This chapter presents major issues, framed as research questions related to the themes and objectives set for the AAN process. For each question it gives responses, which emerged from franchise games and the AAN SWG-99 series. Finally, it offers analysis of implications for the future Army. RAND formulated these questions to reflect game play. They are related to themes and issues presented in the Army After Next FY99 Study and Research Plan developed by TRADOC (see Appendix A). The topics are generally arranged in order of strategic issues (e.g., coalition warfare, strategic preclusion), followed by issues related to joint operations (e.g., sea control, air superiority, sustainment), and finally issues that are more Army-specific, such as survivability of Battle Forces and Hybrid Force employment.

COALITION WARFARE

Research Questions

*How could the United States form coalitions and make them militarily effective? How could the Army make its best contribution?*

1This issue relates to the following AAN themes and objectives: “1. Strategic Setting: What new challenges will the strategic environment of 2025 pose for the conduct of military operations and the establishment or sustainment of security alliances? 9. Coalition Operations: a. What essential characteristics and capabilities must AAN forces possess to enable interoperability in combined commands? d. How can coalition forces be most effectively employed with AAN-era forces conducting operations in urban terrain?” U.S. Department of the Army, Army After Next FY99 Study and Research Plan, Version 7.1, “Annex A, AAN Themes, Objectives, and Issues Study and
Although prepared to fight alone if necessary, the United States usually fights in an alliance or coalition. Therefore, forming such groups and making them militarily effective are fundamental concerns.

Game Play: Political Aspects of Forming a Coalition

During the National Security Seminar, Blue believed that to oppose Red successfully it would need a strong coalition of willing nations drawn from members of the North Atlantic Treaty Organization (NATO). Politically, Blue had to assure that the other coalition members, who would be the primary beneficiaries of a successful defense of the Transcaucasus, would bear their share of the burden. Militarily, Blue wanted coalition members to commit forces early in a campaign. These forces included Turkish land forces and highly mobile assets of other coalition members, especially carrier-based and land-based attack aircraft and rotary-wing air assault units. Moreover, Blue needed transit and basing rights for its forces.

The Blue President observed that in the real world the United States tends to regard its coalition partners as indispensable for political reasons but marginally useful for military operations. From an operational perspective, the United States tends to treat coalition partners as irritants rather than helpers. He felt that the United States would have to change this attitude if it hoped to develop effective coalitions. Recent U.S. experience seems to support these insights, particularly in the case of “out of area” combat operations in which coalition forces often play a relatively minor role in U.S.-led operations.

Red’s provocative prewar actions played into Blue’s hands. Prior to hostilities, Red tried to hide attack submarines along sea lanes, infiltrated thousands of SOF into Turkey, and mined coastal waters. This last action clearly betrayed Red’s intentions and provoked strong reactions from coalition members. In response, Blue and Turkish naval forces began clearing sea mines. Additionally, Blue deployed Los Angeles–class attack submarines into the Black Sea, two aircraft

carriers into regional waters, and an Air Expeditionary Force (AEF) to Turkey. At the same time, Blue planned confidentially for the early use of a wide range of coalition forces.

Even considering Red’s provocative actions, the Blue President was pleasantly surprised when Green immediately and enthusiastically joined an anti-Red coalition. Without prompting, Green presented a list of Green forces available for planning purposes. Turkey, the state most directly threatened by Red retaliation, committed itself to the coalition without reservation. However, there was no person on the Green Team who was specifically charged to play Turkey and, therefore, the game lacked an independent Turkish perspective.

During the NSS, a coalition went to war much more easily and quickly than would be likely in the real world. Would Turkey, which bordered on the Soviet Union for most of the 20th century, go to war to prevent recurrence of a comparable situation, especially considering that Turkey feels no affinity for Azerbaijan and Georgia? Would other coalition members feel sufficiently threatened by events in the Transcaucasus and Black Sea to undertake a major war against a powerful, nuclear-armed opponent? During the NSS, the answers to both questions were resounding, unqualified assents. In the real world, the answers would likely be more problematic.

**Game Play: Interoperability of Military Forces**

During the SWG, Blue players discerned two broad issues in interoperability: (1) C4ISR and (2) logistics resupply.

**C4ISR.** Some Blue players thought that allies could not afford required systems and therefore would lag behind the more advanced U.S. forces. As a result, U.S. forces would not share a common picture with coalition forces at the operational and tactical levels and might also have difficulty communicating. Other Blue players were less certain that coalition partners would lag behind. They suggested that coalition partners might eventually acquire comparable capabilities to the United States at much lesser cost by exploiting advances in information technology that will be commercially available. As an example, they pointed to the Global Positioning System (GPS), originally developed for U.S. forces and now accessible through a variety of low-cost commercial systems. In this view, the
United States is absorbing large start-up and development costs that its allies may avoid by delaying their acquisition of like capabilities. Also raised by some players was the issue of the United States sharing sensitive intelligence information with coalition partners, even when the latter are members of NATO.

**Logistics resupply.** Some players expressed doubt that a system of national responsibility for most classes of supply would have worked as smoothly as represented in the game. At peak, nine nations were operating in the Transcaucasus and Turkey: Australia, United Kingdom, Canada, France, Germany, Italy, Norway, Turkey, and the United States. Some players found it hard to envision how this number of national supply systems could have functioned efficiently during high-tempo operations.

**Analysis and Discussion**

During the SWG, coalition forces conducted operations, for all intents and purposes, as if they were U.S. forces. Coalition partners simply ratified U.S. strategy and contributed their forces. Differences in C4ISR and logistics support played almost no role.

It is at least doubtful whether a coalition of NATO members, much less NATO itself, would make security commitments in the Caspian Sea region, and the members would probably have divergent views on goals and strategy. Differences in C4ISR and incompatibilities in national logistics systems would also pose problems within a coalition. In all these respects, AAN SWG-99 underplayed the inherent difficulties of coalition warfare. Coalition units were, essentially, under the unqualified control of the U.S. leadership, and were assumed to be capable of arriving in theater and supplying themselves with their own national assets. The level of resolution during AAN SWG-99 was admittedly constrained, thus limiting the ability to examine coalition issues in detail.

If, as seems unlikely, the United States could quickly form a coalition against a major competitor and interoperability would pose little dif-

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ficulty, there would be several implications for the future Army. First, 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. Second, non-U.S. forces might substitute for U.S. forces in some roles. In this scenario the presence of large numbers of Turkish heavy units with Army XXI–like capabilities obviated the need for many U.S. heavy forces, particularly in Case B, where there were more of the futuristic units present. If, however, these conditions could not be met, the requirement for U.S. ground forces would increase relative to the inability of coalition forces to perform critical ground force missions.

STRATEGIC PRECLUSION

Research Questions

*How might the United States attain strategic preclusion? What are the associated risks and benefits? How could the Army best contribute?*

Strategic preclusion is the idea of moving so fast and with such lethality that enemies cannot “set” forces and operate at advantage.4

Fully realized, Strategic Preclusion requires joint force capabilities and methods that can, upon the NCA decision to use military power, move with such velocity and lethality that they preclude the enemy from establishing his force at an operational advantage against our force build up. Strategic preclusion can be seen as an active form of deterrence achieved by deploying substantial, relent-

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3This issue relates to the following AAN themes and objectives: “1. Strategic Setting: c. How does the enemy operational concept challenge U.S. forces? 2. Force Projection: h. What are the most promising approaches for meeting force projection requirements in support of strategic preclusion? 4. Hybrid Force Employment: c. What are the strengths and limitations of the various campaign alternatives considered by the CINC?” *Study and Research Plan, Annex A.*

less and even decisive force at the right time and place to deny the enemy critical objectives.  

The concept of strategic preclusion is closely associated with advanced full dimensional operations (AFDO).

Advanced Full Dimension Operations: Rapid, simultaneous, continuous, and dynamic application of integrated joint military capability, centered on the complementary and exploitative application of joint interdiction and maneuver, achieves such dominance across all military dimensions that an opponent is unable to set or maintain conditions favorable to accomplishment of his strategic, operational, or tactical goals. This overwhelming situation places an opponent at such a disadvantage that he concedes, disintegrates or is set up for failure in the face of follow on forces or continued decisive operations.

This synergy of action [Advanced Full Dimensional Operations] precludes an enemy from setting or maintaining conditions favorable to the accomplishment of his strategic, operational, or tactical goals. . . . At a minimum, an early application of AFDO would set up an enemy for failure in the face of follow on forces conducting extended operations aimed at conflict termination.

Responding comprises both rapid response operations focused on achieving preclusive effects—preventing an enemy from achieving his objectives and arresting escalation—and extended operations that may require more deliberate actions and greater mass, whether from the outset or as a follow on to preclusive actions. While Preclusion [capitalization in original] is initially reactive rather than preemptive, rapid AFDO dramatically changes that paradigm wresting the initiative and overwhelming an enemy and forcing capitulation. Preclusion is not preemption.

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7Ibid., p. 2.

8Ibid., p. 8.
Game Play: Attainment of Strategic Preclusion

**Force Projection Game.** During the Force Projection Game, players produced Time Phased Force Deployment Data (TPFDD) to support concept plans intended to achieve strategic preclusion. The Assessment Team judged that Blue had been delayed one to three days by Red actions. In Case A, Blue had marginal success in precluding Red occupation of Azerbaijan and Georgia. In Case B, Blue had greater success. The Assessment Team judged that several Battle Forces would be astride main routes and in position near key cities before Red could organize strong defenses. But Red forces attained their initial operational objectives and were prepared to fight the recently arrived Blue forces.

**National Security Seminar.** During the National Security Seminar, Blue players doubted that they could attain strategic preclusion against Red in this theater, in the sense of denying Red its initial objectives. CINCWES and his deputy commander in chief (DCINC) estimated that Red forces could seize important objectives, including Tbilisi, which dominated the east-west line of communication (LOC), and the oil-producing regions around Baku within a week. Blue would need more time to deploy forces for a successful campaign, even given the expected prehostility deployments. CINCWES and his DCINC stated that if they could not achieve strategic preclusion, they saw no reason to commit Blue forces hastily, noting that a hasty commitment might cause losses that would affect public opinion in the coalition states. The Blue Secretary of State concurred with this advice, observing that strategic preclusion might be "too costly.”

**Pre-Assessment and Spring Wargame.** During the Pre-Assessment, Blue ground forces conducted offensive operations into Azerbaijan and Georgia starting on D+6 in Case B, and D+10 in Case A. This was an ambitious timeline, especially given the magnitude of the Red force. One of the reasons for the difference in timing between the two cases was a much more aggressive air operation in Case B, intended to achieve air superiority in a shorter number of days than in Case A. This condition was assessed to have been achieved, but with significantly higher Blue air losses in Case B than in Case A.

The ability of Blue to conduct offensive operations into Azerbaijan and Georgia at such early dates in the campaign was based on the AAN Force Projection Game conducted in February 1999, which...
concluded that the early deployment of substantial land forces in eastern Turkey was feasible. Additionally, the efforts of the Blue air and naval forces in the first week of the war helped set conditions for the early introduction of Blue ground units into Azerbaijan and Georgia. Assessment concluded that the self-sustainment capabilities of the Blue ground forces that had arrived in eastern Turkey, combined with host nation assistance from Turkey, would allow offensive operations before the arrival of significant numbers of Blue logistics units. The Force Projection game showed that Blue would have difficulty attaining deployment timelines in both cases. The initial Blue ground offensive operations consisted of Turkish units moving into southwestern Georgia, Marine amphibious forces landing near Poti, and air assault units landing near Tbilisi and Agnan. The concept of strategic preclusion influenced these early offensive uses of ground forces, the intention being to gain positional advantage and disrupt Red’s operational plan. Although Red had seized most of its initial objectives in Azerbaijan and Georgia, Red had not yet completed consolidation when Blue ground offensive operations began.

Analysis and Discussion

According to game materials (see above), 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 U.S. success. If the United States ultimately succeeded in a conflict, it must have created conditions for the enemy to fail.

Table 3.1 shows how the definition might be applied across a range of U.S. wars.

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According to the third criterion, the early phases of World War II in the Pacific and the beginning of the Korean War count as "strategic preclusion," although they included the fall of Corregidor and the defeat of Task Force Smith. Operation Desert Shield also qualifies, even though U.S. light forces might have suffered badly had Iraq chosen to invade the Eastern Province of Saudi Arabia early in the campaign.

**Table 3.1**

**Strategic Preclusion in Selected Wars**

<table>
<thead>
<tr>
<th>Civil War (federal government as “friendly”)</th>
<th>1. Prevent an enemy from achieving his initial goals.</th>
<th>No. The Confederacy initially established de facto independence from the federal government.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Deter an enemy from escalating the conflict.</td>
<td>No. For example, the Confederacy invaded northern states and conducted commerce raiding.</td>
</tr>
<tr>
<td></td>
<td>3. Create conditions for an enemy to fail in the end.</td>
<td>Yes. The federal government defeated Confederate invasions, blockaded the South, averted foreign recognition, and built up its strength.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spanish-American War</th>
<th>1. Prevent an enemy from achieving his initial goals.</th>
<th>No. The U.S. failed to prevent brutal suppression of the rebellion in Cuba, which became one cause for the war.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Deter an enemy from escalating the conflict.</td>
<td>Yes. However, Spain had no serious escalation options.</td>
</tr>
<tr>
<td></td>
<td>3. Create conditions for an enemy to fail in the end.</td>
<td>Yes. U.S. naval forces controlled the sea, isolating Spanish garrisons.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>World War II (Pacific Theater)</th>
<th>1. Prevent an enemy from achieving his initial goals.</th>
<th>No. Japanese forces overran most of Southeast Asia, including the Philippines, inflicting a humiliating defeat.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Deter an enemy from escalating the conflict.</td>
<td>No. Japan invaded the United States in the Aleutian Islands.</td>
</tr>
<tr>
<td></td>
<td>3. Create conditions for an enemy to fail in the end.</td>
<td>Yes. U.S. naval and Marine forces early set conditions for successful “island hopping.”</td>
</tr>
</tbody>
</table>
Table 3.1—continued

<table>
<thead>
<tr>
<th>Korean War (prior to Chinese intervention)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Prevent an enemy from achieving his initial goals.</td>
<td>Partially. U.S. and South Korean forces prevented North Korean forces from seizing the entire peninsula.</td>
</tr>
<tr>
<td>2. Deter an enemy from escalating the conflict.</td>
<td>No. However, the North Koreans' only effective option was infiltration, terrorism, and guerrilla action.</td>
</tr>
<tr>
<td>3. Create conditions for an enemy to fail in the end.</td>
<td>Yes. Holding the port of Pusan allowed rapid buildup of overwhelming U.S. force.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Persian Gulf War (Operations Desert Shield and Desert Storm)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Prevent an enemy from achieving his initial goals.</td>
<td>No. Iraqi forces seized Kuwait.</td>
</tr>
<tr>
<td>2. Deter an enemy from escalating the conflict.</td>
<td>Uncertain. Saddam Hussein may or may not have intended advance beyond Kuwait.</td>
</tr>
<tr>
<td>3. Create conditions for an enemy to fail in the end.</td>
<td>Yes. United States and allies built up overwhelming force in friendly Gulf states.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Kosovo Conflict (Operation Allied Force)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Prevent an enemy from achieving his initial goals.</td>
<td>No. Yugoslav forces initially controlled the province of Kosovo.</td>
</tr>
<tr>
<td>2. Deter an enemy from escalating the conflict.</td>
<td>No. Yugoslav forces responded with large-scale &quot;ethnic cleansing.&quot;</td>
</tr>
<tr>
<td>3. Create conditions for an enemy to fail in the end.</td>
<td>Yes. NATO isolated Yugoslavia and subjected it to ever increasing punishment.</td>
</tr>
</tbody>
</table>

RAND Insight: 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.” If the enemy does achieve his initial goals, U.S. response will take the most advantageous course. In some cases, e.g., Korea in 1950, rapid transition to offensive operations might be most advantageous. In other cases, e.g., the Persian Gulf in 1990–1991, deliberate buildup of overwhelming combat power might be most advantageous.
Early arrival of land forces may be critically important early in a campaign. Thereafter, it may be to U.S. advantage to deliberately build up overwhelming force. The goal should be to make Army forces more readily deployable in strength that would preclude early debacles, such as the loss of the Philippines in April–May 1942 and the humiliating defeats in Korea during June–July 1950. In August 1990, the Army needed rapidly deployable forces that could safely secure the Eastern Province of Saudi Arabia or better yet prevent Iraqi forces from overrunning Kuwait. In March–June 1999, the Army needed rapidly deployable forces that could stop “ethnic cleansing” in Kosovo or at least make air power more effective by threatening invasion. For example, the United States might have deployed several brigades to northern Albania, impelling Yugoslav commanders to either concentrate their forces, increasing their vulnerability to air attacks, or to remain dispersed, risking an invasion they could hardly oppose.

During AAN SWG-99, Blue did not deny Red its initial objectives, but did place Red at a decisive disadvantage, thereby achieving strategic preclusion. Blue attained this success through rapidly establishing sea control and air supremacy; through early employment of coalition forces, especially Turkish land forces; and through Battle Force operations in Case B. There are several alternative ways to develop the required land combat power: forward deploy U.S. land forces during peacetime, deploy U.S. land forces rapidly during crisis and conflict, and use coalition land forces already in or near the theater of operations. In AAN SWG-99 Blue used all three ways, with coalition forces playing a critical role.

Blue and Green players had strategic warning of Red intentions, because Red mined areas of the Black Sea and inserted large numbers of SOF, some of whom were detected. Prior to Red D-day, Blue and Green conducted countermine operations to clear safe passages

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10 However, lack of such forces was not the only, or even the primary cause for debacles suffered early in the Philippines and Korea. A flawed strategy, that relied more on bluff than preparedness, was primarily responsible for the disastrous defeat of U.S. and Philippine forces on Bataan and Corregidor. Gross underestimation of the North Koreans’ military aptitude led to the hasty deployment of Task Force Smith.
through the Black Sea. Blue deployed attack submarines into the Black Sea, one AEF into Turkish airbases, and air defense forces. Beginning on D-day, Red rapidly deployed forces into Azerbaijan and Georgia, seizing the key objectives of Tbilisi and Baku, but Blue forces prevented an amphibious landing in Georgia.

As the game unfolded, coalition land forces played a critical role by delaying Red forces and seizing key terrain. Immediately following the Red invasion, two Turkish corps entered Georgia from the south and engaged Red forces. Turkish forces seized Batumi, defeated a Red attack from the north, and advanced toward the major east-west LOC near Tbilisi. At game’s end, Turkish forces were in the city of Tbilisi, helping to open and secure the vital LOC between heavy Blue forces in Georgia and light Blue forces in Azerbaijan. In addition, German, Italian, and Norwegian air assault units, that included large numbers of attack helicopters, were extremely effective in both cases. In Case B, these units were successfully employed against Red forces in the vicinity of Tbilisi, although they suffered heavy casualties.

The concept of strategic preclusion required an early ground offensive, but this aggressive use of the limited ground forces available this early in the campaign was controversial. At the time ground offensive operations were initiated, Blue had barely won air superiority against the Red fighter force, and Red’s ground-based air defenses appeared formidable. Additionally, Blue’s APODs and SPODs were still under intense cruise missile attack. At this point in the campaign, Red had a significant superiority in numbers of ground forces in Azerbaijan and Georgia, and many of these Red units had already gone into defensive positions when Blue ground offensive operations started. Given the very early start of Blue’s counteroffensive, there would have been minimal opportunity for Blue fires to have degraded Red’s ground units prior to offensive operations, especially in Case B. The correlation of ground forces was not in Blue’s favor at this time in the campaign. For example, on D+6 in Case B, elements of the 82nd LABF (closely followed by a German air assault brigade) landed in the vicinity of Tbilisi. No other allied ground units were anywhere near the city at that point.
Meanwhile, the reinforced Red 12th Corps, consisting of roughly nine maneuver brigades plus supporting artillery, attack helicopters, and surface-to-air missiles (SAMs), was in the vicinity of Tbilisi. When elements of the 82nd LABF and other coalition units landed in this vicinity they faced the prospect of many days of operations before other Blue ground units arrived overland from Turkey or Poti. Whether a U.S. commander (or the political leadership) would have accepted such a risk is questionable. Equally doubtful is the prospect that allied leaders would sanction such bold use of their units. While there are some advantages to conducting operations in the depth of the enemy array, in this case the reality of the situation was that a U.S. and coalition command would have had to be willing to commit heavily outnumbered ground forces into the midst of a powerful opponent, at locations hundreds of kilometers from friendly ground forces with an air bridge as their only means of resupply.

Finally, the timelines of the ground offensive operations into Azerbaijan and Georgia were very ambitious from a force deployment and logistical standpoint. The U.S. ground forces had barely arrived in Turkey when they were committed to offensive operations. Other than the few days of self-sustainment brought with the arriving forces, there would have been very little logistical support in place in Turkey to support early offensive operations. When Army ground forces were first committed in Azerbaijan and Georgia, they had to be supplied by air from recently established logistics bases in Turkey.

The ability to achieve strategic preclusion depends on the situation. In some circumstances the concept may be feasible. In other situations, however, the very rapid introduction of ground forces in the face of a superior enemy would be a highly risky proposition. In that situation a more deliberate campaign would be more advisable. In AAN SWG-99, generous assumptions were made about strategic lift, infrastructure improvements in Turkey, the ability to quickly gain a consensus among allies, and the willingness of U.S. and coalition leaders to commit forces in an offensive mode into a dangerous situation. Given the potential power of the Red force, it is very possible that a coalition would decide to deploy and operate in a more deliberate, cautious manner than occurred during AAN SWG-99.
NUCLEAR-ARMED OPPONENT

Research Questions

*How might the United States fight a conventional campaign against a nuclear-armed opponent? How could the Army prepare for theater nuclear war?*

During the Cold War, the United States and its allies planned theater-level use of nuclear weapons to avert catastrophic defeat in conventional war, especially on the Central Front in Europe. Similarly, a nuclear-armed opponent might threaten nuclear use or actually use nuclear weapons rather than accept large-scale defeat in conventional war.

Game Play: Planning a Conventional Campaign

During the NSS, Blue planners thought that Red might use or threaten to use its large nuclear forces. These consisted primarily of strategic weapons but also included tactical nuclear weapons as a bolster to relatively weak conventional ground forces. Game materials noted that “Delivery means (artillery, rockets, missiles, and bombs) remain plentiful in the air and ground forces.”

The Blue Secretary of State recommended that Blue warn Red that any use of nuclear weapons would elicit a “strong response.” The Blue President recalled U.S. policy during the Persian Gulf War, especially the deliberate ambiguity in warnings conveyed to Saddam Hussein, who was known to have chemical weapons and to be developing nuclear weapons. Principal advisors agreed that Blue should not commit itself to any particular course of action in advance, but that it should issue a strong warning to Red not to employ weapons.

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11This issue relates to the following AAN themes and objectives: “1. Strategic Setting: i. How does possession of WMD by nations and transnational organizations affect U.S. decisions to conduct military operations? 7. Homeland Defense: e. How will proliferation of WMD affect the military role in homeland defense?” Study and Research Plan, Annex A.

Issues

of mass destruction (WMD). Discussants made little distinction between in-theater and out-of-theater nuclear use, but they thought that Red would probably not use nuclear weapons against the Blue homeland because Blue would retaliate.

Blue planners realized that Red might respond strongly to attacks within its homeland. Therefore, they considered whether to draw a line of maximum penetration into Red territory, for example 48° north latitude as provisionally assumed in contingency planning. It should be noted that this restriction applied to Blue air and SOF operations; no operations inside Red by conventional Blue ground forces were contemplated. After soliciting comment from his principal advisors, the Blue President decided not to draw any line restricting operations in the Red homeland. He thought that such a line could create a sanctuary for Red forces capable of ranging into the theater of operations. But he reserved to himself approval for strikes against the Red capital and Red strategic nuclear weapons sites.

Published guidance for Blue military planners contained a section entitled “General WMD [weapons of mass destruction] Guidance” that dealt only with chemical weapons. But under the heading “Constraints & Conditions/Timing & Thresholds” appeared this statement: “In the event that FES uses WMD, Blue response will not be limited to conventional weapons or theater war objectives.” The same section noted that the Blue Secretary of Defense would prepare options for Presidential review.

In prewar planning, Red’s political leadership contemplated using nuclear weapons if Red were about to suffer a major conventional defeat. Red leaders believed that nuclear war could be limited to the theater of operations and that a nuclear strike in theater could avert a Red defeat. The Red leadership contemplated nuclear strikes against APODs, SPODs, Blue’s naval forces, and Blue’s key ground units.

However, the Red campaign plans for Operation Red Destiny made no provision for use of nuclear weapons.\(^\text{14}\)

**Game Play: Responding to Theater-Level Use**

During the SWG, Red quickly found itself at a severe disadvantage. Blue defended successfully against massive Red air and missile strikes. A Turkish corps was advancing into Georgia, and Blue forces were arriving rapidly in theater. Red had two broad alternatives to improve this situation: commit a second strategic echelon of forces, or use nuclear weapons. Red believed that Blue would quickly destroy a second strategic echelon and therefore saw nuclear weapons as its only recourse. Game Direction disallowed nuclear use, because it would have focused the game on nuclear issues at the expense of the research objectives set for AAN SWG-99.

Had Game Direction allowed nuclear use, Blue would have been confronted with an extremely difficult situation. Blue could not escalate conventionally in theater because it was already doing its utmost. If Blue attacked conventionally outside the theater, it would widen the war with unforeseeable consequences. If Blue used nuclear weapons in theater, it would increase the damage to an area it had set out to save from depredation. If Blue used nuclear weapons outside the theater, it might provoke an exchange that would devastate both sides.

To explore the nuclear issue, Game Direction organized a sidebar discussion among high-level Blue players. At the beginning of this discussion, some Blue players were inclined to dismiss Red’s nuclear use as the act of a “madman,” but by the end of the discussion most seemed to feel that Red’s action was not only rational but quite possibly to Red’s advantage. During the course of this discussion, Blue players considered a wide range of alternatives, including a pause in military operations to encourage negotiation, conventional escalation in theater, conventional escalation in theater plus deep strikes against Red nuclear delivery means, conventional escalation outside

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\(^\text{14}\)In both Cases A and B, Operation Red Destiny was the code name for operational plans to secure key objectives in Azerbaijan and Georgia and to prevent or defeat external intervention.
the theater, theater use of nuclear weapons, and nuclear strikes against the Red homeland. They were torn between aversion to nuclear warfare and unwillingness to let Red profit from its action.

Analysis and Discussion

In a comparable real-world situation, the United States would anticipate possible nuclear use and take great care to avoid it. During the Cuban missile crisis, the United States decided not to invade Cuba, in large part because it thought the Soviets might resort to nuclear weapons. During the last Berlin crisis, the Soviet Union decided to allow U.S. convoys to proceed, presumably because it wished to avoid escalation. During the Korean War, the United States limited its military options (for example, not attacking targets inside China) in part due to the possibility of the Soviet Union employing nuclear weapons in support of its allies. Considering this history, it is doubtful whether the United States would try to conduct a conventional campaign against a major nuclear power in a region contiguous to its homeland. But if it did, there would be important implications.

Before conducting a campaign the United States would have to consider how to deter use of nuclear weapons and how to respond if deterrence failed. It would have to consider the likely effects of nuclear weapons on its allies and on its forces in theater. It would have to consider what nuclear guarantees, if any, to give its allies. It would have to consider how best to protect its forces in theater from the effects of nuclear weapons. U.S. forces deployed in theater would have to take measures to reduce their concentration, survive nuclear use, and recover following a strike. The game highlighted the need to assess under what conditions a nuclear-armed opponent would resort to the use of that class of weapon. Such an assessment could help determine whether attempting to preclude this type of opponent is feasible.

Although Blue players were deeply concerned about possible nuclear use, they did not explore the topic thoroughly. They did not adequately plan for the possibility that Red would try to avert conventional defeat by resorting to nuclear weapons. This failure may simply reflect time pressure on Blue players. 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

Research Questions

*How could the United States degrade an opponent’s access to spaced-based intelligence, surveillance, and reconnaissance (ISR)? How will rapid expansion of commercial space assets affect national ability to control space? What are the implications for terrestrial operations?*

The United States would want to deny an opponent access to space-based ISR while retaining its own access, but an all-out space war might blind both sides. An all-out space war would usually benefit an opponent, but under some circumstances the United States might benefit. Moreover, the United States and its allies might not be able to control commercial space assets except at the price of disrupting their own economic life.

Game Play: Escalation of Conflict in Space

**Space Game.** During the Space Game, Red and the Commercial Team both adopted a policy of unconstrained access to space during conflict. Red saw this policy as the best way to keep access to commercial systems. The Commercial Team adopted this policy to assure physical survival of space assets and also to preserve normal contractual relationships, which it hoped to continue despite the conflict. In contrast, Blue wanted to obtain a unilateral advantage in space and tried—with little success—to restrict Red access to com-

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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.

Also during the Space Game, Blue wanted to know how commercial routing was accomplished so it could assess risk to communications and data that were transmitted commercially. The Commercial Team responded that their companies used optimal routing algorithms for most efficient operation and therefore routing changed frequently. As a result, neither Blue nor Red would normally know what routing was in use at any given time.

**Spring Wargame.** During the SWG, both Blue and Red forces supported their operations through space-based ISR, but the relative importance of space-based assets varied over time. Initially, Red avoided offensive operations in space because its space-based assets were vulnerable and critically needed to observe Blue’s deployments into theater. But after Blue forces reached theater, Red could observe Blue forces using ground and aerial systems, so that space-based systems became less important to Red. For Blue, the situations were reversed. During deployment, Blue had relatively less need for space-based systems, but they became crucial during operations in theater. Given Blue’s greater capacity to reconstitute military space assets, Blue might better have opted to initiate space war earlier rather than allow Red to initiate it later.

Blue enjoyed a substantial advantage in military space-based assets. However, Red had enough military assets to satisfy its basic needs as well as access to commercial satellite services. Blue undertook several efforts to degrade Red’s space-based ISR. It used dazzlers in theater to degrade Red’s military system and tried unsuccessfully to persuade commercial corporations that they should delay transmission of space-derived products to Red by 24 hours.

In move 3, Red employed direct ascent anti-satellite weapons and ground-based lasers (GBL) against Blue space-based lasers (SBL). Red hoped to inflict enough damage on the SBLs to allow Red to launch ICBMs and its space plane. Red ICBMs were to attack AEF operating bases and storage sites in theater. The Red space plane was to attack high-value targets in Europe and the CONUS. Red had only limited success against the Blue space-based laser, and Red
attacks on terrestrial facilities caused only marginal degradation to Blue capabilities. In response, Blue destroyed most of Red’s military satellites.

Analysis and Discussion

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. Moreover, uninterrupted service might be vital to economic life. In view of these difficulties, an opponent might have at least some access to commercial systems during a conventional military campaign.

The implication for all military services is that information dominance could be incomplete due to commercial access by an opponent. However, the United States could degrade and distort this access by spoofing and jamming on a theaterwide basis.

SEA CONTROL

Research Questions

*How quickly and completely could U.S. and coalition forces gain sea control against a major competitor? How would sea control affect operations in theater?*

The United States is accustomed to operating freely throughout the world’s oceans. But in some future conflict, the United States might need to gain sea control very rapidly in constricted waters against an opponent with modern weapons. For example, the United States arbitrarily restricted its operations in the northern Persian Gulf during Operation Desert Shield and suffered damage to sea mines later.

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16This issue relates to the following AAN theme and objective: “8. Joint Operations/Interdependence: a. What tasks will the Army depend on other services or governmental organizations to perform?” *Study and Research Plan, Annex A.*
Game Play: Battle of the Black Sea

Prior to D-day, Blue aircraft carriers had not passed the Turkish Straits, but Blue had six Los Angeles–class attack submarines in the Black Sea when Red began its attack. In a three-day Battle of the Black Sea, Blue gained almost complete sea control over Red. Between H-hour and H-hour+6, Blue attack submarines largely destroyed a Red surface action group (SAG) and a separate Red amphibious task force bound for Poti. They quickly sank four Moskva-class cruisers, three Soveremeny-class destroyers, five amphibious assault ships, and two support ships. They left one Tbilisi-class carrier and one Kirov-class cruiser dead in the water. Only a few smaller vessels escaped because they were in water too shallow for effective torpedo attack.

During the first two days of combat, Blue B-2 bombers and Naval Tactical Missiles (N-TACMs) also sank ten Red XXI Century–class frigates in the Sea of Azov. These frigates each fired about 1,700 rounds through their railguns against targets in northern and eastern Turkey before being destroyed.

Game Play: Impact of Sea Control

Control of the Black Sea allowed Blue to extend its defense of Turkish air space, to eliminate Red sea-based systems capable of firing into Turkey, to prevent a Red amphibious assault on the Georgian littoral, to protect its sea lines of communication (SLOCs), and to conduct its own amphibious assault.

Blue used the Aegis system and carrier-based combat air patrols to strengthen its defense of APODs and SPODs in Turkey. Blue submarines completely defeated a Red attempt to land naval infantry near Poti. Blue naval forces supported forced entry and arrival of follow-on forces through an assault north of Poti and the seizure of

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17The XXI Century–class frigate was a notional general-purpose vessel equipped with anti-ship missiles, anti-submarine weapons, and several guns. Each mounted one railgun that could deliver a 150-pound GPS-guided projectile up to 400 nautical miles at a rate of six rounds per minute. U.S. Department of the Army, Army After Next Spring Wargame 1999, Foreign Systems: Federation of Eurasian States, Headquarters, U.S. Army Training and Doctrine Command (prepared by Booz-Allen & Hamilton under contract), Fort Monroe, VA, 1999, p. 23.
Batumi. As the campaign progressed, Blue naval forces provided sea-based fires in support of operations on the Georgian littoral and continued to protect the deployment of forces from east coast U.S. ports all the way to the area of operations.

Fundamental to naval play in the game was the assumption that the U.S. Navy would be willing and able to send large numbers of its ships and submarines, including amphibious ships carrying thousands of troops, into the constricted waters of the Black Sea. In addition, assessors assumed that Red would have little capability to protect its surface ships and shore bases. For example, the rapid destruction of Red’s XXI Century frigates in the Sea of Azov was largely due to a relatively small number of missiles launched from the Blue attack submarines in the Black Sea. No missile defenses of the Red Azov base were played, nor were Red’s ships credited with point defense capabilities.

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.

**Analysis and Discussion**

Game play may have made sea control appear unrealistically easy. In a real-world situation, the U.S. Navy might well hesitate to deploy large surface forces quickly through the Turkish Straits and into the Black Sea against a major power with modern air and sea forces. Game play may also have underestimated the difficulty of launching a large-scale amphibious assault at short notice. It appears more plausible that U.S. attack submarines could quickly destroy opposing surface vessels, even within enemy territorial waters. It is interesting to note that in SWG-98 a far less capable opponent had at least as much, if not more, success in disrupting Blue naval operations.

Game results underscored the critical importance of early sea control, especially in littoral warfare. Littoral warfare is of primary interest to the Marine Corps, but the Army is also interested. For example, light Army forces might operate again from an aircraft carrier as during the September 1994 intervention in Haiti.
AIR SUPERIORITY

Research Questions

*How quickly and completely could U.S. and coalition forces attain air superiority against a major competitor? How would air superiority affect operations in theater? How could the Army best contribute to 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.

Game Play: Establishing Air Superiority

Blue urgently needed to attain air superiority over Turkey to shield APODs and SPODs, which it required to build up decisive force in the theater. Within a week to ten days, Blue needed air superiority over the Black Sea and the Transcaucasus to interdict the advance of Red forces and to support its own offensive operations.

At the outset of hostilities, Blue had two aircraft carriers and one AEF plus point air defenses in theater and Turkish air forces. Red had a large, modernized air force, but it was hopelessly outclassed by Blue and therefore largely ineffective.

Red used every available means to attack Blue’s APODs and SPODs, including special operations forces, fixed-wing aircraft, medium-range ballistic missiles, cruise missiles, chemical weapons, long-range naval gunfire (railguns fired from XXI Frigates in the Sea of Azov), information operations, and conventionally armed ICBMs launched from Red’s homeland.

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18This issue relates to the following AAN themes and objectives: “2. Force Projection: How can critical force projection assets be protected? 8. Joint Operations/Interdependence: a. What tasks will the Army depend on other services or governmental organizations to perform? b. What interdependencies and/or redundancies must be maintained?” Study and Research Plan, Annex A.
Where Blue had deployed ballistic missile defenses, it destroyed almost all incoming Red missiles. Blue was more vulnerable to cruise missiles. At the outset of the campaign, Red had very large numbers of cruise missiles, enough to sustain massive attacks on APODs and SPODs for several weeks. Red’s bomber-launched missiles had ranges up to 3,200 kilometers and flew 15 meters above sea level as they approached the northern Turkish coast.

As a result of Red attacks, Assessment delayed the flow of Blue forces by two or three days and caused Blue to experience some supply shortages. From the Red perspective, this outcome was simply a defeat of Red’s efforts to deny entry into the theater. In accordance with Red planning, Assessment decided that Red would employ chemical weapons about a week into the campaign, causing reduced sortie rates from some bases and a brief delay to arriving Blue forces. But despite these delays, Blue rapidly introduced three more AEFs and extended its air superiority to the Transcaucasus.

Red had large numbers of modern SAMs assigned from brigade-level through Strategic Direction (the Red equivalent of a regional combatant command), but these caused few Blue losses. Exploiting air superiority, Blue inflicted significant losses on Red ground forces advancing in columns through the Caucasus Mountains and supported early entry of Blue ground forces on the Georgian littoral and in southwestern Azerbaijan.

Red took special precautions against air operations of Blue Battle Forces. It deployed teams with man-portable air defense missiles and employed anti-helicopter mines to destroy Blue’s super short takeoff and landing (SSTOL) aircraft and JTR. At first, these measures had little effect, but by game’s end Assessment credited Red with destroying significant numbers of these aircraft.

**Game Play: Countering Cruise Missiles**

During the SWG, cruise missiles constituted Red’s most significant challenge to Blue air superiority. Red had a total inventory of about 20,000 fairly accurate, long-range cruise missiles. Red preferred to deliver cruise missiles by bombers flying outside the range of Blue’s ground- and sea-based air defenses and beyond the patrol range of Blue’s sea- and land-based fighters. On the first day of the campaign,
Red fired roughly 1,000 cruise missiles against ports, airfields, air defense sites, and key command and control nodes in Turkey, Azerbaijan, and Georgia. Red was credited with being able to sustain a rate of approximately 500 cruise missile launches per day well into the second week of the war. Although Blue’s defenses shot down 85–95 percent of incoming missiles, sufficient numbers leaked to inflict damage on several seaports and airfields.

Due to the cruise missile threat, AEF 3 and AEF 4 were initially diverted to Greece and Italy, reducing their sortie rates, while incoming transport aircraft had to land in western Turkey. In Case B, Red focused its ISR capability on locating the 101st Air Assault Battle Force (AABF). After locating the 101st AABF’s assembly areas, Red launched a cruise missile barrage, which destroyed some 60 JTRs on the ground. Blue responded by expanding its air defense umbrella across the Black Sea, reinforcing its point defenses of key locations, flying additional combat air patrols, and attacking bomber bases in the Red homeland. The overall effects of Red’s cruise missile capability were to degrade Blue air operations, delay the arrival of follow-on forces, and, to a lesser extent, threaten some Battle Forces. Cruise missile attacks continued up to the end of the game, although in reduced numbers.

The effort required to suppress Red surface-to-air missile units was not adequately addressed in the game. Red was credited with numerous brigades of SA-10, -12, and -15 SAMs, all upgraded to 2020 standards. The number of SAM brigades deployed to Red’s Southwest Strategic Direction would have resulted in very dense air defense coverage. All the SAMs listed here include anti-missile capability in addition to their ability to engage aircraft.19

**Analysis and Discussion**

Air superiority implies dominating every means of affecting combat outcomes through aerial vehicles.20 Assuming that current pro-

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20The U.S. Air Force defines air and space superiority as “control over what moves through air and space” and observes that “Defense against ballistic and cruise missiles
grams, including the F-22, reach fruition, even major competitors will be unable to contest air superiority against the United States in aircraft-on-aircraft engagements. As a result, potential opponents may shift their emphasis to ballistic and cruise missiles. Cruise missiles currently are expensive and therefore limited in numbers, even for U.S. forces. But progress in microprocessing might reduce cost so that a major competitor could afford to acquire thousands of advanced missiles, thus posing a significant threat against deploying U.S. forces. To counter this threat, the United States and its allies would probably require a mixture of offensive and defensive measures. They would have to suppress and destroy opposing cruise missile carriers. They would have to maintain integrated, layered air defense umbrellas incorporating air-to-air and surface-to-air systems. Terrestrial point targets might require terminal defenses comparable to those deployed on naval vessels.

The number of cruise missiles that Red was credited with was a point of some discussion at the game. Some participants contended that 20,000 cruise missiles was too large a number. That number was based on an assumption by the designers of the Red forces that the cost of cruise missile technology would come down in the future. In any case, the effectiveness of Blue TMD was assessed at such a high level that the potential effect of the large Red cruise missile inventory was dramatically reduced.

Game play may have underestimated the time and resources required to suppress modern air defenses, especially nonemitting systems capable of engaging aircraft at low to middle altitudes. Even so, losses of SSTOL and JTR were large enough to merit further investigation. To operate successfully within the envelope of opposing air defenses, the Army would have to develop ways of suppressing or evading these air defenses. Currently, U.S. forces can reduce the effectiveness of emitting systems through electronic countermeasures and destroy or suppress radars by anti-radiation missiles, but they remain vulnerable to nonemitting low-level air defense

systems, including air defense artillery and missiles with passive seekers and anti-helicopter mines.

SUSTAINMENT

Research Questions

_How can the United States assure sustainment of forces in a quickly developed theater? What sustainment concepts would be optimal for Battle Forces?_\(^2\)

In some future conflict, the United States might have to enter a contested, relatively undeveloped theater with constrained logistics support. Sustainment might be especially difficult for land forces operating in considerable depths and at high tempos.

Game Play: Sustaining Joint Forces in Theater

During the SWG, Blue had to deploy forces long distances from the continental United States (CONUS). As these forces arrived in theater, Blue had to sustain them by airlift and sealift at the end of very long lines of communication. Timely sustainment was critical to maintaining the high operational tempo required to retain the initiative and to attain strategic preclusion. Red had much shorter distances to overcome but was vulnerable to interdiction, especially in the narrow passes through the Caucasus Mountains and coastal roads along the Black Sea and Caspian Sea littorals. Red realized that it would be at a disadvantage if Blue could deploy and sustain large forces in theater. Therefore, Red conducted an all-out attempt to keep the Blue forces out of theater, concentrating on APODs and SPODs in Turkey.

Red used every means at its disposal to delay the arrival of Blue forces, including

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\(^2\)This issue relates to the following AAN theme and objectives: “3. Sustainment: b. How do various logistic concepts to include swarms, caches, and robotic forces impact military operations? e. What are the sustainment challenges with AAN-era hybrid force entry operations? i. What are the implications of emerging medical organizational and operational concepts on seamless integration of health support?” _Study and Research Plan, Annex A_.

• Sea mines in the Black Sea prior to D-day
• Submarine attacks in the Atlantic and Mediterranean
• Information operations (IO) in CONUS
• Attacks on APODs, SPODs, and petroleum stocks in Turkey
• Special operations
• Long range naval fires—XXI Frigates with railguns
• Air-launched cruise missiles
• Ballistic missiles
• Lethal chemical weapons
• Electromagnetic pulse (EMP) weapons.

Blue conducted countermine operations prior to D-day and as a result suffered no significant damage to sea mines. Red submarines sank several ships and Red IO in CONUS caused some delay in U.S. deployments. Red caused the greatest delay and disruption through its relentless attacks on Blue APODs, SPODs, and petroleum stocks throughout the theater. Red realized that Blue operations would require massive logistical support throughout the area of operations, particularly aviation fuel for the large numbers of SSTOL aircraft, JTRs, and attack helicopters. Consequently, Red focused its attacks on Blue’s sustainment operations. By move 3, a shortage of fuel compelled CJEF-B to pause operationally.

**Game Play: Sustaining Battle Forces in Combat**

During the SWG, Blue CJEF commanders initiated offensive operations on land as soon as air superiority was achieved. Battle Forces soon operated far forward of their logistical bases. The most difficult resupply problem was fuel, especially fuel for the aircraft supporting Battle Forces. Even assuming that sufficient stocks were available in Turkey, distribution problems slowed the tempo of operations.

Battle Forces were assumed to be self-sustaining for 48–72 hours of independent operation, apart from aviation fuel. After this time expired, Battle Forces had to either be resupplied in place or rotate out of the battle area. Moreover, Battle Forces have minimal organic
logistical support. Therefore, 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.22

Analysis and Discussion

In all likelihood, future Army forces will still depend on logistical support delivered through APODs and SPODs, which could be vulnerable to air attack, special operations, and terrorism. Against such opposition, the United States would require an effective theater missile defense, a difficult technical problem to solve.

Chemical weapons would also pose significant challenges. 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 that embraced not only military units but also the civilian work force.

Battle Forces have a notional tempo of operations significantly faster than current Army forces and farther from their support bases. Sustaining these operations poses enormous challenges, especially if an enemy has air defense weapons that could threaten aerial resupply. Rotation of Battle Forces for resupply appears impractical, but it is not clear what alternative concepts should be pursued.

Given the limited ability to assess logistics details during the game, sustainment issues tend to focus on bulk consumables such as fuel and ammunition. In actual operations the rapid availability of critical low-density spares could have a significant influence on operations. Certain medical supplies such as blood may have a similar effect.

In general, the AAN force appeared to be operating on the edge of sustainability. Even given the generous lift and host nation assump-

tions that permitted very early initiation of ground offensive operations, the forces eventually reached their logistics culminating point and had to dramatically reduce their tempo.

**URBAN TERRAIN**

**Research Questions**

*How might U.S. and coalition forces operate in urban and complex terrain? How could the Army best contribute to operations in urban terrain? What roles should Battle Forces have?*

This issue emerged in earlier AAN games when Red forces evaded Battle Forces by rushing into urban terrain. Based on this wargaming, TRADOC identified these options for handling urban terrain:

**Option 1:** Preempt or deny enemy occupation.

**Option 2:** Bypass the urban area.

**Option 3:** Contain but not destroy the enemy within the city.

**Option 4:** Reduce enemy forces by standoff strikes, if collateral damage is acceptable.

**Option 5:** Seize the area using U.S. and allied forces.

**Game Play: Situations Involving Urban Terrain**

During the SWG, Blue players were confronted with several situations that involved urban areas. In each case, the CJEF commander made an operational decision he considered appropriate to the situation.

Some Red forces remained in Poti, a Black Sea port that Blue originally intended to seize and use as an SPOD. Rather than accept ur-

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23 This issue relates to the following AAN theme and objectives: “5. Urban/Complex Terrain: a. What are the critical limitations and vulnerabilities associated with employment of AAN-era forces in large urban areas? b. What operational concepts, organizations, and capabilities should be used during the employment of AAN-era forces in large urban areas?” *Study and Research Plan, Annex A.*

ban combat, Blue bypassed Poti and seized Batumi instead (Option 1).

Red forces withdrew into Tbilisi, a city that dominated the east-west LOC through the Transcaucasus. Both Blue CJEFs needed this LOC to link their heavier forces in the west with light and medium-armored forces in the east. These lighter forces were supplied almost to game’s end solely through an air bridge that Red was assessed as being unable to disrupt. Blue, however, avoided protracted urban combat in Tbilisi. Instead, Blue employed U.S. and Turkish forces to seize just that part of the city, generally south of the Kur River, needed to establish a LOC (Option 2 or Option 3, modified).

In both Case A and Case B, Blue commanders cleared parts of Tbilisi during the last move with relative ease, even though the Red 12th Corps had ample time to consolidate its position in this city. Moreover, the Red 12th Corps was one of the strongest in the Red order of battle and included units specialized in urban combat. In the real world, operations of this kind might be significantly more difficult.

Larger and more combat effective Red forces remained in Baku, the Baku peninsula, and offshore oil facilities near Baku. In Case A, Blue SOF recovered most of these oil facilities. The commander of CJEF-A cancelled planned airdrops in the Baku area when reconnaissance revealed that they were too risky. In Case B, Red forces began to destroy as many oil facilities as they could. In both cases, Blue forces contained Red forces in Baku (Option 3).

**Game Play: Requirements for Urban Operations**

**AMEDD Game.** During the AMEDD Game, the panel noted that in urban operations there would probably be casualties caused by eye wounds, inhalation, electrical shock, and ricochets, as well as stress-related problems. The panel thought that challenges would include preparing first response, locating casualties, extracting casualties from rubble, and conducting casualty evacuation. It recommended development of new technologies to solve problems of extracting and evacuating casualties. The panel also noted that urban combat could produce noncombatant casualties in large numbers. A theater commander would have to respond to such a disaster by integrating his own efforts with a larger international response, which would
include efforts by coalition partners and other concerned countries, international organizations, and nongovernmental organizations.

**Spring Wargame.** The game suggested that almost any unit might suddenly be forced to conduct operations in urban terrain. The LMBF, the only Battle Force optimized for urban combat, was not employed because it had not reached key urban areas before game’s end. When urban operations were required, units in the immediate vicinity were tasked to perform the mission. Based on this result, the Army should consider preparing all its early arriving forces to conduct urban operations if required.

**Analysis and Discussion**

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 exception is the LMBF, which is optimized for urban operations, but it was not employed in this way during the SWG. By contrast, coalition forces with U.S. support might be highly effective in urban terrain. Players thought that operational commanders should consider alternatives to urban combat but undertake them when required by the military situation or directed by higher authority for political reasons, such as recovery of an allied capital.

**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

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25The Light Motorized Battle Force was a “niche enabling force for complex terrain” able to conduct “operations over large urban areas, in mountains and jungles and over areas of mixed terrain.” U.S. Department of the Army, *Army After Next Spring Wargame ’99, FY99 National Operational Forces and Illustrative How to Fight Concepts and Capabilities*, U.S. Army Training and Doctrine Command, Fort Monroe, VA, 1999, Slide 9. It was an 11,200-man force built around six 1,084-man infantry regiments, each having 13 Armored Scout Vehicles and 48 Advanced Combat Vehicles (ACV). ACV were an armored family of vehicles with combat weights of approximately 8 tons. The combat version was armed with 30mm guns and miniaturized line-of-sight/non-line-of-sight missiles. It carried a crew of two plus nine infantrymen.
very limited utility. Long-range precision fires would encounter severe problems of masking.

It should be noted that enemy actions and political mandates could require a difficult urban fight by U.S. forces. For example, in this scenario Baku and Tbilisi had great political significance. This could have led to politically motivated requirements to engage in urban operations. This highlights the need for a comprehensive joint approach to the strategic, operational, and tactical issues associated with urban operations.

**REFUGEES DURING CONFLICT**

**Research Question**

*How could the United States and its allies cope with massive flows of refugees during conflict?*

During World War II and the Korean War, U.S. and allied forces often had to cope with large flows of refugees. Indeed, several of today’s foremost humanitarian agencies, such as the United Nations High Commissioner for Refugees (UNHCR), are a response to conditions created by World War II. Recently, the United States has addressed problems of refugees in such places as Somalia, Rwanda, Bosnia, and countries bordering Kosovo. Since the Korean War, however, the United States has not had to conduct large ground combat operations while simultaneously handling problems posed by refugees. In the recent Kosovo crisis, for example, refugees fled the province during an air operation and largely returned home when ground operations began. But some future contingency might pose both requirements simultaneously.

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26This issue relates to the following AAN themes and objectives: “1. Strategic Setting: b. What are U.S. vulnerabilities (military and civilian) to asymmetric threats during all phases of military operations, in theater and external to the theater? 9. Coalition Operations: c. What are the tasks that the military depends on civilian and coalition organizations to perform in response to this crisis? e. What tasks is the Army expected to perform for civilian and coalition partners in this crisis?” *Study and Research Plan, Annex A.*
Game Play: Massive Outpouring of Refugees

Red’s invasion of Azerbaijan and Georgia provoked a massive outpouring of refugees. The operational area included several large urban areas, particularly Tbilisi and Baku, where fighting would likely displace people. Moreover, Red deliberately displaced civilians in the expectation of hampering Blue operations. Refugees quickly clogged the region’s limited road net and caused a massive humanitarian emergency. Blue had to respond to this emergency while still involved in combat operations against Red.

Initially, Blue players tended to see refugees as a distraction from their combat mission. But by the final game move, CINCWEST realized that he had to solve the refugee problem for both moral and operational reasons. Morally, Blue could not ignore the plight of thousands of civilians uprooted by a war Blue was fighting out of geopolitical calculations. Operationally, Blue had to assure that roads and other transportation infrastructure remained available for military use.

CINCWEST promulgated the following guidance on refugees: The CJEF commanders would not divert forces from combat missions to aid refugees. They would help create safe areas for refugees in the areas of Poti, Lenkoran, and Goradiz. They would assign coalition assets to humanitarian missions whenever possible and coordinate efforts with international organizations, nongovernmental organizations (NGOs), and the Azerbaijan and Georgian governments in exile. The CJEF commanders found that they had very limited capability to support humanitarian assistance. Therefore, they adjusted Time Phased Force Deployment Data (TPFDD) for the final phase of the campaign to include more civil affairs (CA) assets and additional combat service support (CSS) units.

Game Play: Impact on Operations

The magnitude of the refugee problem hampered Blue operations. Initial deployment of Blue forces was heavily biased toward combat units. As a result, support units were in short supply, and the CJEF commanders initially lacked resources to address the refugee problem.
By game’s end, there were some 200,000 refugees in the Poti-Batumi area alone. In the entire area of operations the refugee count would presumably have been much higher. Additionally, many of the refugees had been subjected to Red’s use of biological agents, resulting in widespread illness among the huge numbers of displaced persons. Blue had to assist refugees while it was simultaneously conducting combat operations. Moreover, the problem became acute just when Blue’s own logistics structure was strained by the high tempo of operations. Coordination was difficult due to the large number of organizations involved in relief efforts, including allied nations, host nations, international organizations, and NGOs.

Analysis and Discussion

If current trends continue, the world’s population will become larger and more heavily concentrated in urban areas. Future combat operations conducted near heavily populated areas may generate large numbers of refugees, who will impede military operations and require humanitarian assistance. Requirements for assistance may drain military resources, particularly in areas close to combat zones, where civilian relief agencies are not yet established. All 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

Research Questions

How might a future Objective Force achieve air mobility? How could the United States reduce the vulnerability of SSTOL aircraft and JTR? How should SSTOL aircraft be allocated?\textsuperscript{27}

\textsuperscript{27}This issue relates to the following AAN theme and objectives: “4. Hybrid Force Employment: i. Which air delivery means (STOL, SSTOL, VTOL) provides significant increases in vertical envelopment capability of middle weight forces? q. What are the survivability implications of the theater air transport alternatives for the FY99 AAN notional battle forces (C-130, SSTOL, JTR)?” Study and Research Plan, Annex A.
In Operation Allied Force in Kosovo, the United States almost always flew above the effective ranges of anti-aircraft artillery and man-portable missiles. But to realize the AAN FY99 Battle Force concept, supporting aircraft would have to fly within range of such systems, making their survivability an issue. If the Army develops forces to exploit SSTOL assets maintained by a sister service and centrally controlled, allocation of these assets would become an issue.

**Game Play: Vulnerability of SSTOL and JTR**

In AAN SWG-99, Blue inserted Battle Forces using Air Force SSTOLs and Army JTRs. Allied air assault units self-deployed using organic rotary-wing aircraft. Even after Red fixed-wing aircraft had been driven north of the Caucasus, Red could still disrupt SSTOL and JTR operations using land-based air defense systems and special-purpose mines. On several occasions, Red inflicted large losses to JTRs and SSTOLs through low-altitude air defenses. On one occasion, Red conducted a massive cruise missile strike on assembly areas of the 101st AABF, causing significant casualties.

**Game Play: Allocating Airlift Sorties**

The Air-Mobile Battle Force (AMBF) was deployed differently in Case A and Case B due to decisions about allocation of SSTOLs.\(^28\) In Case A, the AMBF deployed from CONUS on USAF SSTOLs dedicated to that mission. As a result, the AMBF was available for an air assault into Agnan early in the campaign. But in Case B, Assessors decided that SSTOL-equipped wings would have to carry their own support equipment into Turkey on their first sorties and that they could not be used to lift Army forces until their support was in theater. Therefore, in Case B the AMBF had to deploy to Turkey aboard fast ships. Once it arrived in theater, SSTOL aircraft gave it an air assault capability.

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\(^{28}\)The Advanced Theater Transport (ATT) was an SSTOL transport aircraft capable of combat delivery of a 30-ton payload into austere landing sites. It required at least 750 feet of runway.
In Case B, the 101st AABF conducted an air assault into Agnan. Its mission was to defeat the heavy Red 8th Corps, which was in defensive positions around Agnan. The 101st AABF, together with elements of the 82nd Light Airborne Battle Force (LABF), accomplished this mission but suffered approximately 25 percent casualties.

Analysis and Discussion

When airborne in forward areas at low altitude, SSTOL and JTR are vulnerable to ground-based air defenses. When on the ground, they are vulnerable to attack by ballistic and cruise missiles. 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 those 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. Within continuing study and gaming efforts, TRADOC should sponsor more detailed assessment of insertion tactics.29

The AMBF concept required strategic airlift into theater and operational-level air mobility. Strategic airlift implies any transport aircraft capable of lifting 30-ton vehicles (C-5, C-17, and C-141). Operational-level air mobility implies an extremely robust aircraft, such as SSTOL, capable of landing on short (750-foot) and unimproved strips. For both missions, an AMBF-like force would have to compete for SSTOLs with other demands on available inventories. 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

Research Question

*How could survivability of the Objective Force be enhanced?*

AAN FY99 Battle Forces were light- to medium-weight forces deployed (with one exception—the MABF) by air and maneuvering by air within theater. Like all such forces, they trade passive protection for mobility, causing their survivability to become an issue.

Game Play: Alternative Battle Forces

During the first two years of the AAN process, the Battle Force was configured exclusively as an air-mechanized force, i.e., light armored vehicles combat-delivered by organic tilt-rotor aircraft. While this force had operational advantages in mobility and firepower, it lacked passive protection and could be vulnerable to air defenses. Modern air defenses could severely limit employment options for this Battle Force due to the vulnerability of its tilt-rotor transport aircraft.

In the third year of AAN, the spectrum of Battle Forces employed various deployment methods. LABF could airdrop or airland, depending on the situation. LMBF would normally airland using strategic airlift. AABF could self-deploy using organic JTR aircraft. Its 8-ton Advanced Combat Vehicle (ACV) had even less protection than the 15-ton combat vehicles used by an air-mechanized Battle Force in preceding years. AMBF would normally deploy in USAF-operated SSTOL aircraft. Finally, MABF would normally deploy by fast sealift. (The only major difference between AMBF and MABF was the deployment mode.) Thus, two of the third-year Battle Forces deployed by air into the forward area, typically in close proximity to opposing forces: AABF by JTR and AMBF by SSTOL. These two forces continued to embody the air-mechanized concept that domi-

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30This issue relates to the following AAN theme and objectives: “4. Hybrid Force Employment:  j. What are the mobility, survivability, lethality, and sustainability implications of light and medium armored vehicles between 4 and 30 tons? r. What are the feasible survivability expectations/limitations of future ground vehicles between 4 and 30 tons, based on the notional ground systems in the FY99 AAN notional battle forces?” *Study and Research Plan, Annex A.*
nated the first two years of the AAN process. The critical difference between these two forces was airlift: AABF had organic JTRs, while MABF had to rely on allocation of SSTOL aircraft. For these two forces, survivability of lift assets continued to be a major issue.

**Game Play: Situations Stressing Survivability**

Battle Forces had to operate in a variety of situations that stressed survivability. They had to be survivable both while operating on land and while conducting aerial maneuver.

The situations that provided useful insights on survivability were (1) the air movement of Battle Forces (e.g., the 82nd LABF air assaulting to the area around Tbilisi and the 101st AABF and 11th AMBF attacking Agnan and later the valley northwest of Baku), (2) the battle near Agnan between elements of the various Battle Forces (AMBF in Case A and AABF in Case B) and the Red 8th Corps, and (3) the urban battle in portions of Tbilisi. The air movements highlighted the need for suppression of enemy air defenses and aircraft survivability. The Agnan battle pitted light- to medium-weight AAN forces (the 11th AMBF with its 26-ton combat vehicles in Case A or the 101st AABF armed with 8-ton vehicles in Case B) against the Red 8th Corps defending in mixed terrain. This engagement points to the need for survivability against enemy direct- and indirect-fire systems in close combat.

CJEF-B attacked into Tbilisi to establish a LOC linking forces in Georgia with forces in Azerbaijan. During this battle, two U.S. Army XXI brigades, a Strike Force, a MABF, and UK forces attacked a large urban area against well-prepared opposing forces. These Blue forces had to survive in close engagements and against indirect-fire systems that Red employed from inside the city. To operate effectively in this environment, Blue degraded Red C4ISR and hence Red’s ability to target Blue forces.

**Analysis and Discussion**

The game suggested that the Battle Force–type units should 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. By seeking the best way to integrate future Objective Force operations with joint forces and Army XXI capabilities, the potential vulnerabilities of AAN-type organizations could be minimized. Finally, survivability may be significantly improved by degrading the enemy’s C4ISR systems.

**TRAINING BATTLE FORCE SOLDIERS**

**Research Question**

*Will AAN-type operations require new kinds of training for Army soldiers?*

Several AAN Franchise Games highlighted the issue of training the future soldier. The higher operational tempo, dramatic increase in unit dispersion, and more flexible tactics envisioned may require new approaches to training soldiers and leaders.

**Game Play: Future Training Options**

**ARSOF Wargame.** During the ARSOF Wargame, Blue players wondered if emerging technologies would simplify warfare so that human factors would make less difference than they currently do. They generally agreed that human factors would remain important and might make an even greater difference. As an example, they noted that during the American Civil War eight artillerymen could fire several shots per minute from a cannon with very limited destructive force, range, and accuracy. By contrast, during the recent Persian Gulf War, just three artillerymen using the Multiple Launch Rocket System could deliver devastating, long-range, highly precise fires. But these three artillerymen required far more intensive and sophisticated training than their counterparts in the Civil War. Moreover, their skills were more perishable and required constant refreshment.

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31This issue relates to the following AAN theme and objectives: “6. AC/RC Integration: b. For what areas of specialization and to what degree would AC and RC forces be best suited? c. What are the requirements for RC Units to contribute to a rapidly deployable force?” *Study and Research Plan, Annex A.* It also relates to Training, one of the six Army Imperatives (Doctrine, Training, Leader Development, Force Mix, Modern Equipment, Quality People) included in the FY99 AAN process.
AMEDD Game. During the AMEDD Game, the panel thought that future medical units might be joint and also blend staff from a variety of sources, including personnel from U.S. reserve components, allied countries, and nongovernmental organizations. If so, there would be important issues regarding training and standards of care.

Spring Wargame. AAN SWG-99 highlighted a need for the Army to consider training implications associated with Battle Force operational concepts. Battle Force operations are highly dispersed over large geographic areas and conducted at very high operational tempo. When Battle Forces arrive in their objective areas, various elements and even individual vehicles would be far more dispersed than are today’s forces. As a result, many junior enlisted leaders would be kilometers away from more senior leaders or even the next friendly vehicle. The generally lower level of combined arms operations, for example individual fighting vehicles having both direct- and indirect-fire capabilities, will place new demands on crew training to ensure that weapons are used appropriately and their effects are properly coordinated. When Battle Forces strike deeply into enemy-held territory, the nearest medical facilities might be hundreds of miles away, thus posing new challenges in terms of immediate medical care to wounded and their subsequent evacuation.

Analysis and Discussion

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 long 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 now. For example, players in the medical franchise game foresaw a need for more highly trained enlisted medics due to the great depth and speed of Battle Force operations. The Special Forces practice of unsupervised individual initiative might become the norm for soldiers assigned to Battle Forces.
The highly dispersed nature of Battle Force operations would place a premium on small unit leaders and unit cohesion. As a result, current personnel rotation policies might require modification to facilitate the type of training and levels of cohesion that such units would require.

HYBRID FORCE EMPLOYMENT

Research Question

*How could disparate forces of a hybrid*[^32] *Army achieve the greatest synergy?*

In 2022, the Army will include both Army XXI forces and new types of forces, which emerge from the Army Transformation processes. AAN SWG-99 was intended to “assist in developing an operational theory and organizational concepts for the entire hybrid Army force.”[^34]

[^32]: “Hybrid” implies disparate levels of modernization:

> Given the costs of modernization, the tyranny of developmental/acquisition timelines, and the unpredictability of technological breakthroughs, the fielding of a hybrid force is both unavoidable and entirely appropriate. However, the differences inherent within the Army of 2025 will likely be more pronounced and more visible than today due to the capability gap that will exist between elements of the force equipped with current and emerging (evolutionary) technologies and those equipped with leap-ahead technologies (revolutionary). The hybrid force of 2025 will be forged from a range of functions, force structures, and capabilities spanning 20–25 years, from modernized AOE organizations to AAN Battle Forces, each optimized for a specific set of missions and circumstances, but adaptable to meet a broad range of conditions.

[^33]: This issue relates to the following AAN theme and objectives: “4. Hybrid Force Employment: a. What operational concepts, structure, and inherent capabilities prove most useful in combat operations? Least useful? c. What are the strengths and limitations of the various campaign alternatives considered by the CINC? d. To what extent and in what ways will differences in speed and agility among AAN-era forces affect force cohesion and battlespace coherence? e. How are information operations translated into operational effects that contribute to campaign objectives? f. How will space-based operations contribute to the conduct of operations in 2020–2025? n. How do staffs employ these forces differently? The same? What are the outcomes of these employment scenarios?” *Study and Research Plan, Annex A.*

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 forces.

**Game Play: Hybrid Force Operations**

The game provided limited opportunities to examine the operations of a hybrid Army. Case A included Strike Forces and 11th AMBF, while Case B included Strike Forces and one example of each type of Battle Force (see Appendix C). In both cases, the major contribution of Army XXI units were in combat service support and theater missile defense. The game offered few opportunities to assess operations that combined Army XXI and future Army maneuver units. In general, coalition forces (which were assumed to be very capable, generally self-supporting, and available in considerable quantity) performed many of the roles that might be expected of U.S. Army XXI-type organizations. Relatively few Army XXI maneuver units entered combat by the end of game play in both cases. For example, in Case B only two Army XXI heavy brigades were in combat (near Tbilisi, where a Strike Force was also operating) at the end of the game. The main contribution of Army XXI maneuver units in Case A was to seize lodgments near Agnan in Azerbaijan to facilitate the subsequent arrival of the AMBF.

Part of the reason for the limited ability to evaluate the hybrid force was that Battle Forces, when combined with air, naval, and coalition ground forces, were assessed to be so overwhelming. Essentially, whenever Blue ground forces engaged a Red unit, whether in the open, in defensive positions, or in urban areas, Red was defeated, usually with very heavy casualties to Red. Whether Blue forces would have actually been this successful against the conventional forces of a major competitor remains an open issue. Based strictly on game play, there was little need for Army XXI maneuver units.

In Case A, there were few opportunities to assess the AAN ground force mix. During initial entry into Azerbaijan, U.S. Rangers and
elements of the 82nd Airborne Division seized the Agdam airfield and surrounding terrain, allowing the U.S. 11th AMBF to airland without opposition. Later, one brigade of the 82nd Airborne Division parachuted into the vicinity of Baku and linked with one regiment of the 11th AMBF operating west of the city. But the 11th AMBF operated in closer cooperation with German and British air assault brigades. Moreover, CJEF-A players tended not to dwell on land force operations because they were highly successful and presented few challenges other than resupply.

In Case B, the more futuristic force, there was little opportunity to gain insights on the hybrid force. The assessed potential of Battle Forces and coalition units, plus air and naval power, resulted in heavy losses to Red’s conventional combat force prior to the commitment of Army XXI forces. Indeed, in Case B only two Army XXI Heavy Brigades and a Strike Force managed to enter combat before the end of the game. It should be recognized, however, that the majority of the theater logistics and missile defense units would have been Army XXI type, and those organizations played a critical role in the campaign.

Analysis and Discussion

**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 Battle Forces were less successful, the role of Army XXI forces would have been greater.

In both cases, U.S. air and naval forces, elements of a MEF, Army Strike Forces, a small number of Army Battle Forces (just one AMBF in Case A), and coalition forces rapidly defeated a major competitor within the area of operations. The Battle Forces and their complementary coalition and joint forces proved capable of defeating Red with little assistance from Army XXI elements. This outcome would indicate that by employing Battle Forces, the United States could defeat a major competitor with much smaller but more capable land
forces. However, if the assessment process had concluded that the Battle Forces were less successful, the role of Army XXI forces would have been greater.

In addition, TRADOC posed several research questions associated with the hybrid force. These questions (in italics) and responses follow:

What operational capabilities and concepts appeared to provide the greatest or least utility in combat operations?

The great mobility of Battle Forces and other air-mobile units provided CJEF commanders with operational flexibility and allowed high operational tempo. But as noted above, survivability of supporting aircraft and feasibility of logistics support over great distances need further examination.

The concept that appeared to have the least utility in AAN SWG-99 was the optimization of one type of Battle Force (LMBF) for urban operations. When the CJEF-B commander had to conduct urban operations, he had insufficient time to deploy this optimized unit. Instead, he employed forces in the immediate vicinity of the urban area. If, as this example suggests, optimization is impractical, Army forces should be broadly capable of conducting operations in urban terrain.

How do staffs employ these forces differently? What employments are the same?

Once deployed, all Battle Forces enjoyed about the same success in defeating Red land forces. Staffs quickly understood that successful deployment equated with combat success. Therefore, AAN SWG-99 did not expose significant differences for employment of the Battle Forces, excepting the MABF because it was sealifted while the others were airlifted.

During the final game move in Case B, there was considerable discussion about which forces to employ in the assault on Tbilisi. Although the CJEF-B staff decided to use the forces at hand, it would
have preferred to use more-capable U.S. Army XXI and coalition heavy forces.35

*How are information operations translated into operational effects that contribute to campaign objectives?*

**IO Wargame.** During the IO Wargame, Blue used a “strategy-to-tasks”36 approach to plan IO in the context of a joint campaign. The planners started with operational objectives implied by the overall mission. They identified desired effects, general actions, and specific actions that would help attain these operational objectives. For the specific actions, they identified measures of effectiveness (MOE). In addition, they identified required intelligence support, preparatory actions, decision points, and associated risks. For example:

**Operational objective:** Protect deployed forces.

**Desired effect:** Reduce Red ability to interdict Blue Battle Forces.

**General action:** Deceive Red about Battle Force locations.

**Specific action:** Deploy SOF with multispectral imaging system to misrepresent Blue operations.

**Measure of effectiveness:** Percentage of Red sensors misidentifying Blue landing zones and pickup zones.

**Intelligence support:** Human intelligence on SOF insertion points.

**Preparatory actions:** SOF insertion.

**Decision point:** D+1.

**Associated risks:** Casualties to SOF teams; possible compromise (by inference) of actual landing zones and pickup zones.

As time permitted, Blue planners entered all this data into spreadsheets that linked IO and other joint operations in an integrated operational plan.

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35RAND Arroyo Center interview with the Case A J-3, conducted after the Tbilisi assault had been planned.

In contrast to the Blue top-down approach, Red took a bottom-up approach to IO. The Red commander challenged his staff to envision specific actions during each phase of operations. Red planners analyzed these actions according to the IO objective, battle space geometry, tools and means, MOE, and phase. For example:

**IO objective:** Affect Blue’s ability to decide and respond.

**Battlespace:** Main battle area (Azerbaijan and Georgia).

**Tools and means:** Insertion of “Trojan Horse.”

**Measure of effectiveness:** Delay in Blue response.

**Phase:** Post-D-day support.

**Spring Wargame:** Red and Blue continually tried to obtain an advantage through information operations. The implications for hybrid forces are not clear, but Battle Forces would be at much greater risk, especially during deep maneuver, if Blue could not attain a substantial advantage in situational awareness. Blue needed to know the locations of Red forces in near-real time and deny such knowledge about its own forces.

What are the strengths and weaknesses of the operations executed in this campaign?

The aggressive Blue plans were designed to achieve strategic preclusion. In both cases, Blue initiated offensive operations very early in the campaign. Assessment judged these operations to be very successful. Red was defeated in engagement after engagement and by game’s end was almost entirely beaten.

The Blue concept of operations was to decisively engage Red forces before they could properly prepare to defend Azerbaijan and Georgia. This concept implied accepting risk in going on the offensive while Red had larger forces in the area of operations. When Blue initiated offensive operations (roughly D+6 in Case B and D+11 in Case A), Red still had larger forces available. By starting offensive operations so early, Blue had little time to inflict attrition on Red forces with joint fires before making contact on the ground. If Blue’s logistics effort had been disrupted during offensive operations, Blue and Green ground units in Azerbaijan and Georgia would have been in
precarious situations. Ground units in Azerbaijan were especially at risk because their sustainment depended entirely on an air bridge.

To what extent and in what ways will differences in speed and agility among future Army forces affect force cohesion and battlespace coherence?

We do not know the answer to this question.

From a mobility perspective, there were essentially two different types of forces: those which maneuvered by air (AABF, AMBF, LABF, 82nd Airborne Division, and Strike Forces) and those which maneuvered by land (MABF and LMBF, and most Army XXI units). Among the coalition forces, there was a similar distinction; some coalition units could move by air, while others could not. Forces which could maneuver by air proved the most versatile, but additional research is required to examine feasibility and affordability of the associated concepts.

On several occasions, air-maneuvering units penetrated deep into enemy-held territory (e.g., lodgment at Agnan in Azerbaijan in both Case A and Case B), far in advance of land-maneuvering units. Had Red disrupted the air bridges supplying these forces or delayed ground advance of Blue and Green heavy forces, the deep penetrating forces would have been endangered. Moreover, Blue needed closure of land-maneuvering units with air-maneuvering units to assure defeat of Red forces.

German operations in Russia during 1941 provide an analogy. The Germans repeatedly broke through Soviet defenses and advanced quickly in operational depth with armored formations (groups and armies). If the Red Army could counterattack, these armored formations were at risk until infantry divisions closed, usually at the speed of road-marching soldiers. Moreover, Soviet forces could break through an encirclement held only by armored formations. It took the greater staying power of German infantry divisions to hold an encirclement. Thus, common effort by armored formations and infantry divisions, the two main components of a hybrid force, was essential to the spectacular German victories during the summer and
It was the complementary employment of infantry and armor forces that led to the greatest successes of the Wehrmacht. Similarly, accurately assessing the strengths and weaknesses of Army XXI and AAN forces and developing complementary concepts of operations should result in an optimal balance of capabilities.

How will space-based operations contribute to the conduct of operations?

Army XXI forces, Strike Forces, and Battle Forces will all benefit from space-based operations that provide positional navigation, surveillance, reconnaissance, and communications. Space-based operations will be especially important to maintain connectivity across a hybrid force operating in a highly fluid and dispersed fashion. Therefore, protection of U.S. space-based assets will be critical to success of future Army forces. Recognizing the nation’s dependence on space assets, the Department of Defense recently announced that “Purposeful interference with U.S. space systems will be viewed as an infringement on our sovereign rights.”

37 Throughout World War II, the German army was a classic hybrid force. Germany never produced enough armored vehicles and motor transport to modernize its entire army. As a result, its infantry divisions relied on miscellaneous truck types, most designed for civilian use, and horse-drawn wagons for transportation beyond railheads. In Russia, horse-drawn wagons predominated, especially after severe climate and poor road conditions incapacitated many of the trucks. Maneuver in the field was limited by the speed and endurance of infantry on foot. Indeed, even the more modern armored divisions lacked sufficient numbers of satisfactory infantry carriers, with the result that infantry sometimes rode into combat clinging to tanks, as was also the practice in the Red Army. See Thomas E. Griess (ed.), The West Point Military History of the Second World War, Europe and the Mediterranean, New Jersey: Avery Publishing Group, Inc., 1989.


The U.S. may take all appropriate self-defense measures, including, if directed by the National Command Authorities, the use of force, to respond to such an infringement of our rights. . . U.S. space systems are national property afforded the right of passage through and operations in space. In this regard, space is much like the high seas and international airspace.