More specifically, the role of future forces within coalitions needs exploration. Leap-ahead technologies would give these forces capabilities unmatched even by the closest U.S. allies and also create technical incompatibilities.

AAN SWG-99 suggested that highly effective coalition forces might substitute for Army XXI maneuver units.

From the inception of the AAN project, the Army assumed that its forces in 2020–2025 will be hybrid, i.e., a mix of Army XXI units and more modern Battle Forces. The past three iterations generated insights into how these disparate forces might operate together. During the first two iterations, Battle Forces arrived earlier and maneuvered more rapidly (by air). They destroyed or disrupted opposing forces before they could respond effectively. Army XXI forces arrived later and maneuvered more slowly (by land). They consolidated the gains made by Battle Forces and accomplished essential missions, especially seizure of key urban areas, which exceeded the capabilities of Battle Forces.

During AAN SWG-99, Battle Forces operated in conjunction with powerful U.S. Air Force, Navy, and Marine Corps elements plus highly capable coalition forces. In contrast with earlier iterations, Battle Forces had less opportunity to operate in conjunction with Army XXI maneuver units, particularly in Case B. To a large extent, coalition ground forces had the role played by Army XXI forces during previous iterations. Had the assessment process come to different conclusions about the effectiveness of Battle Forces, or had coalition forces been less capable or less numerous, the role of Army XXI maneuver units would have been more important.

FY99’s widened spectrum of Battle Forces was an important advance for AAN research.

During the first two years, the AAN project focused attention on ground forces that employed some form of airlift in theater. But during the third year, the AAN project examined Battle Forces that used other operational concepts. At one end of the spectrum, the Light Airborne Battle Force (LABF) with 2.5-ton vehicles could air-drop into a theater of operations, while at another end of the spec-
trum, the MABF with 26-ton vehicles went by sealift. This move toward multiple types of notional Battle Forces provided more options for exploration. As TRADOC explores the Objective Force, analysis and gaming should consider a wide range of alternative forces and operational concepts.