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STRENGTH and WISDOM

FUTURES SEMINAR
THE UNITED STATES ARMY IN 2025 AND BEYOND
A COMPENDIUM OF U.S. ARMY WAR COLLEGE STUDENT PAPERS

VOLUME ONE (2014)

Colonel Samuel R. White, Jr.

Editor

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U.S. ARMY WAR COLLEGE

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The United States Army in 2025 and Beyond

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FOREWORD

Academic Year 2014 (AY14) marks the inaugural year for the Futures Seminar – an elective course offered to resident students during the Term II elective period (Feb-Mar 2014) at the U.S. Army War College (USAWC). Created through a shared vision between the USAWC and the Army Capabilities Integration Center (ARCIC), the Futures Seminar is loosely modeled on the Army After Next Project (AANP), conducted at the USAWC in the late 1990s. Through the AANP, the USAWC hoped to leverage research and writing on strategic trends, the security environment, technology and other factors which would impact the Army in 10 to 25 years.

The first and only edition of the AANP Compendium, published in April 1998, featured seven strategy research papers (SPRs) written by USAWC students. The topics ranged from the future of infantry maneuver to data interoperability for a system of systems; from the intelligence information grid to strategic logistics; from unmanned aerial vehicles to revolutionary technologies. The AANP had hit the mark.

The Futures Seminar took a slightly different approach to student involvement in examining the Army of the future. Rather than publishing a collection of student SRPs (the capstone research paper which every Army War College student completes), the Futures Seminar was structured as a standard 10-class elective course. The seminar challenged students to examine a topic relevant to the development and implementation of Army initiatives in 2025 and beyond. Through lecture, speakers, discussion and research, students developed an understanding of challenges facing the Army in 2025+ and formulated recommendations and strategies to address one singular question:

"What kind of Army will we need in 2025 and beyond?"

At the end of the course students briefed their findings and recommendations, and prepared an 8-12 page paper which summarized their thoughts. This compendium contains those papers.

The Futures Seminar curriculum was organized to provide students a broad perspective of the challenges the Army will face through the next 10-25 years – both in the operational environment as well as the fiscal and political landscape – and provide texture to the Army's strategic planning guidance. The broad lesson topics were:

- Lesson 1: Course Introduction – Maintaining Strategic Hegemony

- Lesson 2:   Understanding Transition – Seeing Where We are Going by Knowing Where we Have Been

- Lesson 3: The Operational Environment over the Coming Decades

- Lesson 4: The Army Requirements in 2030 – Future Army Concepts, Policies and Strategies

- Lesson 5: Army Budget Outlook and Impacts over the next 10-15 years

- Lesson 6: Current and [Probable] Future War Plans

- Lesson 7: Strategic Transformation Choices: AC/RC Force Composition and Missions

- Lesson 8: Army Future Force Structure and Future Warfighting Capabilities

- Lesson 9: Unified Quest – A look at 2025 and Beyond

- Lesson 10: Student Recommendations

The 17 students who participated in the Futures Seminar were a true cross-section of the Army. Active duty, Army Reserve, Army National Guard and Department of the Army civilians – the class was well represented across all segments and greatly benefited from the diversity of ideas as well as experiences. But all the students did share one common belief – that as the Army once again stands at a transition point, now is the time for honest introspection and bold ideas.

These papers represent 17 different recommendations by 17 different Army War College students. In their words they look to add one small bit of perspective to one small piece of the very large question, *"What kind of Army will we need in 2025 and beyond?"* Are these recommendations

good ones? YES! They are as good as any other recommendation – and FAR BETTER than no recommendation at all. At the very least they have added to the professional discourse on serious Army matters.

Predicting the needs of the Army 10-25 years into the future is risky, tough business. As Colonel Richard H. Witherspoon wrote in his Foreword to the original *1997 Army After Next Project Compendium*, "This is a difficult task with no 'Right' or 'Wrong' markers." These students have hit the mark.

    Colonel Samuel R. White, Jr   Colonel Daniel A. Pinnell
    Deputy Director, CSLD   Director, PKSOI
            Faculty Team, The Futures Seminar

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Preserve the Regular Army and National Guard; Eliminate the Army Reserve

Lieutenant Colonel Edward W. Allen

The Army needs to reduce force size and structure to save money and resources. Over the next six years, the Army has to reduce force size due to budget cuts, and become smaller and leaner, yet still agile, flexible, ready, and technologically advanced. Conversely, the Army must be able to surge Active Component (AC) forces and capabilities into combat and generate the follow on forces and capabilities from the Reserve Component (RC) to the combatant commander in order to achieve strategic land power objectives and ensure success in joint missions.[1]

The Nation needs an Army in the year 2025 and beyond that is "a world-class Army capable of conducting the full range of operations on land, including prompt and sustained land combat as part of large, multi-phase joint and multinational operations by maintaining a force structure that we can man, train, arm, supply, and keep ready."[2] That is what the Quadrennial Defense Review (QDR) 2014 says, and we could all expect a similar message for several decades to come. To sustain this force, the Department of Defense should restructure and rebalance the Army, across the Active and National Guard components; and eliminate the U.S. Army Reserve (USAR).

Why eliminate the USAR? The Army needs one component for Soldiers to serve part-time, not two. The U.S. Army National Guard

1. Leon Panetta, *Sustaining U.S. Global Leadership: Priorities for the 21st Century Defense* (Washington, DC: The White House, January 5, 2012).
2. U.S. Department of Defense, *Quadrennial Defense Review 2014* (Washington DC: U.S. Department of Defense, March 4, 2014), IX.

Lieutenant Colonel Allen is a Regular Army Adjutant General Officer. His next assignment will be as the ACofS G1, USARCENT.

(ARNG) at 358,000 Soldiers strong is the better option versus the USAR at 205,000, because Soldiers can support both the Nation and State. The law restricts Soldiers in the USAR from serving in a military capacity for the State without Federal authority. Therefore, in times of State emergency, the USAR Soldier will have to sit on the sideline waiting for Federal activation while ARNG Soldiers respond. This restriction atrophies the USAR Soldier's experience and development, and squanders the Army's manning capacity and ability to provide defense support to civil authority.

The Army can become smaller and leaner by eliminating the USAR, and by doing so preserve its ability to remain agile, flexible, and ready. The ARNG if sustained as an operational reserve vice a strategic reserve gives the Army the ability to surge forces and capabilities. The Individual Ready Reserve (IRR) appropriately sized, managed, resourced, and maintained will give the Army the strategic reserve it needs to generate forces and capabilities. Arguable of course, but the USAR is a surplus capacity to the Army, and eliminating it can happen a little at a time and then all of sudden. This is not acceptable to do with the ARNG.

For the Nation's security and defense, the Army needs to preserve the Active and Guard force each at 450,000 Soldiers. The U.S. President, Congress, and citizens appreciate having a sizeable, lethal, and fully capable Army to deploy rapidly, support and protect the homeland, and win wars. Preserving this capability is the most important strategic challenge for the Army and it can do so by preserving its largest two components. By eliminating the 205,000 USAR Soldiers, the Army can preserve the 450,000 active duty Soldiers senior leaders say is critical to conducting the full range of operations on land, grow the ARNG's 92,000 Soldiers, and increase IRR size. The net difference is approximately 100,000 fewer Soldiers in the Army. The ARNG has the capacity to increase force size and the backing by State Governors across the United States to grow. This preserves the operational reserve force at an acceptable level for homeland defense and support while at the same time retaining the combat operational reserve capability the ARNG attained during the past decade of war in Iraq and Afghanistan.

What type of Army does the United States need in 2025 and beyond? By the year 2025, the Army should have an AC "Regular Army" force comprised predominately with combat units and the training institutions to educate, train, and generate Soldiers. The Division should be the Army's principal focus for the AC, each with three Brigade Combat Teams (BCT) that are distinct, independent, and self-contained. The Army should have a National Guard (NG) force comprised with both combat and combat support units. The Brigade should be the Army's principal focus for the NG, assorted with operational combat, support, and sustainment type battalions and companies capable of integrating with a Division or BCT as a force multiplier. Conversely, the Army should eliminate the RC force, absorbing most of it into to the ARNG and the IRR.

Assign, allocate, and apportion to the ARNG the preponderance of the Army's structure and mission for field artillery, light Infantry, and engineer. The ARNG should be the King and Queen of Battle for the Army. These are the least complicated of the combat capabilities and relatively easier to sustain than heavy armor or infantry. This would suit the ARNG better given the fewer training days ARNG Soldiers serve per year. In addition, the Army can anticipate a longer preparation time for the deployment of these capabilities in mass, after initiation of combat operations.

Assign, allocate, and apportion to the ARNG at least half of the Army structure and mission for military police, transportation, health, legal, and religious service and support. The ARNG will most likely use these types of capability for homeland support in time of emergency, such as disaster relief and civil disturbance. Military police in the ARNG for example also work in the law enforcement and corrections in the civilian capacity. Transportation Soldiers work in the ground fleet shipping industry as truck drivers and ground distributors. Doctors, lawyers, and chaplains in the ARNG also work as such in their civilian careers. This is beneficial to Army readiness because when Soldiers in the ARNG have civilian careers that correspond to their military career, the skills, knowledge, and abilities they need are more likely to remain sharp and proficient.

Assign, allocate, and apportion the preponderance of the Army's structure and mission for heavy infantry and armor, aviation, air defense artillery, and special operations forces to the Regular Army (RA). The RA should be the National response force, an offensive weapon that can deploy rapidly, project power globally, and stop any conflict before all-out war breaks loose. These are the most complicated of the combat capabilities and more difficult to sustain than field artillery or light infantry. This would suit the RA better given the full-time duty and training status for AC Soldiers. In addition, the Army can anticipate shorter preparation time for the deployment of these capabilities in mass, after initiation of combat operations.

Assign, allocate, and apportion to the RA at least half of the Army structure and mission for military intelligence, civil affairs, signal, and logistics. The RA will most likely use these types of capability for theater security cooperation ahead named operations and especially for shaping combat operations. This is beneficial not just Army Service Component Commanders, but especially to the Combatant Commanders of regionally aligned forces who integrate all the Joint functions in military operations, develop campaign plans, and set the theater.

By the year 2025, the Army should have just 450,000 RA, 450,000 ARNG, and at least 100,000 IRR Soldiers. An Army total force of one million Soldiers, reasonably balanced in operational AC and NG end-strength, complimented with a strategic reserve, and capable of rapid mobilization and deployment for homeland defense, security, and domestic support to civil authority. This type of Army also supports the U.S. President's authority to activate up to 200,000 members of the Selected Reserves (not more than 30,000 members may be of the IRR) to augment the active forces for any named operational mission or to provide support for responses to certain emergencies.[3] The role of the Army's IRR is to maintain a pool of military trained and ready Soldiers sufficient to provide 30,000 Soldiers consistent with Presidential

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3. U.S. Code, Title 10 – Armed Forces, sec 12304. *Selected Reserve and Certain Individual Ready Reserve Members; Order to Active Duty Other Than During War or National Emergency* (Washington DC: U.S. Government Printing Office, January 3, 2012) http://www.gpo.gov/fdsys/granule/USCODE-2011-title10/USCODE-2011-title10-subtitleE-partII-chap1209-sec12304/content-detail.html.

Reserve Call-up Authority (PRCA).[4] The President used this authority during the Persian Gulf War (1990-91), and since then for named operations in Haiti, Bosnia, Kosovo, Afghanistan, and Iraq.[5]

Between 2020 and 2025, the Army can eliminate accessions into the USAR, and transition into the ARNG or IRR the approximately 195,000 Soldiers expected to be in the USAR in 2017.[6] The IRR currently accounts for 32 percent of the Army's Ready Reserve population and will increase in the coming years due to the drawdown in end-strength.[7] Should the Army eliminate the USAR, the Army will need to build the IRR into an organization that has a dedicated command structure with a specific mission to manage the IRR and sustain maximum Soldier readiness. Doing this will strengthen the Army's ability to provide trained and ready personnel from the IRR to the force.

Starting immediately, the Army can initiate a new Total Army Analysis (TAA) process assuming only the RA, ARNG, and IRR components will make up the Army Total Force from 2025 and beyond. This TAA will produce the baseline for the Army to build its program objective memorandum (POM) for years 2020 through 2025 focused on shaping the Army, not on sizing it. From 2015 to 2020, the Army can use the Force Development Process, establishing the required capabilities across the DOTMLPF (doctrine, organizations, training, material, leadership and education, personnel, and facilities) in order to make the 2025 Army Structure recommendation to the Department of Defense for approval.

In conclusion, by eliminating the USAR, senior leaders can focus on a shaping the Army instead of sizing it for 2025 and beyond. The Nation needs the Army to be an offensive weapon, deploy rapidly, gain, sustain, and exploit control over land, resources, and people. The Nation also

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4. U.S. Department of Defense, *Accessing the Reserve Components*, Department of Defense Instructions 1235.12 (Washington DC: U.S. Department of Defense, February 4, 2010), 3.

5. Lawrence Kapp and Barbara Salazar Torreon, *Reserve Component Personnel Issues: Questions and Answers* (Washington DC: U.S. Library of Congress, Congressional Research Service, July 12, 2013), 18.

6. U.S. Department of Defense, *Quadrennial Defense Review 2014*, IX.

7. Kapp and Torreon, *Reserve Component Personnel Issues: Questions and Answers*, 5.

needs the Army to respond to crises in the homeland and generate forces that fight and win wars. The RA and ARNG can do that without the USAR.

Keep the Reserves Operational

Colonel Gregory W. Smith

Since their inception, the Reserve Components (RCs) of the U.S. Army have provided critical capabilities to the Army. Following the Vietnam War, the country transitioned from a draft Army to an all-volunteer force. By design, the only way the Army would have enough capability to meet all its missions was to include the Army National Guard (ARNG) and Army Reserve (USAR) capabilities into planning. This was the birth of the Total Force Policy – the plan to use the reserve components as a strategic reserve in the event of another big war. The operational tempo for the Army since 9/11 challenged this concept. The service relied on the reserve components to meet its operational requirements. In time, the Department of Defense developed the operational reserve concept that allowed the reserve components to mobilize on a recurring basis to meet the operational needs of the Army, while still providing strategic depth for the nation. This concept worked well and the ARNG and USAR supplied many units for operations in Iraq and Afghanistan.

Now that operations are winding down and the nation turns its attention domestically, there is growing political pressure to reduce defense expenditures. These reductions will result in the loss of end strength in all three components of the Army. Since an operational reserve is more expensive than a strategic one, resourcing the operational reserve may be at risk. That would be a mistake. Properly structured to take advantage of the unique strengths of the reserve components, an

Colonel Smith has served as the Force Integration Division Chief in the Office of the Chief of the Army Reserve. His next assignment will be the Director of the Joint Operations Center at U.S. Pacific Command. His Strategy Research Paper (SRP) examined the future of the Operational Reserve.

operational reserve force can provide critical capabilities to the Army of future.

The Department of Defense Directive 1200.17: *Managing the Reserve Components as an Operational Force* (October 2008) codified the informal policy that had been in-place since 2001. The directive instructed the services to integrate their active and reserve components into a total force.[1] The definitions section of the directive outlined, "The RCs provide operational capabilities and strategic depth to meet U.S. defense requirements across the full spectrum of conflict."[2] This short memo gave the services the ability to mobilize their RC units more than once, but it also levied the responsibility to resource the RCs to a level high enough to enable them to be successful when conducting operational missions.

Today the RCs have a great deal of capability. In 2013, the ARNG was authorized 355,000 Soldiers and the USAR was authorized 205,000 Soldiers. During the 1993 reserve component offsite, the Department of the Army decided that the ARNG would have all the RC ground combat forces and retain a balanced force of combat, combat support and sustainment units. USAR units would be primarily sustainment and combat support.[3] For some unit types, the RCs provide the bulk of the force. At the battalion level and below, 80% of the transportation units are in the RC. About 86% of the Echelons above Brigade (EAB) engineer units are in the RC. The ARNG accounts for a large share of the nation's ground combat power with 28 Brigade Combat Teams (BCTs), eight fires brigades, and eight division headquarters. Major USAR competencies include 10 medical brigade headquarters, 9 civil affairs brigades, and most of the theater level functional commands including theater engineer, aviation, and military police commands.[4] Soldiers in the RCs have more experience now than any time in the

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1. U.S. Secretary of Defense Robert Gates, "Managing the Reserve Components as an Operational Force" (Department of Defense Directive, Washington, D.C. October 29, 2008).

2. Ibid.

3. Michael D. Doubler, *I am the Guard: A History of the Army National Guard, 1636-2000* (Washington DC: Army National Guard, 2001), 346-7.

4. John Stoneburg, "The Modular Forces-FY 2020,"briefing slides version 31, (Washington DC: Army G 3/5/7 Force Management, November 21, 2013).

past. Since 9/11, the operational tempo for the RC has risen five-fold. By 2013, the ARNG had mobilized over 370,000 Soldiers and the AR over 200,000.[5] With unprecedented capability and experience in the Army's RCs, it is sound strategy to continue to resource them as an operational force – even in the face of reduced budgets.

The RCs are an excellent way to mitigate budget-induced risk by building and maintaining capabilities and capacity that are not affordable in the Active Component. The RCs have unique characteristics to consider when analyzing if transitioning capabilities into those components is appropriate. Many of these considerations are due to the part-time nature of the RCs. Since the bulk of a reserve unit only trains part-time, it takes longer for units to generate readiness. Under normal conditions, standing up a new unit or going through a major reorganization can take three to four years before the unit is deployable. To shorten this timeline requires an increase in training days and access to equipment and personnel. Time is also a factor in deployment. RC units require time between mobilization and deployment to complete administrative and medical requirements, receive theater specific training and final certification. The amount of time this takes is variable based on the type of unit and the amount of work done before mobilization. In general, smaller units can get through the mobilization station in 15-30 days. An ARNG brigade combat team count take up to 90 days to be certified.

Another unique characteristic of the RCs is that they are community based. This is very helpful for the ARNG when called to do state missions; they are already in the communities they support. The governors call on the Guard for many different Defense Support to Civil Authorities (DSCA) missions from hurricane response, to fighting forest fires, to augmenting security. Any change to the ARNG must take into account both their federal and state mission requirements. In addition, when activating or converting a unit, the RCs cannot require their Soldiers to change stations. They can either retrain soldiers in the new specialties or recruit new Soldiers in the local community. As community-based forces, most RC Soldiers have full time civilian jobs. This adds to the

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5. Bob Fiedler, "DoD Total Force Policy Matures," *The Officer* 89, no. 2 (March 2013): 40-1.

variety of skills resident in the RCs. These Soldiers bring both their military skills and civilian skills with them when they serve.

Many believe this is a good time to abandon the operational reserve policy. Operational tempo is slowing as major operations in Iraq and Afghanistan conclude. Budgets are tightening across the Department of Defense and the operational reserve may seem like a good target for reductions. Even with these pressures, it would be unwise for the Army to abandon the operational reserve. Predicting the future is difficult and eliminating forces potentially critical to meeting this uncertainly is a great risk. Retaining a variety of capabilities in the RCs is a hedge against this risk. Additionally, an operational reserve provides strategic depth to build capacity in the event that a robust response is needed in the future.

To mitigate risk of a capabilities miss-match, the service must consider the appropriate capabilities to place in the RC. Considering the unique characteristics of the RC covered earlier, several factors help measure the ability of the RC to produce successful units that can contribute as a standing operational force. These factors include the complexity of the unit, the anticipated missions, and employment of the unit, and speed of the need.

The complexity of a unit will affect the ability to train the unit before mobilization. A very complex unit will take longer to certify at the mobilization station. Complexity is characterized by the size of the unit (including number of sub-units) and the amount of synchronization required by for the unit to execute its missions. Units that require technical expertise such as engineer and military police units are appropriate for the RC since they are skills many unit members possess in their civilian occupations. Complex units also include BCTs and Combat Aviation Brigades. These large units require combined arms synchronization and are so large that they are split-stationed to ensure the recruiting pool is large enough to support them.

The anticipated employment of the unit refers to the types of missions the unit will conduct. In general, RC units are best suited for recurring and preplanned missions. This gives RC units with advance notice and the time to train and equip for a mission. This also frees the active

component to conduct the short or no-notice missions. Examples of appropriate RC missions are theater security cooperation and building partnership capacity. These types of missions give the RC unit time to build relationships in the multinational environment and enables a U.S. presence at a lower cost that an active component unit.

The speed of the need takes into account how much notice a unit will have before a deployment. It would not be appropriate to expect a RC unit to mobilize and deploy on a very short timeline. As a rule, the active component should have the capacity to supply units needed quickly and the RC programmed to provide the follow on forces. The RC can overcome exceptions to these considerations with more resources such as training time and adjustments to training strategy. However, given the costs of rapid deployment for RC units, this should remain the exception.

Maintaining the RC as an operational reserve provides strategic depth for the nation in the event unlikely but catastrophic events occur. The RC is a good place to keep capabilities and capacities that may not currently have a high demand, but may be required in the future should conditions change. Keeping units in the active component to address the probability of high-intensity conflict is cost prohibitive. The operational requirement for BCTs in the near future is declining as overseas operation slow. Placing these units in the RC keeps them on the shelf at a much lower cost and makes the expertise available when needed. The Army could consider some of the BCTs in the ARNG as strategic depth. In addition, ARNG BCTs are very well adapted to supporting the governors for their state missions. An infantry BCT provides a large number of trained Soldiers, communications equipment, and transportation capabilities to conduct a wide range of homeland missions. Other capabilities in the RC also provide strategic depth, including sustainment and support units whose missions have been largely contracted out over the past decade. If the Army has to operate in an austere and non-permissive environment, these units will become very important.

There are many challenges in the future that are difficult to predict. Budget challenges and a reduction of deployments make reductions in the Army inevitable. It is critical that the Army continues follow the operational reserves construct. Even though the operational reserve

is more expensive than a strategic reserve, it is worth the investment. The operational reserve provides a less costly way to mitigate the risk of the reduction of active component capabilities and capacity. It also provides strategic depth for units that are not fully employed now but could be needed should an unpredicted event occur. By carefully considering the units put into the reserve components and weighing them against the unique characteristics and challenges of the RC, the benefits of an operational reserve will far exceed the costs.

Options for Tomorrow's Army

Colonel Michael J. Lawrence

After more than twelve years of conflict and amid ongoing budget reductions, the Joint Force is currently out of balance…Although our forces will no longer be sized to conduct large-scale prolonged stability operations, we will preserve the expertise gained during [OIF and OEF]. We will also protect the ability to regenerate capabilities that might be needed to meet future demands.[1]

—2014 Quadrennial Defense Review (QDR)

A core theme of the FY 2014 QDR is one of "rebalance." The Chairman of the Joint Chiefs of Staff, General Martin Dempsey, states that, "the Joint Force has been focused on a single type of conflict" for so long that it is no longer ready for the full spectrum of potential conflict, so a rebalance of capability to other types of conflict must occur.[2] Unfortunately, the likely outcome is a rebalance based

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1. Charles T. Hagel, *Quadrennial Defense Review* (Washington DC: U.S. Department of Defense, March 2014), 29.

2. General Martin Dempsey, "Chairman's Assessment of the Quadrennial Defense Review," in *Quadrennial Defense Review* (Washington, D.C.: U.S. Department of Defense, March 2014), 59.

Colonel Lawrence is an infantry officer who last commanded 2nd Battalion 23rd Infantry (SBCT) at Joint Base Lewis McChord, and will next serve as the Chief of Future Operations, U.S. Army Pacific. His paper advocates for a revised definition of the Range of Military Operations in order to address security gaps as the U.S. Army determines where and how to manage a downsize during a period of austerity.

primarily on cost and benefit analysis, leaving the services to argue which is the more affordable option.

Unless an adequate analysis or framework for balancing capability across the spectrum of conflict is developed, capability gaps will inevitably occur and the Department of Defense (DoD) will fail to address key threats before they form. This paper advocates a revised definition for "spectrum of conflict," or range of military operations, to include scale and sophistication of adversary capabilities as a way of clarifying where the force must rebalance. With a revised definition, this paper proposes the Joint Force mitigate any security gaps with Stryker Brigade Combat Teams (SBCTs) as well as align organizational capability by mission.

Current framework for spectrum of conflict is defined as a "range of military operations" (ROMO). Joint Publications (JP) 3-0, *Joint Operations*, describes military operations as varied in scope, purpose, and conflict intensity across a range that extends from military engagement, security cooperation, and deterrence activities to crisis response and limited contingency operations and, if necessary, to major operations and campaigns.[3]

Because the range of operations described in JP 3-0 only delineates military operations by scope, purpose, and conflict intensity, it fails to capture critical qualitative differences among counterinsurgency (COIN), hybrid threats, conventional military operations, and now operations against anti-access/area denial (A2/AD) threats.[4] All of these operations require different capabilities, methods, and concepts of operations.

A spectrum that varies in scale and sophistication of adversary capabilities better describes how various kinds of conflict affect U.S. forces.

3. Chairman of the Joint Chiefs of Staff, *Joint Operations*, Joint Publication 3-0, (Washington, DC: U.S. Joint Chiefs of Staff, August 11, 2011), V-1.

4. Paul Scharre, "Spectrum of What?" *Military Review* (November-December 2012), 74, http://usacac.army.mil/CAC2/MilitaryReview/Archives/English/MilitaryReview_20121231_art012.pdf (accessed March 15, 2014).

Scharre's Military Operations Spectrum[5]

For example, at the low end conflict are irregular operations like COIN, counterterrorism (CT), and stability/support operations (SASO); major combat operations (MCO), A2/AD, and nuclear war on the high end. As the scale moves from the low toward the high end of the spectrum, the adversary's capabilities increase in technological sophistication, training, and their ability to scale up operations executed by larger organized coherent fighting formations.

Traditional maneuver warfare against conventional militaries is no longer the most sophisticated challenge the Joint Force might face.[6] Sophisticated challenges are now threats from adversaries that possess A2/AD capabilities, intercontinental ballistic missiles, cyber warfare expertise, and the ability to weaponize chemical, biological, radioactive, and nuclear devices. Most U.S. Army capabilities occupy the middle part of the spectrum where traditional maneuver warfare has been historically strong. Those Army capabilities aligned in the middle of the spectrum are principally composed of Armored Brigade Combat Teams (ABCTs). SBCTs are also considered maneuver formations, but lack the heavy armor to fight traditional maneuver warfare. Therefore, SBCTs primarily operate with Infantry Brigade Combat Teams (IBCTs) and Special Forces Groups in the middle to low end of the spectrum. Unfortunately, ABCT capabilities do not translate well across the low end of the spectrum without suffering a significant loss of readiness in their primary mission (maneuver warfare) capabilities.

The challenge for the Army's armored brigades in the contemporary operating environment is that traditional maneuver warfare is only a

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5. Ibid., 75. The graphic used here is a modification of the Scharre original.
6. Ibid.

relatively small slice on the spectrum of conflict.[7] The threat environment favors hybrid threats in the middle to the left end or the high end of the spectrum – where U.S. historical strengths are either neutralized or irrelevant. The dilemma for the Army is whether it should re-invest on the low end, both ends, or right-middle. Preserving "at-risk" maneuver capabilities in the current fiscal environment demands that the Army restructure these capabilities against a different future.

Options in a Period of Austerity

The Army has a total of sixteen ABCTs – eight in the active component and another eight in the Army National Guard. In order to facilitate DoD investment at the ends of the spectrum, the Army can choose from three different courses of action (COA):

- COA 1: Deactivate Active Component ABCTs and mothball the capability with all its equipment. Retain National Guard ABCTs.

- COA 2: Deactivate at least half of all maneuver (i.e., armored) warfighting capabilities in both the active component and National Guard component.

- COA 3 (Preferred): Reorganize 8x Active Component Army ABCTs into 2x Joint Combat Groups composed of both Marines and Soldiers organized around the "MacGregor Transformation Model." Convert half of National Guard ABCTs into IBCTs.

Of the three courses of action, COA 1 provides the greatest savings which DoD could quickly reinvest on the high end of the spectrum in the form of readiness or research and development of innovative technologies. A drawback to COA 1 is the consequence of a misread of the security environment, particularly when the ABCT warfighting capability provides a deterrent to would-be adversaries. COA 2 provides some savings, but not really enough to pay back dividends in research and development over the long-term. Deactivation of National Guard units is also politically difficult, so the only possible option is a conversion to IBCTs which equates to marginal savings since the largest overhead cost is in personnel. COA 3 provides the greatest change opportunity which could serve as a catalyst to force

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7. Ibid, 73.

transformation of U.S. landpower. Additionally, the Marine Corps would reciprocate with an equal commitment to Joint Combat Groups, resulting in the elimination of armored formations above company level in both services. Hence, the only heavy armored formations in the U.S. inventory would exist in these 4x Joint Combat Groups. Joint commitment in manpower and material would create a net savings greater than if the U.S. Army eliminated its entire active and reserve component ABCTs.

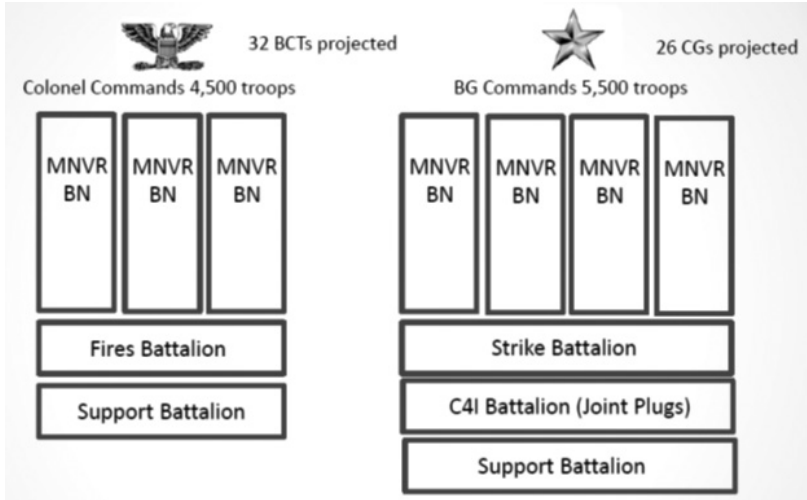## Joint Combat Groups – MacGregor Transformation Model

> *Today's international security order is an order with the United States at its center, but an order built without ground forces is an order whose foundation rests on sand. American strategic dominance will erode quickly without an Army organized, trained, and ready to operate in a new strategic environment where traditional service distinctions are increasingly meaningless.*[8]

> —Colonel (Ret.) Douglas A, Macgregor, *Breaking the Phalanx*

Colonel (Ret.) Douglas MacGregor first published *Breaking the Phalanx: a New Design for Landpower in the 21st Century* in 1997. MacGregor described a military transformation to a smaller, less expensive force which could produce greater combat capability than the larger formations that exist today. Those recommendations were rejected then as far too radical and the Army opted instead for incremental changes that have left it little changed from the version that won Desert Storm. He then updated his "MacGregor Transformation Model" (MTM) to incorporate the lessons of both Iraq and Afghanistan in *Transformation under Fire*. His recommendations are straightforward, simple to understand, but address all the intangibles like culture, training and leadership. More importantly, his solutions utilize existing structure, equipment, and strategic conditions to affect reform. The core of MTM is a reorganization of Army and Marine forces into "Combat Groups" that would replace the current brigade-centric system for organizing forces. These Combat Groups include the major elements of fighting forces such as maneuver, strike, intelligence, surveillance,

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8. Colonel (Ret.) Douglas A. Macgregor, *Breaking the Phalanx: A New Design for Landpower in the 21st Century* (Westport, Connecticut: Praeger Publishers, 1997), 25.

reconnaissance, and sustainment units that are self-sustaining, but can "punch above their weight."[9] The differences between a BCT and the Combat Groups are obvious – more capability, more capacity, and commanded by more senior war fighters.

32 BCTs projected			26 CGs projected			
Colonel Commands 4,500 troops			BG Commands 5,500 troops			
MNVR BN	MNVR BN	MNVR BN	MNVR BN	MNVR BN	MNVR BN	MNVR BN
Fires Battalion			Strike Battalion			
Support Battalion			C4I Battalion (Joint Plugs)			
			Support Battalion			

Command and Structural Comparisons of BCTs and Command Groups[10]

Rather than proposing all BCTs be transformed into Combat Groups, this paper advocates that initially all heavy armor formations above company in both the Marine Corps and the U.S. Army are consolidated into the four Joint Combat Groups. The Marine Corps would serve as the base element for two of the Combat Groups and the Army the base for the other two. The formations would be a mix of both Marines and Army Soldiers specially selected from performance records, a joint board process, and validated during exhaustive physical tryouts and mental exams. These four Joint Combat Groups would then become an elite 20,000 man armored fighting corps that would serve to effectively deter conventional war during this interwar period, but would also posture a smaller U.S. military for competitive advantage when the next war of decision begins.

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9. Ibid, 87.

10. Colonel (Ret.) Douglas A. Macgregor, "Shaping the Army for Joint Warfighting," briefing slides with scripted commentary (Washington, DC: Capitol Hill Club, November 19, 2013).

In sum, implementing the MTM will cut approximately 25,000 soldiers from the Army inventory and roughly 10,000 Marines from the Corps. Based on the MTM success, it could then be applied against the remainder of the Army and Marine Corps, restructuring both services for more effective application of military power while increasing savings that could be reinvested towards innovation. Joint operating concepts and transformation would also be revised to eliminate redundant missions and capability. More importantly, the U.S. military would retain landpower capability needed to ensure readiness for the unexpected and deterrence against an emboldened adversary.

Conclusion: Emerging Army of the 2020's

The Army at the end of this interwar period will look a whole lot like a smaller version of itself today, using essentially the same equipment, projecting national influence from the same bases, and deploying to places where the United States expects partner cooperation in pursuit of shared interests. It will primarily be a light infantry-centric formation with a Special Forces mission and elite-joint armored maneuver Combat Groups at its core. The difference between now and 2025 lies primarily in how both the Army and Marine Corps are organized as a joint landpower force ready to fight and win a war of decision in 10, 15, or 20 years.

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STRENGTH *and* WISDOM

Restructuring the United States Army Force Structure

Colonel Christopher S. Moretti Sr.

We should be careful to get out of an experience only the wisdom that is in it – and stop there; lest we be like the cat that sits down on a hot stove lid. She will never sit down on a hot stove lid again – and that is well; but also she will never sit down on a cold one.[1]

—Mark Twain

United States military leaders are and must be effective futurists. When leaders fail to embrace this critical portion of their professional identity, they tend to fail to identify emerging and future threats or to structure the military forces to defend the nation's interests against them. Today, our nation's military leaders face significant national security and environmental challenges. The nature of the security environment, and the specific ways in which our threats have chosen to challenge the United States and its interests have changed

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1. Mark Twain (Samuel L. Clemens), *Following the Equator: A Journey Around the World* (Harper and Brothers, New York, 1989), 125.

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dramatically over the last 14 years, and will likely remain in this form and grow more severe until we (the United States) demonstrate that we can operate effectively in this environment. We need to rethink our strategic approach to this environment, and restructure the Army to successfully execute a new, more effective approach. A key component in the Army's narrative to retain force structure involves a significant involvement in South Korea. For the last 61 years, the United States kept the Korean peninsula stable, but at significant financial cost. It is not the intent of this paper to argue those costs involving Korea, but to examine Army force structure based on a viable threat and viable national interests.

Our current strategic approach through 2030 – leveraging a CONUS based, modular structured, and leaner force reliant on projecting power globally with scalable capabilities to provide mission tailored forces to combatant commanders[2] – is flawed. A more effective and efficient approach would promote deterrence, prevention, and preparedness through forward deployed and engaged forces that are rapidly reinforced from CONUS. These engaged forces tightly partnered in well-resourced security force assistance and combined exercise programs with allies, would strengthen the allies' capacity and capability to bear an increased portion of the global security burden.

The correct Army to face this environment and execute this new strategic approach is a forward deployed force leveraging the total Army through rotation, sea-basing or permanent forward basing. It must be regionally competent and experienced, rapidly reinforced using reformed equipment and formations in the active and reserve components 2nd tier units, and moved quickly by a next generation sea/airlift force. The next generation sea/airlift concepts and capabilities require further technological development and advancement, but are not far from realization.[3] Once developed, the nation's demonstrated ability to more rapidly move and establish its Army in contested areas will have tremendous positive effects on the future environment.

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2. General Raymond T. Odierno and John M. McHugh, *Army Strategic Planning Guidance* (Washington DC, 2013), 4.

3. General Robert W. Cone, *Unified Quest 2013: Deep Future Wargame 2030-2040 Executive Report* (Department of the Army, Washington DC, November 2013), 10.

Admiral Gary Roughead and Kori Schake proposed cutting the active Army component from 490,000 to 290,000.[4] Considering the budget constraints the Department of Defense (DoD) is experiencing, the reduction may be appropriate in this environment. However, the vision outlined in the current Defense Strategy points to a larger force. This larger force structure requires sizing for the near-term threats of al Qaeda and the potential future adversaries and regional powers Russia and China. Some analysts also view the size of the Army as secondary to the question of whether the nation needs an Army at all. Other critics argue for limited interventions or ideal conditions before the nation commits its land forces in the future. However, the future does not bend to the desires of leaders. Rather the enemy, the environment, and core national interests will have the greatest impact of where and when the nation will commit its land forces in the future.[5]

There is no conventional existential threat to the United States through 2030. Hybrid threats will be the constant variable upon the future battlefield seeking to engage U.S. forces asymmetrically, while employing hybrid doctrine and capabilities in and throughout all domains. The lack of a conventional threat provides our nation the time and space needed to change our force structure and global posture. A long-term threat strategy focusing on attacking the U.S. economy indirectly necessitates an economically viable force structure to combat the threat with a sustainable strategic approach for the next 15-20 years, to mitigate the nation's risk associated with its national security interests and fiscal challenges.

Force Structure Costs

Manning the Force (Personnel)

Personnel costs dominate the Army's fiscal year 2015 budget of $117.35 billion. It dominates the budget with 50% of costs ($59.22 billion) compared to 26% ($30.79 billion) for readiness, and 21% ($24.31

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4. Admiral Gary Roughead and Kori Schake, *National Defense in a Time of Change* (The Hamilton Project, Washington DC, 2013), 2.

5. Francis G. Hoffman, *What the QDR Ought to Say about Landpower* (Institute for National Strategic Studies, Parameters 43(4), Winter 2013-14), 8.

billion) for modernization.[6] Soldiers are the Army's basic weapons systems, and personnel costs are thus its largest expense. However, if not kept in proper balance with infrastructure, material, operations and maintenance costs however, personnel costs can have a dramatic negative impact on force size, force readiness, and Army modernization efforts. Most observers believe we are badly out of balance, and the imbalance is growing exponentially.

Of the three types of expenditures, disagreement and debate about personnel costs and their impact to force structure is the real issue. The Military Officers Association of America (MOAA) violently disagrees with the DoD's assertion that spiraling personnel costs are consuming larger portions of the Army budget. MOAA argues that personnel costs remained constant at 33% of budget for the past 30 years.[7] The Department of the Army G8 personnel cost analysis also supported the argument that personnel costs historically remained semi-constant from 1948-2014 at approximately 35-45% of budget. However, where they differ with MOAA is recognizing that while the costs remained constant over time, the force structure itself significantly reduced in size.[8]

Therefore, when comparing the costs to the amount of Soldiers in the force over time, the ratio of cost to individual Soldier increased dramatically. For example, today's compensation cost per individual active Soldier of $92,000 is more than double the compensation costs of a reserve component Soldier at $38,000. This single cost ratio can't be ignored when examining future force structure changes and its impact to the Army's yearly budget.[9] This disparity in personnel costs factors heavily upon force structure with expected reduced budgets and increasing costs in readiness levels and modernization efforts.

These projected costs and related impacts to readiness led to the Army's revised approach to progressive unit readiness and increased its operational and strategic risks. In order to prevent a dramatic reduction in unit training and equipment readiness by maintaining

6. Brian Stokes, "Army Budget Outlook and Impacts to 2030," lecture (U.S. Army War College, Carlisle Barracks, PA, March 6, 2014), cited by permission.
7. Vice Admiral Norb Ryan, USN (Ret), *The Truth About Military Personnel Costs Video* (Military Officers Association of America, Washington DC, 16 August 2013).
8. Stokes, "Army Budget Outlook and Impacts to 2030"
9. Ibid.

more force structure than it could afford, the Army chose to reduce its force structure by the end of FY2014 from 530,000 to 508,000 Soldiers. By the end of FY2015, the force will be further reduced to what most senior leaders in the Army refer to as the optimum size of 490,000 Soldiers to achieve the revised national military strategy.[10]

The Army G8 uses an estimate of $1.5 billion annual support cost per 10,000 Soldiers. Therefore drawing down from 570,000 to 490,000 personnel results in $12 billion reduced costs. Further programmed reductions in personnel levels by the end of FY2017 will result in a force of 440,000-450,000 active component Soldiers (minimum accepted risk), and that could potentially go as low as 420,000 active component personnel; 315,000 in the National Guard, and 185,000 in the Army Reserve.[11] Drawing down from 490,000 to 420,000 personnel results in another $10.5 billion reduced costs. These personnel reductions beyond the 420,000 active component, 315,000 National Guard, and 185,000 in the Army Reserve with expected future FY17 and beyond funding levels, will not allow the Army to execute the Defense Strategic Guidance.[12] From FY2014 to FY2017, the Army will continue to have degraded readiness and extensive modernization program reductions; however reprogramming the achieved savings of $22.5 billion reduced costs in personnel will be vital to regaining its balance between end-strength, modernization, and readiness.[13]

Readiness

The real crisis for defense spending is not the downward pressure on the defense budget, but rather issues from within the Army budget.[14] A main spending concern is the Army's requirement for 50 or more brigade combat teams (BCTs) to meet its missions based on the National Military Strategy. Maintaining readiness to the sized forces against current

10. Lieutenant General Howard B. Bromberg, "Strategic Landpower and the U.S. Army," lecture (U.S. Army War College, Carlisle Barracks, PA, March 4, 2014), cited by permission.

11. McHugh and Odierno, *Statements on The Posture of United States Army Before The Committee on Armed Services United States House of Representatives*, 5.

12. Ibid.

13. Remarks by General Raymond T. Odierno, *Future of the Army* (National Press Club, Washington DC, 2014).

14. Roughead and Schake, *National Defense in a Time of Change*, 5.

planned full major combat operations plans is not sustainable nor feasible when allocating only 26% of projected Army budget levels to readiness. Maintaining readiness for regionally aligned forces tailored formations presents different challenges to allocated readiness dollars budget given the higher operational tempo required for its engagements. Readiness for the tailored portion of the Regionally Alligned Forces (RAF) formations is sustainable during its train-up period and deployment at the expense of the remainder of the formation that is not employed as part of the RAF.

Under the current policy, studies reflect it takes two or more reserve component units to provide the same output as one active component unit.[15] Analysis of the cost data from the Army FORCES Cost Model depicts two smaller reserve component units if not mobilized, costs only 63% of one active component unit. However, when mobilized the costs increases to 92% of one active component unit. Using the same model, it depicts two larger reserve components (BCTs and attack aviation units) when not mobilized, costs 107% of one similar active component unit. However, when mobilized, the costs increase to 126% of one similar active component unit.[16] Clearly, mobilization of reserve component units is a steep expense, but only when the units are mobilized for active duty. Readiness costs are further compounded by the additional reserve component units required to be created in lieu of active component counterparts.

According to Headquarters Department of the Army G-8 (PA&E) figures, the yearly cost for an active component SBCT is approximately $1,061,621,499. Its personnel costs equals 86% of the cost while its operating and maintenance cost equal 14% of the cost. Active component IBCT and ABCT yearly costs are similar to the SBCT's. In both the IBCT and ABCT formations, personnel costs equal 87% and 84% respectively, while operating and maintenance cost are also close to an SBCT's at 13% and 16% respectively. So when comparing the readiness costs to most reserve component units, the cost difference between AC and the RC is fairly small. However, some RC units such as attack aviation battalions and armored and Stryker brigade combat teams are far more expensive in the RC than in the AC if required to

15. Joshua Klimas and Richard E. Darilek, *Assessing the Army's Active-Reserve Component Force Mix* (Rand Corporation, Washington DC, 2013), 7.

16. Ibid., 9.

mobilize and deploy.[17] For example in order for an RC attack aviation battalion to deploy and replace an AC aviation battalion, it will require two RC battalions; one battalion deployed and the other battalion mobilized and training simultaneously. The costs of two simultaneously mobilized RC battalions are equivalent to 126% cost of one AC unit.[18] Conversely, the longer RC units go between mobilizations, the more dramatic the cost savings to the Army with regard to RC over AC units.

Because of the decision to reduce the active component force, greater reliance has been placed on the National Guard and Reserves, requiring the Army to keep its reserve forces at greater levels of readiness than prior FY2001 levels.[19] The Chief of Staff of the Army recently suggested:

> *If the Army had to fight two large, simultaneous, long-term wars; the United States would rely more heavily on allies and request a large-scale mobilization of the reserves. The reserves would also be used to "buy time to increase the size of the active component, and because of the requirement for higher readiness, a new readiness model would need to be developed to keep the National Guard and Reserves at a higher state of readiness.[20]*

This increased reliance on the reserve component force through 2030 also involves shifting more assets from the AC to the RC. The AC-RC force mix decisions consider both capability and cost. Since U.S. forces will no longer be sized to conduct large-scale prolonged operations, roughly an additional 15-20% of the active component BCTs can be shifted to the RC. The RC forces will then provide the bulk of the Army's MCO forces, while the AC primarily focuses on the remaining priority missions emphasizing regionally aligned forces, counterterrorism, counterinsurgency, and humanitarian assistance operations. RC forces, as part of a total Army rotational effort in the future strategic approach, can further tailor unit composition based on the threats in the region which they would rotate in to. Many smaller RC units can get ready to deploy relatively quickly after mobilization,

17. Ibid., 10.

18. Ibid., 9.

19. Andrew Feickert, *Army Drawdown and Restructuring: Background and Issues for Congress* (Congressional Research Service, Washington DC, 2013), 7.

20. Transcripts of Army Chief of Staff, General Raymond T. Odierno, *Army Briefing on the FY13 Budget Request* (Washington DC, 2012).

and they are more advantageous in cost-per-output within the total Army rotational effort.[21]

Modernization

High personnel and readiness costs impact resources earmarked for research and development, science and technology, and force modernization. In the Army's FY2015 budget, $24.31 billion – roughly 21% of its annual budget is allocated to its modernization program that includes installation and infrastructures, and equipment acquisition and disposal.[22] As many of the existing "Big-5" platforms are aging, they require replacement or continued modernization efforts. These replacement systems or modernization efforts are more expensive today and will continue to grow in costs through 2030. Modernization efforts moving forward to 2030 and beyond will require smart and judicious choices based on the nation's strategy, the environment, and the threats. The popular military analyst, Ralph argued that:

> *The systems on which American taxpayers will spend nearly a trillion dollars over the next few decades will have only limited utility against unconventional threats armed with conviction and rage. Worse, we are, and will continue to be, unwilling to use most of those systems in any crisis short of conventional war. We continue to build a military to fight any enemy that no longer exists, while ignoring the enemies at our door.[23]*

If the consensus proves true and weapons of mass destruction, irregular and hybrid warfare, and complex anti-access systems become fixtures of the future environment, changes in the character of warfare will make it more challenging in identifying and optimizing an effective modernized force structure.[24] This future force structure must be affordable and capable, emphasizing capability over capacity.

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21. Klimas and Darilek, Assessing the Army's Active-Reserve Component Force Mix, 2.

22. Stokes, "Army Budget Outlook and Impacts to 2030"

23. Ralph Peters, "We Don't Have the Stomach for This Kind of Fight," *The Washington Post* (Washington DC, 1988), sec. C, 1.

24. Colin Gray, *Another Bloody Century: Future Warfare* (Orion Publishing, 2012), 174-175.

Conclusion

In the next 15-20 years our nation will experience a complex array of geopolitical, economic, and technological challenges that will transform the world. These global challenges necessitate a strategic approach and force structure through 2030 to mitigate the nation's risk associated with its national security interests and fiscal challenges. The risks our nation accepts on the future force structure of the Army and its strategic approach must be balanced against the nation's constrained resources and existing complex environmental conditions. Measuring these risks is prudent and require careful balancing against potentially hollowing out the Army's capabilities through buying and sustaining a force incommensurate with the National Security Strategy and National Military Strategy.[25]

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25. Roughead and Schake, *National Defense in a Time of Change*, 19.

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STRENGTH *and* WISDOM

What Type of Army Does the Nation Need in 2025 and beyond?
"Army CBRN Forces"

Colonel Antonio V. Munera

The gravest danger to the American people and global security continues to come from Weapons of Mass Destruction.

—President Barack Obama[1]

Our Defense Strategic Guidance, *Sustaining U.S. Global Leadership for the 21st Century Defense,* identifies ten primary missions for the U.S. Armed Forces. Of the ten, Countering-Weapons of Mass Destruction (CWMD) is specifically highlighted as a primary mission and plays significantly in two other missions: Maintain a safe and effective nuclear deterrent; and defend the homeland and provide support to civil authorities.[2] Additionally, the National Defense Strategy for CWMD states that potential adversaries of the United States will continue to pursue WMD to enhance their

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1. Barak H. Obama, *The National Security Strategy* (Washington, DC: The White House, May 2010), 4, 24.

2. Leon Panetta, *Sustaining US Global Leadership: Priorities for the 21st Century Defense* (Washington, DC: U.S. Department of Defense, January 2012), 5.

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ability to exert global and regional influence against our perceived conventional advantage.[3] Heightening the risk is the ability of a wider range of actors to gain access to WMD due to the increased availability of dual-use technologies, increased flow of expertise and declining security apparatuses around the globe. Adding to the complexity is the growing list of emerging threats that could produce a chemical or biological agent which the United States and its partners and allies are unprepared to defend against. Emerging agents that do not violate the Chemical Warfare Convention moratoriums on possession are very difficult to detect and can potentially circumvent current protective gear and countermeasures. Agents, made possible by breakthroughs in technology, are capable of serving as anti-access and area denial measures to prevent the United States from projecting power while threatening the security of our global partners.

Use of chemical weapons in Syria, the discovery of undeclared stockpiles in Libya, the use of incapacitating agents in the Dubrovka Theater in Moscow, the continued pursuit of nuclear weapons in Iran and Korea, the release of radiation from the nuclear disaster in Fukushima, Japan, and the anthrax attacks against members of the U.S. Senate and news media are all recent events that highlight the growing threat from state and non-state actors that cause U.S. and international concern. Given the remnants of traditional WMD programs across the globe and the potential for the use and proliferation of emerging threats the Department of Defense (DoD) is undergoing a paradigm shift in its approach to CWMD. A shift in which the existence of WMD is no longer accepted as a condition of the environment and, in many cases, CWMD has the primary mission objective. As a result, the DoD must shift its traditional focus from simply responding to the consequences of a WMD attack to an active prevention role to ensure no new actors obtain WMD; those possessing WMD do not use them; and – if WMD are used – their effects are minimized.[4]

Among the services, the Army is preeminent in providing expeditionary capabilities to respond to large scale CWMD requirements. The Army's

3. U.S. Department of Defense, *Draft National Defense Strategy for Countering Weapons of Mass Destruction* (Washington, DC: U.S. Department of Defense, May 2013), iii.

4. Ibid., 1.

is well-postured to provide maneuver, intelligence surveillance and reconnaissance (ISR), sustainment, an organized "all hazards" chemical, biological, radiological, nuclear and explosive (CBRNE) technical response force and the only corps of CBRNE/CWMD professionals in the DoD.[5] The Army has the ability to deploy conventional and specialized assets to: locate, identify, characterize, assess, isolate, secure, seize, exploit, neutralize, destroy, reduce, dismantle, dispose, monitor and redirect WMD – while safeguarding the force and providing critical capabilities to assist foreign and domestic partners in recovering from a WMD attack.[6]

Despite the clear importance of the CWMD mission and the significant capability it could provide the Joint force and the nation, the Army continues to place the mission below other warfighting requirements in terms of resourcing. An understandable lack of focus in CWMD occurred over the past decade during stability operations in Iraq and Afghanistan, but this is not an acceptable risk in the future as the nation moves to a more proactive approach to preventing WMD proliferation and use. The lack of emphasis is best captured in the recently released Chief of Staff of the Army study, *Testing Assumptions about the Role of Land Power in 2030*. According to the study, "…within the Army, the capacity and capability (for CWMD) are fractured and not wholly integrated as part of the conventional force."[7] Due to the fractured approach and the failure to prioritize the CWMD mission among other requirements, critical shortfalls exist in the Army's ability to meet current and future CWMD requirements. The CBRN force structure is out of balance.

The current Army force structure is overly weighted to response to the consequences of a WMD attack from Cold War era threats versus the operational and strategic requirement to take active measures to prevent

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5. Brigadier General Peggy Combs, "Synchronizing the Countering Weapons of Mass Destruction (CWMD) Mission," Information Paper, Fort Leonard Wood, MO, May 31, 2013.

6. U.S. Department of Defense, *Draft National Defense Strategy for Countering Weapons of Mass Destruction*, 11.

7. Chief of Staff of the Army's Strategic Study Group, *Testing Assumptions about the Role of Land Power in 2030 – Final Report* (Arlington, VA, July 2013), 17-20.

the proliferation or use of WMD. CBRN assets within the Army's force structure are not rapidly deployable, require heavy strategic lift support and remain focused on responding to large scale maneuver equipment decontamination and on mounted reconnaissance to mitigate the effects of the employment of chemical weapons. With the exception of North Korea, most experts agree that large scale conventional use of chemical weapons against tactical maneuver forces is not a likely enemy course of action. Future WMD attacks against critical points of debarkation or embarkation as an anti-access/area denial measure or an act of terrorism against civilian populations and infrastructure (at home and abroad) is more likely. Given the future threat, the Army has:

- Excess capability to conduct heavy decontamination of tactical vehicles and equipment. Two hundred and ten decontamination platoons exist across all components.

- Ad-hoc capabilities to conduct mass casualty decontamination in support of domestic or foreign consequence management. Most equipment is commercial off the shelf items and is not integrated into a program of record.

- Limited capability to conduct fixed site and area decontamination to counter an adversary's use of WMD as an anti-access/area denial measure.

- Limited dismounted CBRN reconnaissance capabilities and force structure to rapidly identify, control, and exploit WMD sites.

- Limited field analytic capability to conduct confirmatory analysis to protect the force and rapidly respond to emerging CBRN threats.

- Limited expeditionary capability to disrupt, destroy, dismantle, and neutralize WMD sites and material.

- Limited flexible and scalable force packages to rapidly respond to emerging WMD crises. Due to size and weight, current CBRN forces require extensive strategic air support.

- Lack of integration of General Purpose Forces (GPF) to support CWMD missions. Specifically, locating and securing WMD sites and material.

CWMD Capabilities and Regional Alignment

The global nature of the WMD threat requires a regional response capability with the appropriate mix of conventional, special operations forces (SOF) and CWMD technical forces. To date, there are no force management models (supported by requisite concepts of operation and DOTMLPF analysis), to support alignment of technical CWMD assets with regionally postured Army counterparts.[8] Current initiatives to regionally align CWMD assets undertaken by organizations like the 20th CBRNE Command are certainly a very valuable starting point; however, this issue requires a whole of government approach to ensure proper aligning of national capabilities. Regionally aligning CWMD capabilities is a strategic issue that requires an overarching senior-level synchronizer to ensure the Army is postured across DOTMLPF and subordinate commands to meet the needs of the combatant command and the nation.

CWMD Efforts Require Synchronization

Organizationally, the Army possesses significant structure dedicated to the CWMD mission but is challenged in its ability to develop an integrated and synchronized approach across the Army staff and subordinate organizations. The current structure dedicated to the mission set lacks the appropriate level of senior leader CWMD advocacy, is narrowly focused and often stovepiped across disparate offices and commands, and lacks well established business practices to focus the effort. This fractured approach is preventing the Army from developing the appropriate strategies, plans, policies, force structure and capabilities to meet emerging 21st century CWMD threats.

Recommendations

CBRN Force Design Update (FDU)

The Army should undertake an FDU to restructure CBRN forces to be globally responsive and regionally engaged – with the objective of providing the Joint Force a flexible and scalable capability to support

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8. Chief of Staff of the Army Strategic Studies Group-I, "Testing the Assumptions about the Role of Land Power in 2030 Final Report," 17-20.

the response to WMD threats at home and abroad. The FDU should address how the Army can restructure CBRN forces to provide a mix of capabilities to conduct all hazard reconnaissance and assessment (mounted/dismounted); WMD exploitation and elimination; individual, mass casualty, equipment and fixed site decontamination; WMD consequence management; and field analytics. The FDU should also consider the role of general purpose forces and SOF in supporting WMD missions, and what, if any, DOTMLPF changes are required to support such efforts.

Regionally Aligned Forces

As the Army develops regional alignment strategies for Corps, Divisions and Brigade Combat Teams (BCTs) it must ensure equal diligence is given to aligning critical enablers. Specifically, the Army must be regionally postured with the appropriate mix of conventional, SOF and technical forces to meet rapidly emerging requirements for CWMD. Alignment should be supported by the requisite concepts of operation and DOTMLPF analysis for the synchronized and coordinated employment of conventional, SOF and technical assets.

Synchronize and Resource the CWMD Effort

If CWMD is a priority Army mission, then the CWMD effort must be adequately resourced. Resourcing begins at the top by establishing a Department of the Army Management Office with the appropriate business practices to oversee the synchronization and integration of the effort across and outside the Army. As part of the HQDA staff, the Office for CWMD, led by a general officer, should be the principal staff office responsible for the synchronization, integration, development and execution of CWMD functions, and the principal military advisor to the Secretary and Chief of Staff of the Army on CWMD matters. Functions should include non-proliferation; counter-proliferation and consequence management activities, to include the Army's role in the current eight CMWD mission areas: offensive operations, elimination operations, interdiction, active defense, passive defense, security cooperation, and threat reduction cooperation. To support the effort, the Army should also consider designating a specific TRADOC

Capability Manger (TCM) for CWMD to provide centralized management and user activities associated with CWMD.

Conclusion

At the end of the first decade of the 21st century, the Army recognizes the need to change to meet the changing character of war. An area of specific concern is the ability to counter weapons of mass destruction. With some specific changes to force structure, regional alignment of conventional, SOF and CWMD technical forces, and minor changes in staff organization and business practices, the Army can set the conditions to transform from an unwieldy Cold War era CBRN response force to a globally responsive, flexible and scalable CWMD force capable of leading DoD's efforts to actively prevent the acquisition and use of WMD.

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Divest the Army of the Standing BCT in Order to Create the Future Force

Colonel Kelly W. Ivanoff

Achanging global security environment demands commensurate preparation to protect future national interests. *Global Trends 2030: Alternative Worlds*, was published in late 2012 to "stimulate thinking about this rapid, vast array of geopolitical, economic, and technological changes transforming our world today and their potential trajectories over the next 15-20 years."[1] In the executive summary, the authors admit, "we do not seek to predict the future… but instead provide a framework for thinking about possible futures and their implications."[2] To this, they explore four "megatrends," six "game-changers," and four more "potential worlds" which may impact the global future.[3] Throughout the document their message is clear, "The world of 2030 will be radically transformed from our world today."[4]

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1. Christopher Kojm, introduction, in *Global Trends 2030: Alternative Worlds* (Washington, DC: National Intelligence Council, December 2012)

2. National Intelligence Council, executive summary, in *Global Trends 2030: Alternative Worlds,* i.

3. Ibid., ii.

4. Ibid., iii.

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Recognizing this rapidly changing world consisting of a "complex and uncertain security environment," the Army has recently initiated a number of comprehensive responses designed to "move forward with institutional reforms we know are necessary to ensure the Soldiers of today are prepared to fight and win tomorrow."[5] These reforms include: growing "Adaptive Army Leaders for a Complex World," establishing a "Globally Responsive and Regionally Engaged Army," building a "Scalable and Ready Modern Army," preserving "Soldiers Committed to Our Army Profession," and preserving the "Premier All-Volunteer Army."[6] These initiatives seem generally appropriate but the Army needs a bigger strategy that allows it to address the present while preparing for the future. Given these conditions, the Army must prepare for the future by acknowledging current global security and economic challenges, accepting strategic risk, and adapting the current force design to become more economically efficient while retaining core capabilities.

The first challenge the Army must acknowledge is the current economic environment. In 2010, Chairman of the Joint Chiefs of Staff, Admiral Michael Mullen, was quoted as saying: "The single biggest threat to national security is the national debt."[7] While some might disagree with Mullen's prioritization,[8] it is clear that fiscal challenges will constrain the Department of Defense for the foreseeable future. In 2012, the National Intelligence Council declared "The U.S. ability to maintain near-current levels of defense spending is open to serious question."[9] Nearly a year ago, Secretary of Defense Hagel stated in his April 2013 testimony to the House Armed Services Committee, "the new strategy calls for a smaller and leaner force."[10] More recently, the Quadrennial

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5. General Raymond T. Odierno, "The U.S. Army: Meeting the Nation's Strategic Priorities of the Future," *Army Magazine* 16, no. 10 (October 2013), 28.

6. Ibid.

7. Michael J. Carden, "National Debt Poses Security Threat, Mullen Says," *American Forces Press Services*, August 27, 2010, http://www.defense.gov/news/newsarticle.aspx?id=60621 (accessed March 20,2014).

8. Kevin Baron, "Dempsey: Debt not Biggest National Security Threat," *Stars and Stripes*, July 26, 2011, http://www.stripes.com/blogs/stripes-central/stripes-central-1.8040/dempsey-debt-not-biggest-national-security-threat-1.150194 (accessed March 20, 2014).

9. National Intelligence Council, *Global Trends 2030: Alternative Worlds*, 102.

10. Chuck Hagel, *Testimony to the House Armed Services Committee on the FY2014 Budget Request for the Department of Defense* (Washington, DC: April 11,

Defense Review (QDR) states, "the Department of Defense is…facing a changing and equally uncertain fiscal environment.…To protect the security interests of the United States…while recognizing the fiscal imperative of deficit reduction, the President's FY2015 Budget reduces projected defense budgets by about \$113 billion over five years compared to levels requested in the FY2014 Budget. The President's Budget provides a balanced and responsible path forward given continuing fiscal uncertainty."[11] For the Army, the message is clear: the current fiscal situation demands acknowledgement of the global security environment, acceptance of strategic risk and adjustments to the current force design to find economic savings.

Since 2012, the Army has reduced personnel-related costs in two primary ways. The most significant was the elimination of force structure by downsizing from 45 Brigade Combat Teams (BCTs) to 32.[12] Additionally, the Army conducted a major effort to reduce officer, warrant officer and enlisted grade structure, hoping for a savings of nearly \$1.9 billion.[13] Both of these steps were expected since they eliminated growth that occurred during the past decade-plus of war. Unfortunately, they eliminate significant capability while falling short of providing necessary fiscal relief to alleviate long-term budgetary concerns. For this reason, the Army continues to seek alternatives to achieve further savings.[14]

Dr. J. Thomas Moriarty offers a framework for consideration. He asserts that in the past, nation-states have employed five key elements to confront rising security challenges and extended periods of fiscal

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2013), http://www.defense.gov/Speeches/Speech.aspx?SpeechID=1768 (accessed March 20, 2014).

11. Chuck Hagel, *Quadrennial Defense Review* (Washington, DC: U.S. Department of Defense, March 2014), iv.

12. General Raymond T. Odierno, *Transcript, Department of Defense Briefing, public press conference* (Washington, DC: June 25, 2013), http://www.defense.gov/transcripts/transcript.aspx?transcriptid=5263 (accessed March 20, 2014).

13. Colonel Wade Yamada, Colonel Michael Linick and Mr. John Twohig, "Initial Grade Plate Council of Colonels," briefing slides with scripted and unscripted commentary (Washington, DC) conducted via VTC, June 5, 2013.

14. Daniel Wasserbly, "US Army Now Planning for Possibly Significant Budget Cuts," *Jane's Defense Weekly* 50, no. 38 (August 21, 2013).

uncertainty to sustain their global position in the international system.[15] Among these five elements are two that are directly appropriate for immediate consideration by the Army. The first is to reduce but accept short-term strategic risk and the other is to achieve defense efficiencies.[16] The application of these two elements will enable the United States Army to align strategic ends, ways and means to meet present security threats while generating manpower efficiencies to allow fiscal savings to be applied to preparation for the future.

With respect to accepting short-term strategic risk, the Army must acknowledge it is trapped by inconsistencies between Title 10 responsibilities and evolving national strategy. On one hand, Title 10, U.S. Code, directs the Army to be "organized, trained, and equipped for prompt and sustained combat incident to operations on land."[17] Army strategy is properly aligned to meet this requirement since the ends identified in Title 10 are supported by appropriate current doctrine and a suitable force structure consisting of 32 BCTs. On the other hand, the current National Security Strategy (NSS) contradicts Title 10 by directing a "rebalance [of] our military capabilities to excel at counterterrorism, counterinsurgency, stability operations, and meet increasingly sophisticated security threats, while ensuring our force is ready to address the full range of military options."[18] Additionally, the Defense Strategic Guidance (DSG) of 2012 identifies Ten Primary Missions of the U.S. Armed Forces[19] and the National Military Strategy (NMS) of 2011 establishes four national military objectives.[20] Ironically, the greater percentage of these missions and objectives focuses on scenarios other than decisive action combat operations which a BCT is designed to confront. If the Army assumes it must

15. Thomas J. Moriarty, II., "The Hegemon Strikes Back," lecture, U.S. Army War College, Carlisle Barracks, PA, February 18, 2014, cited with permission of Dr. Moriarty.

16. Ibid.

17. House Committee on Armed Services, Title 10, United States Code, http://armedservices.house.gov/index.cfm/title-10-usc (accessed March 20, 2014), 1710.

18. Barack Obama, *National Security Strategy* (Washington DC: The White House, May 2010), 14.

19. Barack Obama, *Sustaining U.S. Global Leadership: Priorities for 21st Century Defense* (Washington, DC: The White House, January 2012), 4-6.

20. Michael G. Mullen, *The National Military Strategy of the United States of America: Redefining America's Military Leadership* (Washington, DC: 2011), 4.

be able to execute both the directives in Title 10 and in the various national strategies, then it must also acknowledge that present ends, ways and means are no longer aligned because of the inefficiencies in retaining 32 BCTs which are not ideally constructed to confront the threats identified in the NSS, DSG and NMS.

With regard to defense strategy, Secretary of Defense Hagel was recently quoted providing strategic direction that the Army would be wise to employ. He called upon the services to re-evaluate the military force planning construct by reviewing and revalidating "assumptions and scenarios for which U.S. military forces organize, train and equip themselves."[21] He added the goal is "to ensure they better reflect our goals and the shifting strategic environment, the evolving capacity of our allies and partners, real-world threats, and the new military capabilities that reside in our force and in the hands of potential enemies."[22] In essence, the secretary sees a future similar to the one described by a number of agencies including the National Intelligence Council and Army Training and Doctrine Command. For this reason, the Army should acknowledge his guidance, accept short-term strategic risk and tailor the force to address missions and threats identified in the national security and defense strategies rather than remain focused on sustained decisive land operations.

The strategy to do so, while simultaneously achieving defense efficiencies, is found in divesting of the "standing" BCT. The BCT is, and should remain, the formation of choice for conducting decisive land operations. However, it does not provide efficiency in the utilization of manpower for the spectrum of missions and objectives identified in the DSG and NSS. Breaking the BCT by pooling Field Artillery and Engineer battalions into functional specialty brigades would produce greater manpower and economic efficiencies. These efficiencies could be achieved by eliminating an active duty engineer company from the Brigade Engineer Battalion in the BCT and one battery from the Field Artillery battalion. These reductions would equate to nearly 6,000 Soldiers or, almost two BCTs worth of personnel. Most importantly,

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21.Cheryl Pellerin, "Hagel: Six Priorities Shape Future Defense Institutions," *American Forces Press Service* (November 5, 2013) http://www.defense.gov/news/newsarticle.aspx?id=121054 (accessed March 20, 2014).

22. Ibid.

these reductions would allow the preservation of two BCT headquarters and associated subordinate battalions' worth of structure. By divesting of the standing BCT, pooling specialty skills in functional brigades would allow maximum training readiness of the companies, rapid task organization for mission-specific employment, and an efficient conduit for the integration of component two and component three companies as required for future operations. Additionally, employment of this method would allow maneuver brigades to better focus on preparing mission tailored forces for employment in the contemporary environment under the regionally aligned forces concept. It also preserves capability to rapidly expand, if necessary, and to address high risk, low probability conventional land threats in contemporary and future environments.

A RAND study published in 2000 described the difficulty in expanding the Army in a time of crisis by asking the question, from and with what?[23] Divestiture of the BCT with simultaneous elimination of some company structure through reliance upon the guard and reserve for these forces provides an answer to this question. The preservation of the maximum number of battalion and brigade headquarters in the active force has two noteworthy characteristics that contribute to this advantage. The first is the retention of a large base of senior officers and noncommissioned officers. The second is the potential for rapid expandability. The same RAND study offered that the primary constraint to expanding the Army is training, specifically "advanced training at the brigade and division levels."[24] The retention of many brigades that can expand rapidly is more advantageous than the retention of a few full strength BCTs.

Divestiture of the standing BCT finds another advantage in the optimization and employment of the total force. The 2013 Army Strategic Planning Guidance states: "We will leverage the capacity and capabilities of the Total Force – Active, Guard, Reserve and Civilian – ensuring that both the operational and generating forces are optimized and aligned to support Department of Defense (DoD) and Army

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23. James A. Dewar, Steven C. Bankes, Sean J. A. Edwards, and James C. Wendt, *Expandability of the 21st Century Army* (Washington, DC: RAND, 2000), 27.

24. Ibid., xxiii.

strategic priorities."[25] Yet history shows that "mobilizing reserve forces, particularly ground combat forces, has often been problematic."[26] Here, the advantage is obtained through routinely practicing aggregation and/or disaggregation of formations to build mission ready, tailored, deployable forces. The routine practice enhances this particularly difficult skill and thus enables efficient integration of the guard and reserve forces.

Divesting of the standing BCT has a perceived cost to unit cohesion. The United States Army Operating Concept: 2016-2028 states "Army brigades are organized with an expanded set of organic capabilities to enhance unit cohesion, give them the greatest combat effectiveness, and the ability to respond to fleeting opportunities and unforeseen dangers."[27] Few would argue against the theory that the standing BCT enables greater unit cohesion and readiness through individual and organizational familiarity. The problem is that current fiscal constraints do not afford the luxury of 32 standing BCTs. To become more efficient in the contemporary environment, the Army must abandon the paradigm that "train as you will fight"[28] equals the retention of 32 standing BCTs consisting of the full complement of enabling capabilities permanently assigned.

Ultimately, the Army must review its force design to align it with current and expected mission profiles. Global economic challenges constrain the luxury of designing and maintaining 32 BCTs that do not optimally employ every member of the team. It is prudent of the Army to maintain capability and readiness for worst-case, greatest risk scenarios. On the other hand, it is not fiscally responsible to maintain that capability in 32 standing active component BCTs. Given these

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25. John M. McHugh and General Raymond T. Odierno, *Army Strategic Planning Guidance* (Washington, DC: U.S. Department of the Army, 2013), 1.

26. Bernard Rostker, *Right-Sizing the Force: Lessons for the Current Drawdown of American Military Personnel* (Washington DC: Center for a New American Security, June 2013), 5.

27. Martin E. Dempsey, *The United States Army Operating Concept: 2016-2028*, TRADOC Pam 525-3-1 (Fort Monroe, VA: Department of the Army, Headquarters, United States Army Training and Doctrine Command, August 19, 2010), 18.

28. General Raymond T. Odierno, *Training Units and Developing Leaders*, ADP 7-0 (Washington, DC: U.S. Department of the Army, August, 2012), 5.

conditions, the Army should divest of the BCT-centric design for a flexible, adaptable, scalable capabilities-centric design. Doing so would provide significant economic savings to both the Army and the Department of Defense and contribute to a better defense strategy.

Army 2025 as "Landpower+": The Survivable All-Domain Joint Capability

Dr. Peter G. Laky

While the world may experience significant changes between now and the year 2025, the United States' values and enduring interests will not change significantly. The Future Army of 2025 must remain prepared to fulfill its roles and missions as part of the Joint Force – providing the military means to enable the United States' national security strategy, while complementing and reinforcing the diplomatic, economic and information elements of national power. While the future cannot be predicted, it will be met with or without preparation. The Army and the Joint Force it supports *will* shape itself towards 2025 based on the best analysis of the future operational environments (OEs) and required capabilities to meet national security strategies.

Reasonable assumptions about the types of OEs that the Joint Force will face in 2025 set conditions for an examination of the range of roles and missions for which the Army should be prepared to execute. Such an analysis supports shaping an Army for 2025 that remains prepared to exert landpower across the full spectrum of conflict from defeating large conventional landpower threats, such as Russia or North Korea on the high end of the conflict spectrum; to supporting persistent, long-

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term low-intensity counter-terrorism (CT) and counter-insurgency (COIN) missions on the low end of the conflict spectrum. This analysis also suggests that the Army's "non-platform" qualities and land force capabilities of survivability through dispersion, mobility and human endurance will gain importance in the OEs of 2025 and beyond. ***For this reason, the Army should prepare to execute significantly increased Joint Force roles and missions in setting, shaping and supporting theaters of war, and projecting power in the sea, air, space and cyber domains in order to mitigate the most dangerous emerging asymmetric Joint Force threats of 2025 and beyond.***

The only real consensus on strategic environment of 2025 and beyond is that it will present the possibility of a full range of conventional and hybrid threats anywhere in the world.[1] We know from current events that conflicts judged to be very low probability events even in near-term projections, such as a Russian military intervention in a major neighboring Eurasian country, can actually and unexpectedly occur.[2] This implies that in order for the U.S. Army to support the Joint Force in meeting the national security strategies of 2025 and beyond, it must retain the capabilities to provide dominant landpower across the full spectrum of conflict in the land domain. It must also have sufficient *capacity* to prevail in multiple simultaneous conflicts against potential adversaries, which, by 2025, could include a range of large and medium-sized countries such as China, Iran, and North Korea.[3] This *landpower dominance* requirement in 2025 does not represent a significant change from the Army of 2014, but it is important to establish the baseline requirements for the Army to retain overmatch in the land domain because the OE of 2025 and beyond will likely also require the Army to generate *new capabilities* beyond landpower dominance. The balance of this analysis will focus on these additional capabilities.

Although the OE of 2025 is likely to be ambiguous, there is also considerable consensus that our adversaries will continue to develop the capabilities required to deny U.S. and allied forces a permissive

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1. Training and Doctrine Command (TRADOC) G2, *Operational Environments to 2028: The Strategic Environment for Unified Land Operations* (August 2012), 13, 17.

2. Alison Smale and David M. Herszenhorn, "Kremlin Clears Way for Force in Ukraine; Separatist Split Feared," *New York Times* (March 1, 2014).

3. TRADOC G2, *Operational Environments to 2028*, 29-31.

access environment and freedom of movement and maneuver within an Area of Responsibility (AOR). Our adversaries have observed U.S. forces exploit permissive access to regions of conflict and thus a growing number of them are acquiring capabilities to deny the U.S. forces uncontested access in the future. This growing Anti-Access/ Area Denial (A2/AD) threat is well documented.[4] A2/AD *means* are generally characterized by increasingly sophisticated and numerous long range precision rocket and missile forces as well as integrated air defenses and fighter air combat capabilities. A2/AD threat *asymmetry* is achieved against U.S. forces by presenting regional/local quantitative overmatch in threat systems and highly unfavorable loss exchange costs such as precision missiles against naval vessels. While the OEs of 2025 may be ambiguous, the Joint Force *must* assume a significant A2/AD threat component to it.[5] The key consequence of the growth of this A2/AD OE is an increasing threat to U.S. power projection and strike platforms in the air, sea, space and cyber domains. U.S. strategies underpinned by platform-centric power in these domains will accrue increasing risk as will strategy which relies on projection of U.S. landpower into a contested theater.

Because of the unique capabilities of the U.S. Army and land forces in general, a solution to the growing strategic risk due to reliance on platform-based capabilities is to shift a greater share of the military component of theater strategy to the Army.[6] Land forces possess enduring characteristics and capabilities which devalue threat investments in long-range precision A2/AD systems. Land forces have the ability to disperse in complex terrain and use mobility, deception and hardened shelters to achieve superior survivability compared to

4. Air-Sea Battle Office, *Air-Sea Battle: Service Collaboration to Address Anti-Access & Area Denial Challenges* (Washington DC: Department of Defense, 2013), 2; Jan van Tol, et al., *AirSea Battle: A Point-of-Departure Operational Concept* (Washington, DC: Center for Strategic and Budgetary Assessments, 2010), 24-26.

5. Andrew Krepinevich, Barry Watts and Robert Work, *Meeting the Anti-Access and Area-Denial Challenge* (Washington, DC: Center for Strategic and Budgetary Assessments, 2003), 3-5; John Gordon and John Matsumura, *The Army's Role in Overcoming Anti-Access and Area Denial Challenges* (Washington, DC: Rand Corporation, 2013), 1-9.

6. Peter G. Laky, "Land Force Roles in the Western Pacific Anti-Access/Area Denial Environment," *Strategy Research Project* (Carlisle Barracks, PA: U.S. Army War College, April 15, 2014), 2. This recommendation is the thesis of my SRP.

air and sea platforms.[7] Many Joint Force platforms have significant in-combat survivability capabilities, but they must eventually land, berth or conduct ship-to-ship operations to rearm and refuel opening critical windows of vulnerability. Land forces also possess superior *endurance*. Short of nuclear fires, land forces are very difficult to attrit at long range.[8] While it may be easier to disrupt land force operations than it is to destroy the land forces themselves, land formations are capable of continuous reconstitution of capability, even *in situ*, within the limits only of logistics and leadership. These land force characteristics thwart the anti-platform focus of emerging A2/AD threats.

Any joint force capability that does not absolutely require platform-based power to accomplish should be allocated wholly or substantially to the Army in order to exploit land force survivability advantages which negates threat A2/AD investments and represents a cost imposing strategy on potential adversaries. In addition to the traditional landpower role, survivability and counter-A2/AD characteristics significantly increase land force utility to provide key non-landpower Joint Force capabilities in the A2/AD OE of 2025. Some of these key missions are already in the Army's charter, but some are only partially Army responsibilities, depending on the theater, and some of these roles are currently designated for other services. To leverage the value to the Joint Force of land force survivability advantages, the Army of 2025 should possess the capabilities to set and prepare theaters of war, provide theater air defenses, <u>and</u> establish, maintain and regenerate essential cyber and space-based Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) capabilities. Finally, in maritime theaters such as the Western Pacific, the Army of 2025 should also possess mobile missile launchers to explicitly exert maritime power.

The Army of 2025 should project greater power in the air domain. The U.S. Army already provides substantial support to the joint force in ballistic missile and theater air defenses. The Army of 2025 should assume all land-based theater missile and air defense missions <u>consolidating a</u> role now split between services. U.S. Army War College

7. Thomas G. Mahnken, "Weapons: The Growth and Spread of the Precision-Strike Regime," *Daedalus* 140, no. 3 (Summer 2011), 52-53.

8. Ibid.

Professor John R. Deni notes that U.S. allies strongly desire the Army's current ballistic missile and air defense capabilities.[9] This demand signal should increase in 2025 and beyond in response to the increased ballistic missile and offensive air threats characteristics of the emerging regional A2/AD OEs. Such support to allies enables setting important theater protection conditions for friendly force projection and also offers critical opportunities for persistent forward presence and shaping engagement with allies and partners, most of whom have land force-centric national defense systems for domestic security reasons.[10] Finally, by 2025 the Joint Force, including the Army, should be equipped with mobile Directed Energy (DE) capabilities which will greatly enhance protection by largely liberating air defense targeting from ammunition constraints and multiple simultaneous target overmatch.[11]

The Army of 2025 should revive an historical role and overtly project sea power by acquiring anti-ship, anti-submarine and long-range surface to surface missile capabilities. Many analysts have recommended that the Army develop this capability, arguing the counter-A2/AD advantages of equipping land forces with anti-ship missiles (ASMs) as a "non-platform" means to defeat Chinese power projection in the Western Pacific.[12] This sea power fires capability would be completely consistent with and complementary to the Army's existing air power and landpower fires roles. Equipping the Army with mobile, long-range, multi-role missile launchers would also represent a true convergence of the joint fires concept, leveraging the synergy of a holistic joint C4ISR network, truly enabling the Joint Operational Access Concept.[13] Serendipitously, aggravated Russian belligerence

9. John R. Deni, "Strategic Landpower in the Indo-Asia-Pacific," *Parameters* 43, no. 3 (Autumn 2013): 80-81.

10. Ibid., 82.

11. Mark Gunziger and Christopher Dougherty, *Changing the Game: The Promise of Directed-Energy Weapons* (Washington, DC: Center for Strategic and Budgetary Assessments, April 2012), 21-23.

12. Terrence K. Kelly et al., *Employing Land-Based Anti-Ship Missiles in the Western Pacific* (Washington, DC: Rand Corporation, 2013), 3-6; Jim Thomas, "Why the U.S. Army Needs Missiles: A New Mission to Save the Service," *Foreign Affairs* 92, no. 3 (May/June 2013), 140-142; Deni, "Strategic Landpower," 79.

13. U.S. Department of Defense, *Joint Operational Access Concept (JOAC)*, Version 1.0 (Washington, DC: U.S. Department of Defense, 17 January 2012), 14-17.

against Ukraine in 2014 offers the U.S. an opportunity to walk away from the Intermediate-Range Nuclear Forces Treaty which currently restrains the Army from acquiring these capabilities.[14] Potential adversaries such as China and allies such as Japan who have not been so constrained have already acquired these land force *sea fires* capabilities resulting in a significant U.S. capability gap relative to our allies and potential adversaries.[15] The Army of 2025 should eliminate this gap.

The Army of 2025 should assume primacy in theater cyber capabilities. The first requirement in cyber operations is to establish and maintain a viable network to enable essential joint C4ISR. Many of our potential adversaries are developing the capabilities to attack our terrestrial, airborne and space-based network components as well as capabilities to deny use of the cyber commons.[16] Land forces are advantageously positioned to harden terrestrial portions of the network, provide multiple redundant backup capabilities to key network components, and to deploy the means to regenerate lost portions of the non-terrestrial network. Deployment, operation and recovery of Unmanned Aerial Systems (UAS) is a primarily land-based function, and UASs provide a method of establishing key network and other salient capabilities supporting joint force C4ISR.[17] Finally, setting cyber conditions in shaping phases of theater operations offers additional opportunities for the Army of 2025 to engage partners and allies to build combined capabilities and establish key C4ISR interoperability.

The Army of 2025 should exert power in the space domain. The space domain of 2025 will likely be more cluttered, increasingly contested and possibly overtly militarized.[18] But many of the capabilities to establish, maintain and regenerate cyber capabilities are common to

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14. Thomas, "Why the U.S. Army Needs Missiles," 140.

15. Sun Xiabo, "Japan Deploys Missiles on Strategic Strait," *Global Times* (November 7, 2013) http://www.globaltimes.cn/NEWS/tabid/99/ID/823106/Japan-deploys-missiles-on-strategic-strait.aspx (accessed January 8, 2014); van Tol, et al., *AirSea Battle*, 18.

16. David C. Gompert, *Sea Power and American Interests in the Western Pacific* (Washington DC: Rand Corporation, 2013), 8, 108; van Tol, et al., *AirSea Battle*, 23.

17. Michael D. Swaine, et. al., *China's Military & the U.S.-Japan Alliance in 2030* (Washington DC: Carnegie Endowment, 2013), 137.

18. Ibid., 23.

those required to replenish required support and services currently provided by satellites in the space domain. Land-based UAS fleets offer a means to mitigate loss of many space-based capabilities.[19] In addition to providing assured cyber and space-based services, the Army of 2025 should also possess offensive space power employing mobile, land-based DE systems, possibly the same systems enabling DE air defenses.[20]

All land force missions are significantly enhanced by a persistent forward presence. Persistent forward presence into projected Areas of Operations, even at modest levels of small "torch" teams, prepares Army units and host nation partners psychologically, operationally and logistically. The Army of 2014 is taking steps to achieve this presence through Regionally Aligned Forces.[21] With increased roles and missions in air and missile defense, joint fires including maritime fires, cyber operations and assured space-based services, the Army of 2025 will have significantly increased opportunities, even imperatives, for persistent theater presence to set conditions for execution of these additional functions. Presence driven by additional joint force roles will *reinforce* the forward presence driven by the Army's global landpower mission. This aggregate increase in land force presence in theaters of operations, even at modest levels, will reinforce the credibility of regional deterrent strategies.[22]

The Army of 2025 should leverage the key advantages of land force survivability through mobility, dispersion and endurance to assume a significantly increased share of joint force roles in the air, sea, cyber and space domains. By shifting these missions to the Army, the Joint Force will decrease platform-based strategy risk significantly mitigate the expected A2/AD OE of 2025, and implement a cost-imposing strategy on potential opponents. The Army of 2025 must retain global landpower overmatch as its primary mission for the Nation, but the enhanced and new Army joint capabilities and missions will serve as the cornerstone of a more capable and survivable joint force. In the contested power projection OE of 2025, this reallocation of joint roles

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19. Ibid., 160.

20. Gunziger and Dougherty, *Changing the Game*, 48.

21. U.S. Army, *The Army Strategic Planning Guidance, 2013*, 1.

22. Huba Wass de Czege and Antulio J. Echevarria II, "Landpower and Future Strategy," *Joint Force Quarterly* 21 (Spring 1999), 64.

to more survivable land forces is essential to successful implementation of the Joint Operational Access Concept (JOAC) in order to enable world-wide deployment of decisive military force. Hence, the Army of 2025 will become "landpower Plus (LP+);" the preeminent landpower in the world and the survivable and agile all-domain foundation to the Joint Force.

A Strategy for the Next Infantry Fighting Vehicle

Colonel James W. Schirmer

In the particularly harsh winter of 2014, the Army's latest attempt at combat vehicle modernization died quietly. The Army requested $592 million for fiscal year 2014, but Congress passed a budget that provided only $100 million; funding at a level necessary to begin closing the program down.[1] Defense Analyst Loren Thompson of the Lexington Institute penned an article for Forbes magazine appropriately titled "Army Modernization is Melting Down." Thompson pointed out that since 2009, the Army has cancelled its flagship Future Combat System (FSC) program, the armed reconnaissance helicopter, the Non-Line of Sight Cannon, both of its next generation air defense programs, and finally the "must have" Ground Combat Vehicle (GCV).[2] At around the same time, the Fort Benning queried industry about its ability to produce an "Ultra-Light Combat Vehicle" that could carry a

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1. Paul McCleary, "US Army's GCV Program Downgraded To Study Project," *Defensenews online* (January 18, 2014) http://www.defensenews.com/article/20140118/DEFSECT02/301180024/US-Army-s-GCV-Program-Downgraded-Study-Project (accessed 23 March 2014).

2. Loren Thompson, "Army Modernization Is Melting Down," *Forbes Online* (January 13, 2014) http://www.forbes.com/sites/lorenthompson/2014/01/13/army-modernization-is-melting-down/ (accessed 21 March 2014).

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nine-man squad, fit inside a CH-47, and be air dropped from a C-130.[3] Dr. Daniel Goure of the Lexington Institute remarked, "The Army's inability to deliver on a new armored fighting vehicle may also reflect a bigger problem: its ever-changing concept of future land warfare. The Army has radically changed its views on land warfare at least three times over the past decade."[4]

The Army is involved in an internal debate about the role of the Army, and how it strikes a balance between readiness for Decisive Action and the need to retain the hard-won lessons of counterinsurgency. The tension between the two has created a challenging environment for building consensus on the type of capability the Army needs, particularly with respect to the mechanized portion of the force. The FCS was designed to fight a near peer competitor in high intensity combat, and its cancellation was often attributed to the lack of protection from Improvised Explosive Devices. Although the tension between deterring state-on-state violence and being prepared for counter-insurgency is a real one, it need not halt efforts in combat vehicle modernization. As Lieutenant General H.R. McMaster, Training and Doctrine Command (TRADOC), recently argued, armored forces are useful for deterring state actors, insurgents, as well as hybrid threats.[5] In order to launch an effort that ultimately bears the fruit of capability to the force, the Army needs to manage three ingredients – ***consensus, the requisite technology, and timing.***

The first ingredient, and perhaps the most difficult to obtain, is consensus about what the Army needs. The broad Army requirements of an Infantry Fighting Vehicle (IFV) are clear – an IFV that is smaller, well protected, mobile, and modular. However, the Army's <u>need</u> for an infantry vehicle is sometimes debated because it may not be obvious.[6]

3. Daniel Goure, "U.S. Army Combat Vehicle Plans Careen From Heavy GCV To 'Stryker Lite,'" *Early Warning Blog online* (January 30, 2014) at http://www.lexingtoninstitute.org/u-s-army-combat-vehicle-plans-careen-from-heavy-gcv-to-stryker-lite/.(accessed 21 March 2014)

4. Ibid.

5. Chris McKinney, Mark Elfendahl, and H. R. McMaster, "Why the U.S. Army Needs Armor, The Case for a Balanced Force," *Foreign Affairs* (May/June, 2013), 129-136.

6. During the summer of 2010, TRADOC created "Task Force 120" whose purpose was to generate requirements for a new ground combat vehicle in the wake

Although unlikely in the near and mid-term, the functions of today's tanks and self-propelled artillery could conceivably be carried out by unmanned vehicles, either as part of manned/unmanned teaming or in remotely piloted or autonomous roles. But in the conflicts that the Army of 2030 and beyond may have to fight, there will always be a need for human interaction. Wars in the future will be fought by people, between people, and among people. Robots may provide assistance in many tasks, but interacting with locals, building trust, training indigenous forces, capturing and interrogating prisoners, and compelling behavior must be done by Soldiers on the ground. These Soldiers will need the mobility and protection of an IFV to get them to the decisive point, as well as firepower to back them up.

Since the most important mission of an IFV is transporting Soldiers, carrying capacity is critical and perhaps the most controversial capability. In the FCS, Stryker, and later GCV programs, the 9-man squad was the standard and was codified as a Key Performance Parameter (KPP). This requirement should be revised downward. The need to carry a 9-man squad, combined with robust protection requirements, drives the vehicle to an undesirable size and weight. The GCV prototypes were in the 70-ton range and, barring a truly revolutionary development in materials science, that number is unlikely to come down significantly without a reduction in volume under armor. On the other hand, a larger number of smaller vehicles would provide a several advantages. First, regardless of how well protected a combat vehicle is, there will always be instances of overmatch. Large infantry vehicles with large

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of the cancellation of the Future Combat System. The Secretary of Defense at the time (Robert Gates) had promised to fence the Army funding associated with FCS while awaiting a thorough relook of the requirements. The task force got its name from the number of days it had to produce a document in time for the Program Objective Memorandum (POM) review in the fall of 2010. At the time, there was a lively debate between those who thought the funding should be used for a family of support vehicles to replace the M113, those that thought it should be focused on a command and control platform capable of carrying Warfighter Information Network-Tactical (WIN-T) and other key elements of the network down to the company, and those who thought it should be an IFV to replace Bradley. The IFV camp won, largely because an infantry carrier was the most challenging in terms of size, weight, and power so if an infantry carrier could be built successfully the chassis would have been more than robust enough to support later efforts to build other variants on a common chassis. The author participated in Task Force 120.

numbers of Soldiers will result in catastrophic casualties. Secondly, there are significant increases in strategic and operational mobility with a smaller vehicle fleet. In addition to fitting on smaller airframes, a smaller vehicle can be transported by rail or truck with fewer restrictions. Operational mobility improves because the number of roads, bridges, and tunnels that can support a vehicle increases as the gross vehicle weight comes down. Finally, in the increasingly urbanized world of 2030 and beyond, the Army must be able to enter the narrow streets and alleys of potentially sprawling megacities as well as remote villages. The width and length of a vehicle can significantly hamper its ability to move in these environments.[7]

The next IFV must be designed to be modular. This means that the base vehicle should be designed to accept several pre-defined mission packages. One example would be armor. The base vehicle should be able to stop small arms and light machinegun fire. This low-level protection would be adequate for a number of missions in homeland defense, humanitarian assistance, and building partner capacity in low threat areas. Conducting home station training at this lower protection level would reduce cost per-mile in both fuel consumption and repair parts. However, when the mission and threat require, additional armor packages could quickly be mated to the vehicle. A similar approach could be taken with other items such as sensors. With advanced capabilities such as the third generation Forward Looking Infrared Radar (FLIR) adding significant costs, every vehicle may not be equipped with (nor require) the technology. Taking a modular approach to design would allow decisions about specific additive capabilities (like FLIR) to be made later, potentially after fielding.

In order to best achieve vehicle modularity, the government should develop the interface that dictates how the two systems mate (the

7. As an anecdote, one battalion in 1-25 Stryker Brigade Combat Team removed their Slat armor in Afghanistan in 2011 because there were several villages they could not traverse due to the width of their vehicles with the armor on. This of course made them vulnerable to RPG attack, but the tradeoff in mobility was considered more important by their commander given the mission and threat at the time. The GCV prototypes were wider (5 meters wide for the BAE version) than a Stryker with slat armor attached (3.74 meters wide). GCV width was obtained from http://www.army-technology.com/projects/ground-combat-vehicle-gcv/. Stryker width was obtained from http://defense-update.com/products/s/slat-stryker.htm.

FLIR sensor and the vehicle, for example). This would be a change in practice from the traditional approach, which has been to award a single vendor a contract to produce a complete system capable of achieving all of the requirements. By developing and managing integrated concept development, the Army would have the opportunity to hold separate competitions for some of the modules. Some of these competitions could be held well after the vehicle is fielded. This is important because too often the Army pays large sums to a prime vendor simply to integrate an innovative system developed by a third party. Additionally, major weapons platforms like tanks and IFVs are likely to remain in the inventory for 50 or more years. In order to retain a technological advantage on the battlefield, these systems will likely receive upgrades to sensors, communications systems, electronic warfare devices, etc., a half-dozen times or more during their lifetime. Accounting for this inevitability in the initial design will save down the road.

The Army should take these basic elements and begin building a consensus. This effort should be led by TRADOC and will likely require a robust experimentation effort to help quantify the benefits of different levels of capability. The results of these experiments should be published by TRADOC and socialized among the senior leadership. TRADOC should seek to resolve debates about the broad requirements of the system well before pen is put to paper on an actual requirements document.

The next key ingredient is timing – when to go forward with the requirement and initiate a formal program. There are two elements to the timing decision; availability of funding and the need for a new start. Funding is the easier question to answer. As the Army draws down, the need to protect readiness is paramount. This is because the Army could be called to respond to a crisis at any time, but also because the readiness dollars of today are the training repetitions that will build the skills of the leaders of tomorrow. With the speed of the personnel drawdown limited by statute and the desire to protect morale, the budget will not have room for a new start IFV until 2018 at best, and more likely, even later. Figure 1, located on the next page, depicts the funding timeline.

The line decending from left to right depicts the drawdown of active Army end-strength, which is planned to hit 490,000 Soldiers in FY15,
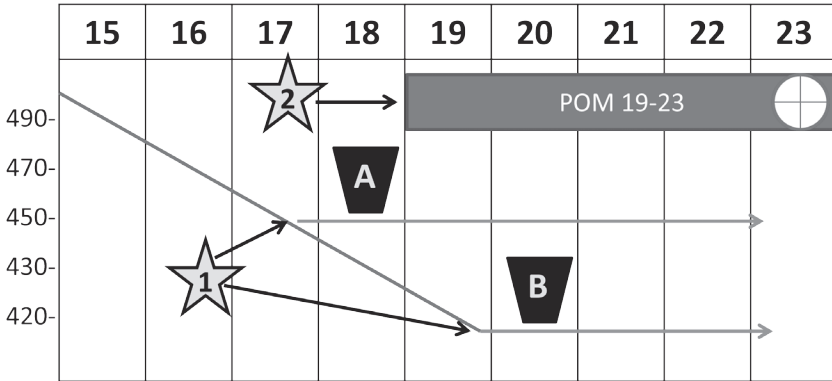
Figure 1. Earliest Possible Funding Windows for a Future IFV Program

but could go as low as 420,000 by FY19 if Congress does not provide relief from sequestration.[8] The first horizontal line shows force structure leveling off at about 450,000 in 2017. In this scenario, there would be some room for increased spending on modernization in 2018, represented by wedge A. If sequestration is not lifted by Congress, then the earliest possible start date would be wedge B. Decision Point 1 represents when Congress must act to lift Sequestration. During the late summer and fall of 2016 they will be deliberating the FY17 budget submission. At that point, it will be too late to make major changes to the FY18-22 Program Objective Memorandum (POM) which will already be at the Office of the Secretary of Defense. Decision Point 2 represents the Army's POM submission for FY19-23, which will be the first submission where the Army will likely know the impact of Sequestration, and FY23, the "target" date when funding could be placed against an IFV project with minimal disruption to other programs.

The timeline above really identifies a "not earlier than" date for beginning an IFV program – in this case the FY19-23 window. But the more important issue is whether it is better to replace the Bradley or continue making incremental improvements? There are already modest efforts underway to improve protection and mobility for the

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8. Dan Egbert, "Force Management Update USAWC Futures Seminar," briefing slides with scripted commentary, Carlisle Barracks, PA, U.S. Army War College, March 10, 2014.

Bradley that cost significantly less than building a new vehicle. The differential centers on developments in protection capabilities. If there is a significant breakthrough in material science that would allow a new vehicle to be built with superior protection at a significantly reduced weight (and at an affordable cost), the advantages of such a platform would be worthwhile. The structure of the Bradley today may not allow for such new materials to be incorporated in an economical manner. Although less compelling than a materials science breakthrough, a significant improvement in Active Protection Systems (APS) could also conceivably allow the Army to switch to a much lighter platform while improving protection. APS is less compelling simply because an APS system could be integrated onto existing Bradleys, MRAPS, or Strykers, which in turn could allow elimination of the various protection kits (Slat armor and reactive armor tiles) that have driven up vehicle weight significantly. Although this would do little to improve strategic mobility, it could nevertheless be done for a fraction of the cost of a new IFV. A final potential rationale for a new start IFV would be some unforeseen issue with the existing Bradley, most likely caused by age. If, for example, the Army determined that 40 year-old Bradley hulls were experiencing cracking or severe corrosion that threatened structural integrity or protection, the cost of addressing such a problem might make switching to a new vehicle more attractive.

The key for the Army in the near term is to focus its investments in science and technology in these two areas (materials science and
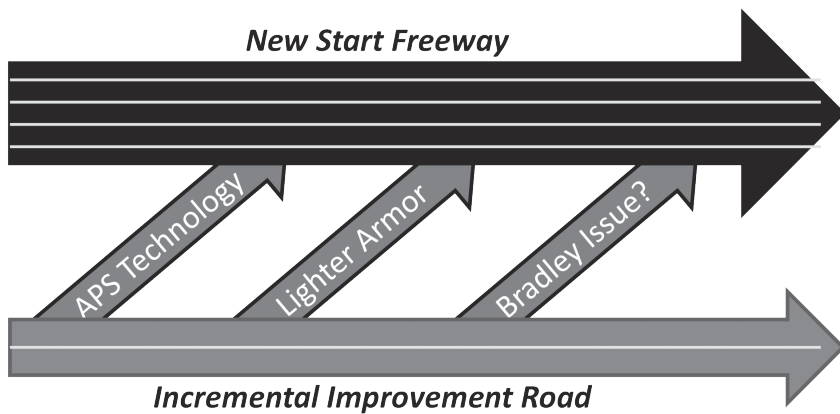

Figure 2. Potential On-Ramps to a New Start Infantry Fighting Vehicle

APS), while continuing to invest in more modest improvements to the existing platforms to keep them relevant. It is important for the Army to be patient. *Absent a compelling threat, the service should not initiate a new start until the requisite technologies are mature enough for a low to moderate risk program.*

In conclusion, the Army needs to learn a few important lessons from the failures of the recent past in order to devise a successful strategy for the next IFV. First, it needs to build a consensus inside (and outside) the Army as to the true IFV requirements. This work can and should begin now with a robust modeling and experimentation effort to nail down the benefits of different levels of capability in the areas of mobility, firepower, protection, and sensors. This effort should also look at organizations and doctrine, particularly the four vehicle platoon and the 9-man squad. Breaking the 9-man squad into two different vehicles is unpopular in the infantry community due to the challenges of linking up under fire. But the size and cost of a vehicle that can adequately protect a 9-man squad is prohibitive. Data from experimentation should be able to help quantify the relative benefits of different organizational constructs and help to pave the way for a consensus. In parallel, the Army should focus it's science and technology efforts in those areas of protection that are most likely to yield breakthroughs that will allow for superior protection and greatly reduced weights. Until those efforts bear fruit, the Army must continue to make modest investments in the current fleet to maintain its technological edge and buy time for continued technology maturation.

Operations in Megacities: The Future Modular Force 2025 and Beyond

Colonel Eric M. McFadden

The guerrilla must move amongst the people as a fish swims in the sea.

—Mao Zedong

Increased masses of people migrating to urban areas create significant stress on city management systems, escalating the potential for catastrophic failure. These massive, sprawling urban environments, categorized as megacities will pose significant operational challenges for the future force of 2030 and beyond. The application of landpower across this dynamic human domain will require a comprehensive operational approach, supported by the capability and capacity to address the root causes of instability and enable the host nation government to balance the systems of the megacity.

The world's population is expected to reach 8 billion by 2030 with the overwhelming increase (95 percent) concentrated in the developing world.[1] To absorb this dramatic population growth, the world

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1. *Global Trends 2030: Alternative Worlds* (Washington DC: National Intelligence Council, December 2012) iv, http://www.dni.gov/index.php/about/organization/global-trends-2030 (accessed 17 March 2014).

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will increasingly become more urban. By 2030, the current urban population of 3.6 billion will swell to 5 billion and 60 per cent of the world's population will live in cities.[2] The rise in urban population drives significant sprawl in the geographical size of the urban environment, creating complexities and bringing challenges to local and regional governments. This amorphous urban form is categorized as a megacity and is defined by the United Nations as "the concentration of more than 10 million inhabitants."[3] Today, twenty-four megacities exist and by 2025 at least twenty-seven cities will be classified as megacities.[4] This population migration has pushed many of the systems of these megacities beyond their capacity and, as a result, urban sprawl has developed into ungoverned spaces. Many megacity dwellers, living in slums on the fringes of the urban margin, will have limited access to education, health care or the urban economy. These settlements will have insufficient housing, inadequate sanitation and will often be beyond the influence of national law and order authorities.[5]

The nature of the megacity ungoverned spaces are ripe for exploitation by non-state actors such as terrorists, insurgents, criminals and extremist organizations. According to David Killcullen, "[b]ecause of heavier urbanization and greater connectedness, non-state armed groups will be increasingly able to draw on the technical skills of urban populations whose access to and familiarity with advanced technologies greatly enhance their military potential."[6] In order to survive, these threats will leverage informal economies and create resilient organizations. John Arquilla and David Ronfeldt label this threat approach as netwar

2. Population Division of the Department of Economic and Social Affairs of the United Nations, "World Urbanization Prospects, the 2011 Revision", 2012, 4, http://esa.un.org/unup/ (accessed 17 March 2014).

3. *Megacities* (European Association of National Metrology Institutes (EURAMET, January 2013) http://www.emrponline.eu/call2013/docs/MegaCities.pdf (accessed 13 March 2014), 1.

4. P.H. Liotta and James Miskel, *The Real Population Bomb: Megacities, Global Security and the Map of the Future* (Dulles, Virginia: Potomac Books, 2012), 2.

5. *The Future Land Warfare Report 2013* (Australian Army, Canberra, 2013) http://www.army.gov.au/Our-future/Research/~/media/Files/Our%20future/DARA%20Publications/Future%20Land%20Warfare%20Report%202013.pdf (accessed 18 March, 2014), 4.

6. David Kilcullen, "Future Cities, Future Threats," in *Out of the Mountains: The Coming Age of the Urban Guerilla* (New York: Oxford University Press, 2013), 104.

and state, "[t]he term netwar refers to an emerging mode of conflict (and crime) at societal levels, short of traditional military warfare, in which the protagonists use network forms of organization and related doctrines, strategies and technologies attuned to the information age."[7] Additionally, Saskia Sassen highlights that "besides their local criminal activities, they now often run segments of global drug and arms dealing networks; and, importantly, they are also increasingly taking over 'government' functions: 'policing', providing social services and welfare assistance, jobs and new elements of rights and authority in the areas they control."[8]

Given the complexity of megacities as a future operating environment and the proliferation of numerous threats, the future force of 2030 and beyond will require new and diverse capabilities and significant development of capacity in little-understood areas. Specifically, future force planners must address the problem:

How can the Army, as part of a Coalition, Joint, Interagency, Inter-governmental team, effectively operate in megacities in order to enable the national, regional and local governments to effectively address their root causes of instability, to create and balanced and resilient governance systems, while at the same time preserving U.S. national interests.

To address this complex problem set, we will use the Three Block War approach to guide the concept. General Charles C. Krulak, the 31st Commandant of the U.S. Marine Corps, in a speech to the National Press Club, stated: "In a moment of time, our service members will be feeding and clothing displaced refugees…the next moment, they will be holding two warring tribes apart…and finally, they will be fighting a highly lethal mid-intensity battle – all on the same day…all within three city blocks."[9] Although the character and conduct of war continues to evolve, the Three Block War construct has applicability to megacities.

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7. John Arquilla and David Ronfeldt, Networks and Netwar: The Future of Terror, Crime and Militancy (RAND, Santa Monica, CA, 2001), 6.

8. Saskia Sassen, *When the City Itself Becomes a Technology of War, Theory, Culture & Society* (SAGE 27 (6), 2010, Los Angeles, London, New Delhi and Singapore) http://www.saskiasassen.com/PDFs/publications/When-the-City-Itself-Becomes-a-Technology-of-War.pdf (accessed 19 March 2014), 46.

9. General Charles C. Krulak, transcript of "The Three Block War: Fighting in Urban Areas," draft remarks for the National Press Club (10 October 1997), 139.

The modular force designed to operate in the Three Block War in megacities will be a combined team with three distinct capabilities – strike, constabulary, and stability – composed of relevant assets from across the Joint, Interagency, Intergovernmental, and Multinational (JIIM) environment.[10] As a tailorable and scalable force, its size and composition will be based on the magnitude and complexity of the challenges within the megacity. Critical to the success will be the application of flexible organizational structures that can rapidly go to the point of the problem and address the situation. In all efforts, the focus of the force will be to enable local and regional partners to manage the current and future challenges in the megacity.

The first "strike" force will be enabled with the capability to isolate and strike threats throughout the operating environment with the application of small, highly mobile teams operating in a decentralized manner. These teams will be able to quickly aggregate and disaggregate, rapidly assess, and solve problems as they occur. To conduct these swarm operations, strike teams, using time sensitive targeting methods, will be enabled with mobility, protection and firepower to sustain the fight in isolated areas.

In the Three Block War, the second "constabulary" force, similar to the French Gendarme or Italian Caribineri – again operating in small teams – will be employed to address security concerns and challenges via working by, with and through the local and regional law enforcement systems. This force will be enabled with its own mobility, force protection, firepower (lethal and non-lethal), intelligence and specialized skill sets to facilitate seamless integration with local and regional law enforcement. They will possess the capability to conduct community policing, investigation, criminal intelligence, incident management, site exploitation, blast analysis, crowd-riot-control, rule of law training and to conduct Foreign Internal Defense. This force will focus efforts on bringing order to the megacity's ungoverned spaces by enabling the host nation partners to create and maintain resilient law and order systems.

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10. While the Brigade Combat Team is the Army's current modular formation of choice, it is beyond the scope of this paper to assess whether the BCT is still the right construct for future operations in megacities.

The third element, a stability force, will address the governance of the megacity and the development, reconstruction and maintenance of durable city management systems. The stability force must be enabled by the full integration of U.S. Government Interagency assets from across the Diplomatic, Informational, Military, Economic, Financial, Intelligence and Law Enforcement (DIMEFIL) spectrum. As a combined team, the force will enable the national, regional and local governments to effectively manage their systems while ultimately addressing the root causes of instability. The team will overlay on the current megacity systems to focus on infrastructure, poverty, corruption and systems of government, both formal and informal. The stability force will include smaller teams, which have the requisite mobility, protection and firepower to rapidly respond to instability, assess the situation and develop solutions. They will then facilitate the integration of additional assets (such as engineers, civil affairs and other specialists) to rapidly enable local and regional longer-term solutions.

To facilitate the application of the Three Block War approach in megacities, the modular force must be enabled with relevant innovations to simultaneously conduct efforts across the range of military operations. The application of Mission Command in the megacity requires the effective synchronization of all systems to provide commanders with situational awareness through a common operating picture (COP). This COP will facilitate incident management, guide situational understanding and visualization of the operating environment in 3-dimensions, provide city management systems visibility, be able to integrate with local and regional networks and effectively amalgamate assets from across the DIMEFIL spectrum. Communications and information flow across the megacity requires the establishment and maintenance of a mesh network that facilitates below and above-ground communications. This mesh network will integrate transmission and retransmission capabilities from mobile manned and unmanned vehicles as well as fixed systems decentralized throughout the megacity.

Intelligence, Surveillance and Reconnaissance (ISR) in the megacity will include systems that will provide resolution of threat networks as well as the street-level environmental conditions across the operating

environment. The ISR system will be capable of full-spectrum collection and analysis across all intelligence functions. The small teams, decentralized throughout the operating environment, will be augmented with remote, unmanned sensing capabilities that facilitate rapid environmental information collection. This information will then be transmitted through the established mesh network for further analysis, synthesis and integration into the COP and will be available to all elements operating across the megacity.

To enable rapid movement and the decentralized operations, these small teams require rapid mobility. This includes the incorporation of manned and unmanned light and medium Vertical Take Off and Landing (VTOL) capability. As ground movement may face significant constraints and obstacles, wheeled vehicle transport must balance protection with mobility.

Ground logistical operations in the megacity will be constrained by constricted lines of communication (LOC). Therefore, logistics must be decentralized to facilitate the extended operations of the small teams across the megacity. The constriction of ground LOCs will drive tailgate resupply operations with light manned or unmanned VTOL assets. Mobility constraints will limit ground casualty evacuation operations and therefore also require the use of VTOL assets.

The megacity will be a petri dish of environmental, biological and radiological hazards, some components of which may be weaponized into "dirty bombs" for future threat operations. The modular force must therefore incorporate expanded CBRNE and WMD-E identification, tracking and neutralization capabilities.

Megacities create significant operational challenges for the Future Force of 2025 and beyond. The degradation (or elimination) of megacity systems afford numerous opportunities for irregular threats to provide "unconventional order" to the ungoverned spaces while at the same time further deteriorating some or all of the local, regional and national governance apparatus. The modular force proposed to operate in the megacity should be tailorable, scalable, operate decentralized and designed to solve problems at all levels – from the street level to the local and regional governments. The goal of this integrated team

approach is to synchronize and apply all relevant assets from across the U.S. Government DIMEFIL spectrum to enable local, regional and national governments to address the root causes of instability, while developing resiliency in the megacity governance system. The enabling concepts proposed for the modular force are only a start point and require further analysis and development, which is beyond the scope of this paper.

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Integration of Unmanned Platforms in the Army of 2025

Colonel David W. Hardy

The Army of 2025 and beyond is visible today. The leaders of that future Army are already within the ranks, the concepts are already being developed, and the technologies are already emerging. The key to developing that future force is fostering the innovation and making changes today that mature in time to maintain a decisive overmatch on the future battlefield.

Unmanned systems are an emerging and rapidly maturing technology that may provide an asymmetric advantage for the joint force and the Army on future battlefields. The Army should increase funding and accelerate research, development, experimentation and fielding of unmanned systems. More importantly, the Army should expand the role of unmanned systems including adjusting organizational structures and developing operational concepts that take advantage of their unique attributes.

Looking at the future of unmanned systems requires a broader perspective than developing the technology and fielding systems. Integrating unmanned systems across the force requires significant organizational change, and managing the organizational transformation will be crucial to successfully integrating unmanned systems across the force. The future security environment, the anticipated role of the Army, the potential benefits of unmanned systems, and the organizational

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and budgetary challenges all play an important role in the fielding of unmanned systems.

Unmanned systems have already proven their value on the battlefield in a diverse set of missions. Many systems in use today did not exist a few years ago, and the Army has barely scratched the surface of their potential. Advances in teaming, multi-platform control, autonomy and other features enable these systems to contribute in new and unique ways. The Army is a long way from fielding formations of autonomous robots, but the Army acknowledges that robots could increase the lethality of future brigade combat teams.[1]

The Army and the Department of Defense (DoD) already recognize the utility of unmanned systems, and published a roadmap to align research efforts and resources over the next two decades with newly published strategic guidance.[2] These strategic documents align organizational efforts to ensure new systems are effective, affordable, and interoperable. They also provide a strategy for training, maintenance, and sustainment efforts. However, these roadmaps are not complete strategies for the employment of the systems within the context of unified land operations, and do not recommend organizational changes needed to integrate them on the battlefield.

The nature of war in the future will remain the same while the character evolves. War will remain a fundamentally human endeavor driven by policy and strategy, but tremendous changes in the international security environment are on the horizon. Potential transitions in the global order, the fragmentation of the nation-state system, the rise of new technologies, and the emergence of cyber-space all point to new methods and locations for conflict. Our technological overmatch will erode in coming decades requiring more effective strategic and operational approaches to protect our interests.

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1. Alexis Madrigal, "The Future of the Army: Less Soldiers, More Robots, More 'Lethality'" *The Atlantic* (January 21, 2014), http://www.theatlantic.com/technology/archive/2014/01/the-future-of-the-army-fewer-soldiers-more-robots-more-lethality/283230/

2. *Unmanned Systems Integrated Roadmap FY2013-2038* (Washington DC: Joint Robotics Project Office, July 2013) http://www.defense.gov/pubs/DOD-USRM-2013.pdf

Strategic landpower will continue to prevent war, shape the strategic environment, and defeat opponents when necessary. The Army of 2025 and beyond will exist to fight and win our nation's wars, protect American interests, and ensure the American way of life. The Army will operate within a joint environment and multi-national context similar to today, and need to be expeditionary in nature. It must be capable of conducting both combined arms maneuver and wide area security in complex terrain against a variety of threats. The Army will need to be capable of operating along the full range of military operations, but defeating near-peer competitors in high-intensity operations will assume greater importance as U.S. dominance deteriorates and other countries emerge that want to change the international order. The Soldier will remain the centerpiece of the Army, but unmanned systems will ensure overmatch on the battlefield.

Unmanned systems currently perform a variety of missions across multiple joint capability areas – battlespace awareness, force application, protection, and logistics – but they will transform the way the Army fights if it incorporates new organizational approaches and concepts to fully integrate these technologies. These systems are not meant to replace Soldiers, but to be teamed with Soldiers to make more versatile, adaptive, and lethal formations with greater operational reach. They often have performance capabilities that exceed what humans can do, and are particularly useful for the "dull, dirty, and dangerous missions."[3] Unmanned systems also enable Soldiers to focus their time, effort, and attention to ensure mission accomplishment.

The greatest potential challenge to expanding the role of unmanned systems will be organization, not technological. Organizational resistance to change can be very powerful, and leaders must develop strategies to specifically shape organizational culture. Strategic leaders must clarify the concepts, convince the organization that the proposed changes are beneficial, and emplace the appropriate policies to embed and reinforce the desired changes.

All organizations must innovate in order to maintain a competitive advantage, and the Army has a long history of innovation during peacetime. The Pentomic division concept that grew out of visions

3. Department of Defense, *Unmanned Ground Systems Roadmap FY2013-2038*, 25

of fighting on the nuclear battlefield, the digital Army of the 1990s, and the Future Combat System (FCS) initiative are all examples of Army attempts to anticipate future battlefield requirements. The transformation to the digital division in the 1990s showed that the Army successfully cut force structure to fund new technology upgrades that ultimately yielded a much more capable force. More importantly, these changes were done in a time of force downsizing and budget cuts that are comparable to today's fiscal constraints.

Three factors explain organizational resistance to change.[4] First, the idea must conform to the organization's view of an ideal combatant and be acceptable in terms of the method of fighting. Unmanned systems are becoming more acceptable as Soldiers use them in training and combat, and Soldiers embrace the use of armed unmanned aerial vehicles in combat. Humans have the moral obligation to be the ultimate arbiter of the use of force and must comply with the Law of Land Warfare, so human-in-the-loop systems will remain a key component of lethal unmanned systems.[5] Second, the innovation must conform to the organization's view of acceptable war and be seen as relevant and important. Organizational innovations such as wing vehicles will have many detractors because it is a significant departure from the historical experience of the Army. The failed FCS transformation experiment of the last decade will influence leader and Soldier perceptions about the utility of this change. Third, the context of the innovation matters. As an example, innovation during peacetime is often more difficult than during war because the organization does not get clear and immediate feedback about whether benefits outweigh costs.[6]

Any attempt at transformation will also require strategic leaders to underwrite the risk involved in fielding a disruptive technology and address the underlying culture of the Army. Organizational culture is very powerful and often difficult to change in large, mature, and

4. Andrew Hill, "The Shock of the New: Theories of Innovation and the Military" (Working Paper, Carlisle Barracks, PA: U.S. Army War College, July 12, 2013), 4.

5. U.S. Department of Defense, Department of Defense Directive 3000.09, *Autonomy of Weapon Systems* (Washington DC: November 21, 2012)

6. Williamson Murray, "Thinking about Revolutions in Military Affairs," *Joint Force Quarterly* (Summer 1997): 73.

successful organizations. One model for changing organizational culture is to use a set of embedding and reinforcing mechanisms to address the underlying values and assumptions of the organization.[7] Leader focus, assignment policies, promotion rates all serve to shape the organizational culture and will need to be tailored to create the desired changes in the force.

Declining defense budgets are a reality, but the Army cannot allow the budget pressures to prevent modernization. The Army leadership must find ways to maintain the required capabilities in the force today while accelerating this modernization program. The DoD integrated roadmap accounts for these challenges, but also shows the current sourcing challenges. Research, development, testing and evaluation funding will decline over the next five years with DoD becoming a smaller proportion of the world unmanned aircraft system market.[8] The Army strategy includes funding for more advanced ground systems such as the robotic wingman in later years.[9]

Three broad approaches can help the Army overcome the budget and organizational challenges associated with unmanned systems. First, develop a plan to overcome organizational resistance to integrating unmanned systems. Any misunderstanding of the purpose or utility of expanding the role of unmanned systems in future conflict will generate organization resistance to implementation. Any failure to embed the new organizational changes within the Army's culture through a series of mutually reinforcing policies, rewards, training and behaviors will also undermine the effort. Any perception that this program is more about defense contractors than Soldiers will eliminate any chance of success.

Second, review the acquisition and design process to ensure adequate levels of funding and limit inefficiencies. The DoD and the Army have implemented many changes in the robotic and unmanned systems acquisition processes in the past two years. The Army unmanned ground system strategy provides a bridging strategy from the rapidly

7. Stephen J. Gerras, Leonard Wong, and Charles D. Allen, "Organizational Culture; Applying a Hybrid Model to the U.S. Army" (Carlisle Barracks, PA: US Army War College, November 2008), 17.

8. Department of Defense, *Unmanned Systems Integrated Roadmap FY 2013-2038*, 4.

9. Ibid., 7.

fielded systems of the overseas contingency operations to more sustainable programs. The Maneuver Center of Excellence now serves as the lead agency for coordinating and synchronizing requirements across the Army. Current funding levels are inadequate. Funding for research, development, test and evaluation of ground systems is 1% of the funding allocated for air systems with no money allocated for operations and maintenance.

Third, focus more on concept development and experimentation. Unmanned systems will be additive and not as effective if they are developed as individual systems. Bold initiatives that develop and test new doctrinal concepts need to be used to maximize capabilities. The Army should develop requirements that make unmanned systems integral to mission success in the future force.

The Army embraced innovation during other times of budget and strategic uncertainty, and this approach to innovation helped make it the most capable army in the world. Unmanned systems are quickly emerging as one of the most promising new technologies, and the Army has a strategic opportunity to re-shape the force and set it on a course to dominate any adversary. The challenges are real, but they can be overcome with smart policies and strong leadership.

Maintaining Strategic Advantage in Cyberspace: U.S. Army Component Roles

Mr. D. Edward Durham

Global information networks, and the technologies that use them, continue to converge, while growing in importance to United States interests. The Department of Defense (DoD) signified the importance of cyberspace in 2010, when it established Cyber Command at Ft. Meade, Maryland.[1] The DoD assigned Cyber Command (CYBERCOM) three missions:

1. Manage cyberspace risk through efforts such as increased training, information assurance, greater situational awareness, and creating secure and resilient network environments

2. Assure integrity and availability by engaging in smart partnerships, building collective self defenses, and maintaining a common operating picture

3. Ensure the development of integrated capabilities by working closely with Combatant Commands, Services, Agencies, and the acquisition community to rapidly deliver and deploy innovative capabilities where they are needed the most[2]

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1. William J. Lynn III, "Defending a New Domain - The Pentagon's Cyberstrategy" (April 10, 2010) http://www.defense.gov/home/features/2010/0410_cybersec/lynn-article1.aspx (accessed March 14, 2014).

2. U.S. Department of Defense, *Department of Defense Strategy for Operating in Cyberspace* (Washington DC: U.S. Department of Defense, July 2011), 5.

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On 1 October 2010, "the U.S. Army redesignated the inactive Headquarters and Headquarters Company, Second U.S. Army, as U.S. Army Cyber Command (ARCYBER)" marking the Army's formal "entry into the operational domain of cyberspace."[3] ARCYBER "plans, coordinates, integrates, synchronizes, directs, and conducts network operations and defense of all Army networks; when directed, conducts cyberspace operations in support of full spectrum operations to ensure U.S./Allied freedom of action in cyberspace, and to deny the same to our adversaries."[4]

As the Army enters the cyberspace domain, how should it divide roles and responsibilities among its three components to most effectively support Joint Force Commanders?[5] This paper attempts to answer that question by examining roles and responsibilities for the Army components in cyberspace using the Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities, and Policy, or DOTMLPF-P framework.

The Army total force is composed of three components: the Active Component, the Reserve Component, and the Army National Guard.[6] Responsibilities of the Secretary of the Army, outlined in Title 10, U.S. Code, are typically summarized as 'man, train, and equip' Army forces "…so as to fulfill the current and future operational requirements of the unified and specified combatant commands."[7] The Secretary is also ordered to maintain "effective cooperation and coordination between the Department of the Army and the other military departments and agencies of the Department of Defense to provide for more effective,

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3. Army Cyber Command, "History," http://www.arcyber.army.mil/history.html (accessed March 10, 2014).

4. Ibid.

5. Much of the research for this paper is taken from a shorter, unpublished paper entitled *U.S. Army Roles in Cyberspace,* (Carlisle Barracks, PA: U.S. Army War College, March 25, 2014), completed by the author for the U.S. Army War College course "Cyberspace and Cyber Operations."

6. Title 10, U.S. Code, Subtitle B, Chapter 307 § 3062 (c)(1). http://armedservices.house.gov/index.cfm/files/serve?File_id=8f86265a-e2dd-482c-a4f6-72b9a0e1b2d9 (accessed March 23, 2014).

7. Title 10, U.S. Code, Subtitle B, Chapter 303 § 3013 (b), (c)(4). http://armedservices.house.gov/index.cfm/files/serve?File_id=8f86265a-e2dd-482c-a4f6-72b9a0e1b2d9 (accessed March 23, 2014).

efficient, and economical administration and to eliminate duplication."[8] The Army is to assist in "preserving the peace and security…of the United States" and is "organized, trained, and equipped primarily for prompt and sustained combat incident to operations on land."[9]

The Active Component, or Regular Army, "is the component of the Army that…[provides] continuous service on active duty in both peace and war."[10]

The Army Reserve performs a "complementary role to the Active component, providing combat support and combat service support functions to enable the Army to ramp up its capabilities to protect combat forces and sustain mobilization."[11] While taking only 5.3 percent of the Army's budget, the Army Reserve provides one-fifth of the Army's organized units and "provides about half of the Army's combat support and a quarter of the Army's mobilization base expansion capability."[12] Much of the Army's combat support and combat service support capabilities reside in the Army Reserve.[13]

The Army National Guard is defined by Title 10, U.S. Code as "that part of the organized militia of the several States and Territories, Puerto Rico, and the District of Columbia, active and inactive, that is a land force."[14]

Doctrine. DoD Directive 5100.01, *Functions of the Department of Defense and Its Major Components*, directs the Army to formulate

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8. Title 10, U.S. Code, Subtitle B, Chapter 303 § 3013 (c)(5). http://armedservices.house.gov/index.cfm/files/serve?File_id=8f86265a-e2dd-482c-a4f6-72b9a0e1b2d9 (accessed March 23, 2014).

9. Title 10, U.S. Code, Subtitle B, Chapter 307 § 3062 (a)(1), (b). http://armedservices.house.gov/index.cfm/files/serve?File_id=8f86265a-e2dd-482c-a4f6-72b9a0e1b2d9 (accessed March 23, 2014).

10. Title 10, U.S. Code, Subtitle B, Chapter 307 § 3075 (a), http://armedservices.house.gov/index.cfm/files/serve?File_id=8f86265a-e2dd-482c-a4f6-72b9a0e1b2d9 (accessed March 23, 2014).

11. The Army Reserve, "The Army Reserve Mission," http://www.usar.army.mil/ourstory/Pages/default.aspx (accessed March 23, 2014).

12. Ibid.

13. Ibid.

14. Title 10, U.S. Code, Subtitle A, Chapter 301 § 101 (c)(2). http://www.law.cornell.edu/uscode/text/10/101 (accessed March 23, 2014).

doctrine, tactics, techniques, and procedures for employment, as well as to participate in the formulation of joint doctrine.[15] Since cyberspace doctrine continues to be formulated by the joint community, DoD, and the interagency, the Active Component should continue to lead Army participation in the development of joint and service doctrine.[16]

Organization. The Army is in the process of consolidating ARCYBER forces at Ft. Gordon, Georgia, with a liaison element to CYBERCOM located at Ft. Meade.[17] The Cyber Center of Excellence at Fort Gordon is expected to "unify training and modernization efforts for cyberspace operations, electronic warfare, cyber electromagnetic activity and cyber-related signals intelligence."[18] As the Army continues to optimize its force structure addressing the cyber domain, including support to geographic and functional combatant commanders, the Active Component, with participation from the Reserve Component and Army National Guard, should be responsible to develop the Army's cyber organizational structure.[19]

15. U.S. Department of Defense, *Functions of the Department of Defense and Its Major Components*, Department of Defense Directive 5100.01, (Washington, D.C.: U.S. Department of Defense, December 21, 2010), 27-28.

16. Keith B. Alexander, "Statement of General Keith B. Alexander, Commander, Cyber Command, Before the Senate Committee on Armed Services" (12 March 2013), http://www.defense.gov/home/features/2013/0713_cyberdomain/docs/Alexander%20testimony%20March%202013.pdf (accessed March 23, 2014), 4-5..

17. U.S. Department of the Army, *Army Announces Decision on Army Cyber Forces*, Department of the Army Press Release NR-084-13 (Washington DC: U.S. Department of the Army, December 19, 2013). http://www.defense.gov/releases/release.aspx?releaseid=16440 (accessed March 10, 2014).

18. Joe Gould, "New center, school to bring signals, cyber, EW together," *Army Times Online* (June 25, 2013) http://www.armytimes.com/article/20130625/CAREERS/306250002/New-center-school-bring-signals-cyber-EW-together (accessed March 10, 2014).

19. Donald Bray, "Planning Considerations for Offensive Cyber Operations," briefing (U.S. Army War College, Carlisle Barracks, PA, March 11, 2014), cited by permission; Kevin McCaney, "Got a cyber emergency? Call out the National Guard," *Defense Systems Online* (January 30, 2014) http://defensesystems.com/articles/2014/01/30/national-guard-cyber-response.aspx (accessed March 23, 2014); Mickey McCarter, "Senators Seek National Guard Cybersecurity Civil Support Teams," *Homeland Security Today Online* (March 27, 2013) http://www.hstoday.us/briefings/industry-news/single-article/senators-seek-national-guard-cybersecurity-civil-support-teams/8461dd77befa9b1506273a976c5c2b15.html (accessed March 23, 2014).

Training. The primary goal of Army cyber training is to increase the Army's ability to conduct integrated land and cyber unified operations.[20] The Army, as it does in other capability areas, trains on cyber objectives for individual self-development, operational application, and institutional implementation across all three components. At the individual level, the Army requires all personnel to successfully answer cyber security awareness questions prior to logging into Army networks, and requires annual Cyber Awareness Challenge refresher training.[21] Unit training develops operational expertise in the application of cyber to Indications and Warning, Operational Preparation of the Environment, Critical Infrastructure Protection, and Theater Security Cooperation.[22] The Active Component 1st Information Operations Command presents an opposing force to increase understanding of adversary capabilities and operations during combined arms maneuver exercises at the Combat Training Centers.[23] All Army components can incorporate tasks identified by ARCYBER into unit training and exercises, in order to integrate cyberspace operations into Army planning and targeting processes.[24] Institutionally, the Army is training new professional specialties in cyber operations, and incorporating cyber security training into existing courses at all levels.[25] However, the Army participates in only a few military exercises focusing on cyber operations (the annual joint exercises Cyber Flag and Cyber Guard, and the annual military academy Cyber Defense Exercise).[26] The Army's Training and

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20. U.S. Army Cyber Command, "Incorporating Cyber Into Training & Exercises," presentation (AFCEA TechNet Land Forces East 2012, Baltimore, MD, 16 August 2012) http://www.afcea.org/events/tnlf/east12/documents/8IncorporatingCyberintoArmyTrainingandExercisesFinalPR.pdf (accessed March 10, 2014).

21. U.S. Army Signal Center, "DoD Cyber Awareness Challenge Training," https://ia.signal.army.mil/DoDIAA/ (accessed March 10, 2014).

22. U.S. Army Cyber Command, "Incorporating Cyber Into Training & Exercises."

23. Ibid.

24. Ibid.

25. Ibid.

26. U.S. Department of Defense, "Cyber Flag Exercise Highlights Teamwork, Training" (November 19, 2013) http://www.defense.gov/news/newsarticle.aspx?id=121179 (accessed March 23, 2104); U.S. Department of the Army, "Cyber Guard exercise focuses on defensive cyberspace operations" (August 16, 2012) http://www.army.mil/article/85786/ (accessed March 23, 2014); John P. Mello, Jr.,

Doctrine Command, located at Ft. Eustis, Virginia, is responsible to "develop, educate and train Soldiers, civilians, and leaders; support unit training; and design, build and integrate a versatile mix of capabilities, formations, and equipment" for the Army total force.[27]

Materiel. The Army is not the Combatant Command Support Agent for U.S. Cyber Command (the Secretary of the Air Force is), but the Active Component provides infrastructure support to the National Security Agency, the Defense Media Activity, the Defense Information Systems Agency, the Defense Courier Service, and the U.S. Cyber Command, as tenants of Ft. Meade.[28] The Active Component works with Geographic and Functional Combatant Commanders to develop materiel solutions to existing or expected capability gaps through current Army acquisition processes and the Joint Capabilities Integration and Development System (JCIDS).[29] The Active Component's Research, Development, and Engineering Command (RDECOM), Army Research Laboratories (ARL), Aviation and Missile Research, Development, and Engineering Center (AMRDEC), and Communications-Electronics Research, Development, and Engineering Center (CERDEC), work with ARCYBER and partners in industry and academia to conduct basic research on future technologies applicable to the Army in cyberspace.[30]

Leadership and Education. The Army is "recruiting, training, and retaining highly skilled people" to "build teams that are trained, certified, equipped, and prepared to operate decisively throughout

"Military academies take on NSA in cybersecurity competition," *CSO Online* (April 16, 2013) http://www.csoonline.com/article/731796/military-academies-take-on-nsa-in-cybersecurity-competition (accessed March 23, 2014).

27. U.S. Army Training and Doctrine Command, "Command Overview," http://www.tradoc.army.mil/FrontPageContent/Docs/TRADOC%20COMMAND%20BRIEF.pdf (accessed March 23, 2014).

28. U.S. Department of Defense, *Support of the Headquarters of Combatant and Subordinate Unified Commands*, Department of Defense Directive 5100.03, (Washington DC: U.S. Department of Defense, February 9, 2011), 2,5,7; U.S. Department of the Army, "About Fort Meade," http://www.ftmeade.army.mil/pages/about/about2.html (accessed March 13, 2014).

29. U.S. Joint Chiefs of Staff, J*oint Capabilities Integration and Development System*, Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3170.01H, (Washington, D.C.: U.S. Joint Chiefs of Staff, 10 January 2012), 2.

30. David McNally, "Cyber Research," *Army Technology* 1, iss. 2 (October 2013), 7-8.

cyberspace."[31] Because information networks have become ubiquitous across Army organizations and weapons platforms, it is critical that all Army personnel "expand our understanding of cyber threats, vulnerabilities, and capabilities and then focus on actions [to mitigate network risk]."[32] As with every weapons system and training environment, Army leaders in all three components must adopt "leader development and education programs to further enhance operating safely in the cyberspace domain."[33]

Personnel. The Army is expected to grow nearly one-third of the Department of Defense's cyber teams, in addition to several supporting specialties.[34] Cyberspace-specific organizations are still under development and will be modified over the next several years as they are adapted and refined in response to operational lessons learned. Retaining adequately trained and qualified personnel in cyber professions will require the comprehensive cooperation of all three components.

Facilities. The Army is responsible to construct and maintain facilities and infrastructure for joint cyber support teams supporting combatant commands for which the Army is the Combatant Command Support Agent (U.S. European Command, U.S. Africa Command, U.S. Forces Korea, U.S. Southern Command, the special operations forces associated with each of these, and the Joint Special Operations Command).[35] In addition, while not the Combatant Command Support Agent for U.S. Cyber Command, the Army provides facilities support to the National Security Agency, U.S. Cyber Command, and other joint tenants of Ft. Meade.[36] Establishing ARCYBER forces at Fort Gordon, Georgia, is expected to result in considerable cost savings due to use of existing

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31. Edward C. Cardon, "Moving to the Future," *Army Technology* 1, iss. 2 (October 2013), 4.
32. Ibid., 5.
33. Ibid.
34. Sydney J. Freedberg, Jr., The Army's Plan For Cyber, One Bright Spot In Its Budget," *Breaking Defense Online*, February 27, 2014. http://breakingdefense.com/2014/02/the-armys-plan-for-cyber-one-bright-spot-in-its-budget/ (accessed March 10, 2014).
35. U.S. Department of Defense, *Support of the Headquarters of Combatant and Subordinate Unified Commands*, 3.
36. Ibid., 2,5,7; U.S. Department of the Army, "About Fort Meade"

facilities and infrastructure.[37] Facilities support for cyberspace operations is primarily provided by the Army's Active Component.

Policy. The *National Defense Authorization Act for 2012* authorized the DoD to develop a capability for offensive cyber warfare.[38] DoD Directive 5100.01, *Functions of the Department of Defense and Its Major Components*, directs the Army, along with the other Military Departments, to participate in formulating policies and programs aligned with national security objectives.[39] The Army develops policy through both the Secretary of the Army (Active and Reserve Components) and the Chief, National Guard Bureau. The Army appears to have overlooked tremendous capability to influence cyber policy, legislation, and associated funding in Congress offered by the Army Reserve and Army National Guard.[40] In addition, the Army, despite its responsibility for land operations within the Department of Defense, has not effectively linked cyberspace operations with the land domain, though nearly all cyberspace actors and infrastructure reside in the land domain.[41]

Recommendations

1. (Doctrine) Develop and publish doctrine that clearly articulates the role of cyber forces in support of unified land operations. Landpower is used to compel behavioral changes in those acting contrary to United States national interests. It compels these changes in humans, whether in populations or their leadership. "Man can actually change [cyberspace],

37. U.S. Department of the Army, *Army Announces Decision on Army Cyber Forces*.

38. The National Security Authorization Act of 2012, Public Law 112-81, section 954 (112th Congress, December 31, 2011) http://www.gpo.gov/fdsys/pkg/PLAW-112publ81/pdf/PLAW-112publ81.pdf (accessed March 23, 2014).

39. U.S. Department of Defense, *Functions of the Department of Defense and Its Major Components*, 26.

40. Colonel Manley James, "The Role of the National Guard in Cyberspace," briefing (U.S. Army War College, Carlisle Barracks, PA, March 18, 2014), cited by permission; Colonel Alex Wells, "Army Reserve Cyber Forces," briefing (U.S. Army War College, Carlisle Barracks, PA, March 18, 2014), cited by permission.

41. Sydney J. Freedberg, Jr., "People, Cyber, and Dirt: Army and SOCOM's 'Strategic Landpower'," *Breaking Defense Online* (October 24, 2013) http://breakingdefense.com/2013/10/people-cyber-dirt-army-socoms-strategic-landpower/ (accessed March 23, 2014).

and anything that happens there actually creates a change in someone's physical space."[42] Despite the fact that nearly all cyberspace infrastructure and actors are land-based, current doctrine does not clearly link unified land operations and cyberspace operations, nor show where there are synergies or gaps in current concepts and capabilities. Reinforce new doctrine by integrating combined land-cyberspace operations into unit training at the Combat Training Centers.

2. (Organization) Form Reserve Component or Army National Guard units with specific geographic expertise in cyber operations (both defensive and offensive) to develop long-term, focused cultural awareness not typical in the Active Component, such as that developed through the State Partnership Program. These units could also role-play as opposing force units to improve training effectiveness across the total force. These units must by organized and located strategically, with effective recruiting in target critical infrastructure and key resource industries, to provide optimal capability and access during a national cyber contingency. Recruiting must target rare skill sets where they are regionally clustered inside the United States (i.e., recruiting for protection of critical finance infrastructure in South Carolina or energy infrastructure in Oklahoma).[43]

3. (Organization) Establish multi-component cyber teams as regionally aligned forces for each Combatant Command. Active Component forces assigned to each Geographic and Functional Combatant Command form the core capability for these teams. Tailorable Reserve Component and Army National Guard support should be available as phased augmentation forces with specific regional or technical expertise. Forces assigned to the functional combatant commands should be considered part of national mission forces.

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42. Michael V. Hayden, "The Future of Things "Cyber," *Strategic Studies Quarterly*, (Spring 2011)http://www.au.af.mil/au/ssq/2011/spring/hayden.pdf (accessed March 23, 2014), 4.

43. Kevin McCaney, "Got a cyber emergency? Call out the National Guard," *Defense Systems Online* (January 30, 2014) http://defensesystems.com/articles/2014/01/30/national-guard-cyber-response.aspx (accessed March 23, 2014); U.S. Department of Homeland Security, "CIKR," http://www.dhs.gov/blog/2009/11/19/cikr (accessed March 23, 2014).

4. (Organization) Rapidly expand (and perhaps encourage continual innovation and strong leadership in) the Army's cyber force by laterally transferring soldiers, non-commissioned officers, and officers from Space Operations, Electronic Warfare, and some maneuver force Military Occupational Specialties to cyber organizations.[44] Because cyber tactics, techniques, and procedures largely follow those of joint target de-confliction and prioritization in these specialties, such soldiers may demonstrate particular aptitude for moving successfully into cyber professions.[45]

5. (Organization) Leverage the opportunities provided by capability development for the cyber domain to try new resourcing and acquisition models and methods. Success in cyberspace will demand flexibility, adaptability, and resourcefulness atypical of Army bureaucracy. Lessons learned can be implemented across the Army as information technologies converge with other capabilities, enabling Army leaders to drive change toward a leaner, more efficient, and more lethal Army total force.

6. (Organization) Leverage the Army's influence over the Defense Industrial Base and other defense contractors through the Army's acquisition processes to advocate for and enforce higher standards of information and network security. Standards for information and network security developed by the National Institute for Standards and Technology should be required in all Army contracts to ensure public funds are not wasted developing technology our adversaries can easily steal.

7. (Training) Increase the number of exercises focused on Army missions in cyberspace, especially with respect to Defense Support to Civil Authorities and Homeland Defense. In addition, advocate with Geographic and Functional Combatant Commanders to include Army cyberspace operations in existing exercises.

8. (Policy) Leverage the Army's total force to more effectively engage key stakeholders. Army Reserve and Army National Guard leadership have particularly important roles to play in policy development with

44. Jason M. Bender, "The Cyberspace Operations Planner: Challenges to Understanding and Education of Offensive Cyber Operations," *Small Wars Journal Online* (November 5, 2013) http://smallwarsjournal.com/jrnl/art/the-cyberspace-operations-planner (accessed March 23, 2014).

45. Ibid.

respect to educating the legislative and judicial branches of government about Army roles, national security interests, and total force balance. Army leaders at all levels must end their traditional parochialism and bureaucratic maneuvering. Unity of effort is necessary to build a cyber-force capable of defending against the only currently viable existential threat to the future of the United States. Continued Army infighting and lack of vision risks loss of funding and cedes capability development to other military departments, permanently harming the Army's ability to achieve decisive effects on land.

The Army, primarily through the Active Component, but with the support of the Reserve Component and Army National Guard, appears to be effectively integrated with joint organizations on cyberspace Doctrine, Materiel, Leadership and Education, Facilities, and Policy. However, the Army must more effectively link cyberspace and unified land operations through changes to Army Doctrine, Organizations, Training, and Policy to best leverage the cyberspace potential of the total force. Recruiting, training, and retaining skilled cyberspace soldiers will remain a challenge, but can be mitigated by organizational focus and cross-component coordination.

THE
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Chemical, Biological, Radiological, and Nuclear (CBRN) Transformation Strategy

Colonel Chadwick T. Bauld

The United States Army Chemical, Biological, Radiological, and Nuclear (CBRN) School and senior leaders must develop a vision statement for 2025 and beyond. The School and our CBRN leadership must reevaluate the mission areas, the unit formations, the training requirements, and the recruiting and retention strategies to maintain our Corps' relevance and ability to support both the maneuver forces and the new Regionally Aligned Forces (RAF) construct.

In the face of a diminishing force structure and budget, we need: to figure out where we want to be positioned 20 to 30 years in the future; to allocate the appropriate resources; and, to develop the strategy to achieve this end state. Our strategic communication efforts and our ability to understand the way ahead are critical. We cannot effect change to our organizational culture without a successfully implemented campaign plan. Maintaining relevancy demands a three-part approach:

1. We must actively recruit individuals with a propensity for math and science

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2. We must re-align CBRN companies with the Divisions to attain habitual training and contingency relationships

3. We need to reevaluate the Technical Escort roles and responsibilities as a progressive force structure in support of Special Operations Forces (SOF)

1. Active Recruitment

Since the end of the Cold War, the CBRN Corps has shifted focus to developing more technically proficient Soldiers, and rightfully so. The nature of our missions requires immediate decisions and requires us to think quickly. Trying to teach a new recruit who failed or struggled with high school chemistry or biology places a large burden on the CBRN School. The school can develop courses centered on the basics and provide the instruction to ensure that Soldiers pass, but at what cost? Does the time, money or effort really instill confidence in the Soldier or his/her gaining unit? Will the Soldier retain the knowledge? Does the unit provide more advanced training or will the Soldier have to develop it him/herself? A science-oriented Soldier will be able to overcome those obstacles, but must be continually challenged in order to maintain the desire and initiative. The instruction should be more advanced (physical properties, characteristics, protection, mitigation measures, etc.) and challenge the individual's critical and creative thinking skills. The CBRN professional, within a unit or staff, must understand the environment, then the problem, and finally develop an approach to accomplish the objective. Creating the technical expert is much more difficult than teaching a Soldier to become tactically proficient (shoot, move, communicate). The latter can be achieved during unit level training and exercises, but must be repetitive.

Our recruitment and accessions strategy must make the CBRN branch desirable and sought after. The strategy must be one that creates an appetite for continued learning, with more thinking and less following of a checklist. We can't simply pursue what is best for the CBRN branch, but must focus on what is best for the Army and the Nation. If we fail to do the latter, we'll surely receive assistance and/or recommendations from external senior leaders that do not understand the challenges or requirements in a CBRN environment.

2. CBRN Company Realignment to the Division

Our primary mission is to provide CBRN support to the maneuver forces, first and foremost, but we also play a role in Homeland Defense and consequence management. The baseline training requirement should be centered on supporting the Divisions). The Division CBRN Officer must serve as a mentor to company and field grade officers and additionally manage the installation's CBRN assignments. The Division CBRN Sergeants' major (SGM) must do the same for noncommissioned officers and assign new Soldiers to the CBRN Company to gain experience before moving to a maneuver company NBC room or to battalion staff. The Division CBRN Officer/SGM must routinely host professional development sessions for CBRN staff and company personnel and conduct the interviews for prospective Company Commanders and First Sergeants. Competition for the CBRN Company leadership positions used to be extremely competitive within the Division. Most applicants came from the CBRN staff positions within the Division or the installation. The prospective leaders were already familiar with the Division's Standing Operating Procedures (SOPs) and had already established relationships within the Battalion/ Brigade Combat Team (BCT) staff sections. The habitual relationship and integration of the platoon enabled mission specific training and provided opportunities to assess capabilities and limitations while fostering teamwork and trust between the organizations. The platoon participated in the brigade's field training exercises (FTXs), combat training center (CTC) rotations, and deployments.

> *Unit training and leader development are critical to prepare for operations in a complex environment. Accordingly, they are the most important things a unit does. The Army must focus on three strategic ends for training the Total Force: training units to be versatile and ready to support combatant commanders worldwide; developing military and civilian leaders to meet the challenges of the 21st century; and holding commanders responsible for the development and execution of progressive, challenging and realistic training guided by the doctrine of mission command.*[1]

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1. General Raymond T. Odierno and John M. McHugh, Army Strategic Planning Guidance 2013 (Washington, DC: U.S. Department of the Army, 2013), 7.

Some CBRN leaders will argue that their units are better resourced, trained, and more technically proficient in this current non-aligned construct, and that may be true. However, it is equally true that these units lack tactical proficiency (how to shoot, move, and communicate) and we remain unclear on how to support the maneuver forces.

The current CBRN Maneuver Support Company structure is not suitable for distributable platoon level direct support to the BCT, but appears to be more of a general support role to a division with three different platoon formations. The platoon aligned to the BCT must consist of the subject matter experts (SMEs) and be the BCT commander's primary asset for any CBRN related issue. The platoon must be able to conduct CBRN reconnaissance (mounted or dismounted depending upon the divisional alignment), decontaminate personnel/equipment, and characterize a potential hazardous site, but must also know and understand their limitations. If the site appears to be a state- or non-state actor chem/bio production facility, filling station, or storage area, the platoon must advise the commander to request a CBRNE Response Team (CRT) from the Technical Escort Battalion to conduct exploitation, sampling, analysis, and limited destruction.

3. Technical Escort

Technical Escort (TE) CRTs are trained to conduct CBRN Sensitive Site Exploitation (SSE). CRTs enter contaminated environments, assess the situation, aseptically sample critical aspects from production processes to filled munitions, maintain chain of custody documentation, analyze or escort the samples to a laboratory for further analysis, safely destroy filled munitions, and decon their personnel and equipment.

The CBRN Corps cannot afford to man, train, and equip the current level of authorized CRTs. The existing CRTs are also are underutilized, but the CBRN School's Force Design Update (FDU) proposal to distribute the TE companies throughout the five CBRN battalions is not the answer. This paper has already addressed the re-alignment of CBRN Companies to Divisions, but we have lost focus on TE capabilities and limitations since transitioning to a FORSCOM MTOE unit and removing the civilian SMEs from the organization. Every request for forces or CBRN unit identified in a CONPLAN does not require TE.

Corps/Division CBRN Officers and Combatant Commander's CBRN personnel must identify the required capabilities. We don't need more CRTs, but we do need to provide CBRN capability to the Divisions and BCTs. The TE companies are better suited for alignment against Combatant Commander's requirements with the CRTs prepared to support the Theater Special Operations Commands (TSOCs).

Discussion

The personnel, training, AND equipment provide measurable levels of capability. The CBRN Maneuver Support Company and associated platoons must be the Division's and BCT's first point of contact for CBRN issues. They must be capable of site characterization in the tactical or operational environment and must develop a solid relationship with the BCT and associated CBRN staff. Each must understand their roles, responsibilities, and respective unit SOPs. The CBRN Maneuver Support Company should be responsive to the Division just as the CBRN Reconnaissance Detachment (CRD) is responsive to the SF/Ranger community – both for tactical and/or operational environments. Tech Escort should be the theater or strategic asset – the unit that is called upon to exploit a site that potentially leads to prosecution of a state or non-state actor or to a site that requires considerable exploitation in accordance with our national interests.

The discussion and points above strengthen the argument to create a TE assessment and selection program prior to assignment. TE should not be an initial duty assignment and was not one prior to 9/11. An optimal progression should be from the general purpose forces (CBRN Unit, Battalion/BCT staff), to a SF/Ranger CRD, culminating with a five-year assignment to TE. From there, the individuals could become instructors at the TE course, could re-enter the cycle, or could be assigned to Corps and higher level staff positions. The progression to other assignments will improve overall proficiency across our Corps, but the responsibility for CBRN doctrine and training should remain firmly with the CBRN School to ensure the message, priorities, and training are consistent. With the branches and Services divesting oversight for CBRN and WMD, we must ensure we assign strong-willed individuals to the Corps and higher level planning staffs. No

one else will assume responsibility for CBRN or WMD oversight, so we must actively participate in CONPLAN development and educate our Army and Service counterparts.

Conclusion

The United States Army CBRN School and senior leaders must develop a vision statement for 2025 and beyond. The School and our CBRN leadership must reevaluate the mission areas, the unit formations, the training requirements, and the recruiting and retention strategies to maintain our Corps' relevance and ability to support both the maneuver forces and the new RAF construct. Maintaining relevancy demands a three-part approach:

1. We must actively recruit individuals with a propensity for math and science

2. We must re-align CBRN companies with the Divisions to attain habitual training and contingency relationships

3. We need to reevaluate the Technical Escort roles and responsibilities as a progressive force structure in support of Special Operations Forces (SOF)

The alignment strategy streamlines habitual relationships and the opportunity to build teamwork/trust between CBRN forces and their supported organizations. The alignment will require periodic adjustment consistent with future Army transformation efforts and provides flexibility for our forces. Keeping the CBRN units separate and attempting to make them equal will make it difficult to challenge future force reduction efforts. Additionally, we will still struggle with relationship and trust issues. If we do not align with the Divisions and continue to argue that we can surge units to support deployment requirements, then a case could be made to place more force structure within the Reserve Component. We can surge units, but we cannot surge trust. If we are aligned and the Army reduces future forces structure, then we would only lose the associated enablers (i.e. cut a Division, we lose a maneuver support company; cut a BCT, we lose a CBRN platoon). Remaining unaligned, we have the potential to lose more.

Align CBRN Maneuver Support Companies with the Divisions. The alignment will afford opportunities to foster relationships and teamwork during the BCT's FTXs or CTC rotations. We must identify the support requirements for the Army Contingency Force and immediately align platoons to these maneuver BCTs.

Maintain CRD assignment to Special Forces and Ranger units. Align Tech Escort to USASOC, focused on supporting the Combatant Commands. Habitual training will identify capability gaps during associated CONPLAN exercises and additionally will foster relationships, teamwork and mutual understanding.

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Shaping the Debate on Compensation Reform to Man the Army for the Future

Lieutenant Colonel Thomas C. Hawn

The Army's 2013 Strategic Planning Guidance (2013 ASPG) describes an Army in transition, a force preparing for a complex future while supporting the current fight and downsizing. Fiscal constraints make the task of preparing for an uncertain future more challenging. These constraints are particularly difficult for the Army because of the rising costs of compensation. The Army is a human-centric organization and personnel costs, which have more than doubled since 2001, affect it acutely.[1] The Army Chief of Staff has indicated that the Army "will not reduce pay, but reductions must occur in the rate of growth in military compensation and other personnel related costs and benefits."[2] Thus, it is in the Army's interest to shape the national debate on military compensation reform to address future Army requirements.

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1. Lawrence J. Korb, Alex Rothman, and Max Hoffman, "Reforming Military Compensation: Addressing Runaway Personnel Costs is a National Imperative" (May 7, 2012), 1, http://www.americanprogress.org/wp-content/uploads/issues/2012/05/pdf/military_compensation.pdf (accessed March 19, 2014)

2. General Raymond Odierno, "CSA Remarks on the budget impact to the Army briefing at the Pentagon," briefing at the Pentagon (Washington, DC, January 27, 2012), http://www.army.mil/article/72688/Jan__27__2012___CSA_remarks_on_budget_impact_to_Army_briefing_at_Pentagon/ (accessed March 19, 2014)

Lieutenant Colonel Hawn is a Field Artillery officer who has served as a Special Assistant to the TRADOC CG. His next assignment will be as a Strategic Planner in the Executive Strategy Group under the Office of the Director of the Army Staff. His Strategy Research Paper (SRP) examines concepts for deterring violent non-state actors in the future operational environment.

This paper examines compensation reform alternatives to identify solution sets that best support the Army's imperatives as defined by the 2013 ASPG.[3] This examination concludes that the Army should propose concurrent reform of compensation and officer management practices as codified in the Defense Officer Personnel Management Act (DOPMA) of 1980 and supporting Department of Defense (DoD) directives and instructions. This concurrent reformation should extend time-in-service requirements and transition the military to a competency-based promotion model with longer times in grade. Reforms such as these expand the depth and breadth of officers' experiences, and potentially increases the cultural acuity of regionally aligned forces by lengthening a Soldier's time in an assignment.

This examination begins with a review of the current retirement system, DOPMA and officer management system. The analysis then recommends compensation reforms that best support the Army's strategic planning guidance. These recommended changes are insufficient for implementation. Additional modeling and analysis are required; however, the recommendations add to the debate and frame the discussion from the perspective of the Army's strategic imperatives.

The Current Retirement System

The military retirement system originated in the early 1900s when the Army had a small standing cadre of officers and non-commissioned officers to manage expansion in time of conflict. The average life expectancy was 51 years of age. Now, the nation relies on a standing, all-volunteer force and life expectancy has increased 27 years to 78 years of age. A system designed for a relatively small group of individuals that lived an average of 9-13 years past retirement now supports 2.2

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3. Four imperatives form the basis of the Army Campaign Plan: provide modernized and ready, tailored land force capabilities to meet combatant commanders' requirements across the range of military operations; develop leaders to meet the challenges of the 21st century; adapt the Army to more effectively provide land power; and enhance the all-volunteer Army. John M. McHugh and Raymond T. Odierno, *Army Strategic Planning Guidance 2013* (Washington, DC: U.S. Army, 2013), 8, http://usarmy.vo.llnwd.net/e2/rv5_downloads/info/references/army_strategic_planning_guidance.pdf (accessed March 4, 2014).

million retirees living 36-40 years after leaving the service.[4] This has significant cost implications. Personnel costs now account for a third of the base budget (half if civilians are included) and will account for the entire defense budget by 2039.[5]

The current retirement system has advantages. It moves people up and out, retaining a relatively young population. The generous compensation recognizes the sacrifices and risks made by Soldiers and families. The retirement system also provides predictable, time-proven separation rates, and it effectively retains mid and senior-level leaders that must be grown and developed over years.[6]

The military retirement system also has disadvantages. It fails to align with millennial generation mentalities that prefer front-loaded and transportable benefits. In its 2004 "Workplace report on Retirement Planning," CIGNA Retirement and Investment Services highlighted that the top concern of more than half of millennials surveyed was meeting everyday expenses or saving for a new house and car. Nearly half (49 percent) of the millennials surveyed indicated that they were "living for today" when asked to describe their retirement planning state of mind. The millennial state of mind contrasts sharply with the Baby Boomer generation, which highlighted saving for retirement as a top financial concern.[7] Deferred retirement benefits are cost ineffective

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4. Jon P. Sunderland, "The Case for Military Pension Reform." *Joint Force Quarterly* 68 (1st Quarter, 2013): 44, http://search.proquest.com/docview/1429670 517?accountid=4444, (accessed March 19, 2014).

5. Korb, Rothman, and Hoffmant, "Reforming Military Compensation," 1.

6. Todd D. Hirneisen, *New Generation of Military Members Provides Opportunity to Reform Military Benefits*, Strategy Research Project (Carlisle Barracks, PA: U.S. Army War College, March 2013), 10, http://www.dtic.mil/dtic/tr/fulltext/u2/9589334.pdf (accessed March 19, 2014); George H. Quester, "Demographic Trends and Military Recruitment: Surprising Possibilities" *Parameters* 35, no. 1 (Spring 2005): 28, http://search.proquest.com/docview/198044991?accountid=4444 (accessed March 19, 2014); Roy A. Wallace, David S. Lyle and John Z. Smith, *A Framework for Restructuring the Military Retirement System* (Carlisle Barracks, PA: Strategic Studies Institute and U.S. Army War College Press, July 2013), 2, http://www.strategicstudiesinstitute.army.mil/pubs/download.cfm?q=1162 (accessed March 21, 2014).

7. "Benefits of 401(k) Plans May Be Lost on New 'Millennial' Generation; CIGNA Survey Finds 401(k)s Fail to Engage America's Youngest Workers," *PR Newswire* (March 2, 2004), http://www.prnewswire.com/news-releases/benefits-of-

toward the millennial mindset. The deferred payment is worth less to the service member today than it costs the service in the future.[8] Front-loaded benefits such as education assistance, pay, health care and services are more cost effective to the government and more enticing to millennials.[9]

The 20-year vesting period has additional disadvantages. The system rewards all personnel equally and may create a reluctance to separate under-performing mid-level leaders because of the lack of a separation benefit. Only 17 percent of actual service members ever earn the benefit.[10] Of those that remain until non-disability retirement, 75 percent retire with 23 years or less of service, resulting in a loss of mid to senior-level talent.[11] Finally, the 20-year vesting period induces a common career length, into which the service compresses all desired assignments. In order to provide officers with mandated and desired job experiences, such as joint and command billets, the services have shortened assignment lengths, sacrificing depth of experience for breadth. Shorter assignment lengths incur a cost on families by imposing frequent moves. These truncated assignments also create perverse incentives by focusing on short-term goals rather than long-term success.[12]

401k-plans-may-be-lost-on-new-millennial-generation-cigna-survey-finds-401ks-fail-to-engage-americas-youngest-workers-58740182.html (accessed May 15, 2014).

8. Wallace, Lyle and Smith, *A Framework for Restructuring*, 6; Matthew T. Smith, *Military Retirement: Reform for the 21st Century Force*, Strategy Research Project (Carlisle Barracks, PA: U.S. Army War College, March 24, 2011), 14, http://handle.dtic.mil/100.2/ADA560224 (accessed March 19, 2014).

9. Beth J Asch, James Hosek, Michael Mattock and Christina Panis, *Assessing Compensation Reform: Research in support of the 10th Quadrennial Review of Military Compensation* (RAND Corporation, Arlington, VA, 2008), 9.

10. Smith, *Military Retirement*, 3.

11. "Paying for the All-Voluntary Military: A Policy Board Study Finds That the U.S. cannot Sustain the Cost of the All-Voluntary Service without Reform," *The Washington Post* (January 15, 2013), http://search.proquest.com/dociew/1269456965?accountid=4444 (accessed March 19, 2014).

12. Smith, *Military Retirement*, 10; Thomas C. Fisher, *Judging Retirement Reform Using the Strategic Thinking Framework*, Strategy Research Project (Carlisle Barracks, PA: U.S. Army War College, March 22, 2012), 6, http://handle.dtic.mil/100.2/ADA561674 (accessed March 19, 2014); Asch, et al., *Assessing Compensation Reform*, 10.

Defense Officer Personnel Management Act of 1980

The Army's officer management system codifies the career compression induced by the 20-year retirement model. DOPMA and supporting DoD directives and instructions define the system and formalize assignment and promotion eligibility requirements. The officer management system dates back to the Secretary of Defense's Report to Congress on Officer Grade Limitation in 1973. This report became the foundation for laws and policies that fix total time in grade and time in career, thus implementing a time-based promotion model. The system also specifies assignment and time in grade requirements for promotion eligibility, which then shapes assignment lengths. All mandatory training, professional military education and assignments to develop expertise in an officer's specialty must occur within timelines developed around a 20-year career pattern. As policymakers and the services impose more assignments within a fixed time in service, such as with the passage of the Goldwater-Nichols Act, assignment lengths shorten and the opportunity for broadening assignments outside a specific career field reduce. These shorter assignments limit the depth of an officer's experience and impose frequent moves on officers and their families.[13]

A 2006 RAND study examined alternative officer management scenarios, adjusting assignment and career lengths and time to promotion. This examination indicated that extending time in service, position tenure and promotion timing resulted in officers with a similar breadth of experience as they have today, but with greater depth of experience. Extending time in service and promotion timing, but retaining the current length of position tenure sustained current depth of experience but added additional breadth.[14] In both cases, extending time in service created an opportunity for a more experienced officer corps.

The above officer management variants are still time-based models in that officers become eligible for promotion at a specific time in grade. An additional alternative is to switch to a competency-based model in which officers become eligible for promotion after meeting specific

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13. Peter Schirmer, Harry J. Thie, Margaret C. Harrell and Michael S. Tseng, *Challenging Time in DOPMA: Flexible and Contemporary Military Officer Management* (RAND Corporation, Arlington VA, 2006), 10-14.

14. Ibid., 22-28.

experience requirements. These requirements may include some combination of schooling and assignments. The same study referenced above indicated that competency models, which incorporated longer time in service increased the variance of time to promotion, but allowed for longer job tenure. Further, the competency-based system resulted in more officers in the grade of O-6 with diverse job experiences than the time-based model.[15]

Change Proposals

The fiscal constraints that force a change on the military retirement system potentially create an opportunity to change the 20-year retirement paradigm. Extending time in service may allow for a reformation of the officer management system to create leaders with greater depth and breadth of experience.

Seven different panels examined the military retirement system since 1976. These panels generally focused on how the services and congress could offer a fair benefits package at a reasonable cost while sustaining personnel inventory.[16] In contrast to these prior studies, this examination focuses on changing the retirement and management systems to support the Army imperatives defined in the 2013 ASPG while reducing cost. Two specific imperatives shape this examination: provide modernized and ready, tailored land force capabilities; and develop leaders to meet the challenges of the 21st century. Within these imperatives, this analysis focuses on six supporting actions (three from each imperative). These six actions are: train for operational adaptability; regionally align forces; institute Army total force policy; train, educate and provide leaders with experience; enhance broadening opportunities; and develop courses of action to deal with long-term demographic trends in the United States.[17]

Lengthen Terms of Service through Changes to the Defined Benefit Plan

To address the overall cost consideration, this examination only considered cost-saving measures already proposed by previous

15. Ibid., 33-35 and 45-46.
16. Smith, *Military Retirement*, 3-4.
17. McHugh and Odierno, *Army Strategic Planning*, 8-14.

retirement studies that demonstrated through modeling the ability to reduce cost while sustaining current recruitment and retention goals. From this menu of change proposals, this analysis first identified alternatives that eliminated or extended the retirement vesting period. Extending time in service commensurate with time in grade promotion requirements allows for increased position tenure and a wider number of broadening assignments. Lengthened time in position, particularly at the company-grade level improves operational adaptability and regional alignment efficacy by providing leaders more time to gain greater cultural understanding and pursue language proficiency. Lengthened time in service supports leader development by allowing more opportunities for broadening assignments and increase the depth of experience within operational assignments.

Retirement proposals that lengthen time in service include those that extend full vesting to the 25 or 30-year point or those that delay payout of the defined benefit until a set age. One novel proposal establishes a defined benefit after 20 years of service that begins payouts when the service member's age plus time in service equals 80 years. For instance, an 18-year old would be eligible for retirement payouts after 31 years of service at the age of 49 (31+49=80); a 22-year old would be eligible after 29 years of service (29+51=80). A service member that only served 20 years would begin receiving payouts at age 60.[18] All of these alternatives reduce costs and create space for modifying the officer management system by incentivizing longer service times. The best alternative is dependent upon officer management system reforms, but these alternatives narrow the scope for future analysis.

Extending time in service combined with lengthening of the officer management system as described above would potentially provide leaders with greater breadth and depth of experience. This combination also addresses future demographic challenges. Projections indicate that only 15% of Americans, aged 17-24 will be eligible for military service.[19] Additionally, the population will be older.[20] Extending the length of service acknowledges the continued service potential of older service members. Further, slowing the "up-and-out" throughput of the

18. Sunderland, "The Case for Military Pension Reform," 46.
19. Fisher, *Judging Retirement*, 6.
20. Quester, "Demographic Trends," 27.

current system reduces the annual recruiting demand (assuming that compensation retains Soldiers longer).

Add Transportability through an Enhanced Defined Contribution Plan

The Thrift Savings Plan (TSP) serves as a defined contribution plan for the military. The services should retain and enhance the TSP in addition to the adjusted defined benefit plan to better retain mid-grade leaders. Enhancing this plan with an automatic service contribution equivalent to 5 percent of base pay with an additional 5 percent employee match beyond this provides an incentive to retain initial term Soldiers longer. The service member would become 50 percent vested in these contributions at 10 years of service and would gain an additional 10 percent vest for each additional year up to 15. The automatic contribution would counter the milllennial tendency to 'non-participate' in retirement plans. The 10-year vest would incentivize Soldiers to remain at least until their tenth year of service and better retain mid-grade leaders that do not intend to remain until eligible for the defined benefit plan.[21] Better retention to 10 years of service increases productivity and experience of junior leaders.[22]

An enhanced defined contribution plan has additional benefits for demographic changes and total force policy. The plan's portability appeals to the millennial generation who prefer front-loaded benefit systems. Therefore, the Army gets a better return on its compensation investment.[23] Additionally, the plan provides an incentive for service members to transfer to the National Guard or Reserve if not fully vested.[24] Finally, it eliminates the service's reluctance to eliminate under-performing mid-grade leaders at the 15-20 year point by providing compensation for those that reach their full potential before reaching defined benefit plan eligibility.[25]

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21. Wallace, Lyle and Smith, *A Framework for Restructuring*, 11.
22. Asch, et al., *Assessing Compensation Reform*, 78-79.
23. Ibid., 9.
24. Smith, *Military Retirement*, 23.
25. Hirneisen, *New Generation*, 16.

Conclusion

The military retirement system is a tremendous benefit and its modification warrants careful study. As testified by Jo Rooney, Principal Deputy Under Secretary of Defense for Personnel and Readiness, in 2011:

> *These men and women [service members] are a very small portion of our population, and they bear significant burdens on behalf of our nation. They endure substantial physical risks and many have deployed multiple times. They uproot their families frequently in support of our national defense. Our nation places great demands on them and has great expectations of them. Our recognition and remuneration of them should be equally significant and should acknowledge their continued sacrifices.*[26]

While compensation should reflect a service member's sacrifice, a retirement system designed over a century ago for a very different military and population demographic is unsustainable and counter to developing leaders with the skills required for an uncertain future. The fiscal requirement to modify the system provides an opportunity to reform compensation to better support Army imperatives. Reforming the military retirement system is beyond the Army's authority, but as the service most affected by the system, the Army should shape the debate. As stated in the 2013 ASPG, "to the extent authorities, policies, laws and regulations or the lack thereof inhibit an adaptable approach to personnel management, policies should be reformed where authority exists. Where it does not, efforts should be made to appropriately effect change."[27] The ASPG imperatives define the Army's requirements for the future. Compensation reforms that extend overall time in service and improve retention of junior and mid-grade leaders combined with officer management system modifications that lengthen position tenure and time in grade best support these imperatives.

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26. U.S. Congress, House of Representatives, Armed Services Committee, Subcommittee on Military Personnel, *House Armed Services Subcommittee on Military Personnel Hearing* (Lanham: Federal Information & News Dispatch, Inc, 2011) http://search.proquest.com/docview/901216946?accountid=4444 (accessed March 19, 2014).

27. McHugh and Odierno, *Army Strategic Planning*, 17.

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How Should the Army Develop Strategic Leaders for 2025?

Colonel Daniel M. Shrimpton

If you don't know where you are going, any road will get you there.
                                                        —Unknown

How should the Army develop Senior Leaders to meet the challenges of 2025? The Honorable John McHugh, Secretary of the Army, and General Ray Odierno, Chief of Staff of the Army, believe that leader development is critically important to the Army. In the 2013 Army Strategic Planning Guidance, leader development is listed as one of four imperatives.[1] Secretary McHugh and General Odierno specify some broad skills and attributes needed by Army leaders at all levels.

> *The paramount requirement for the Army is to develop leaders from all components who are comfortable making decisions with imperfect information in any situation, including highly complex and dangerous environments. These same leaders must also be*

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1. John McHugh and Raymond Odierno, "Army Strategic Planning Guidance, 2013" http://usarmy.vo.llnwd.net/e2/rv5_downloads/info/references/army_strategic_planning_guidance.pdf, 8.

Colonel Shrimpton will be assigned to the Army Staff as the Manpower and Forces Program Analysis Division Chief within PA&E under the G8. Dan is an Operations Research Systems Analyst (FA49) who has worked on the Army Staff, Army Secretariat, and in the Office of the Secretary of Defense. His SRP topic is on the application of Clausewitz and the Federalist papers to U.S. Cyber operations, understanding the limits of Military Cyber Operations in a Democracy.

capable of training Soldiers to be adaptive, professional and disciplined to execute any mission.[2]

They also see a need to broaden leaders' perspectives. Within leader development the Army needs to include additional experiences through work or education.

Leaders need perspectives not limited to purely Army endeavors. Enhanced broadening experiences will build critical thinking skills and the ability to develop innovative solutions applicable to difficult situations. The Joint, interagency, intergovernmental and multinational environment demands broader mindsets best developed through a variety of experiences.[3]

Through broadening, the Army, is really seeking more intellectually diverse leaders who can creatively solve ambiguous, complex, and complicated problems. An intellectually diverse leadership will allow the Army to gain and retain and maintain a position of relative advantage in decision making. Gaining perspectives that go beyond the Army will enable greater diversity of thought, yielding richer and more creative solutions to problems. Broadened leaders will better connect the Army when developing whole of government solutions. Broadening is the ways, intellectual diversity is the desired end-state – all packaged within a promotion system which creates and encourages healthy competition.

At very basic level, the Army has three options available to build the necessary talent pool. First, the Army can rely on acquiring the talent during the accessions process. Second, the Army can focus on a rigorous training and education system that develops the talent pool. Finally, the Army can use a hybrid approach, a combination of the two. Currently the Army focuses on talent development. In this paper I recommend that the Army move to the hybrid approach by implementing more controls at accession. Additionally, the Army can make improvements to its talent development program.

Currently, the Army accesses officers from three sources: the U.S. Military Academy (USMA), ROTC, and Officer Candidate School

2. Ibid., 13
3. Ibid.

(OCS). All three sources use screening criteria to ensure quality, though each has different quality standards. In general, these quality standards focus on leadership, academic, and physical aptitude. Problem-solving is then taught as a component of each of these programs. The Army could add problem-solving as an evaluation element when selecting cadets for admission to USMA, awarding ROTC scholarships, and selecting Soldiers for admittance to OCS. This would allow the Army to ensure the problem solving foundation of the Officer Corps is strong.

The Army can also look at commissioning sources and academic experience as a method to build a cohort of leaders with a broad range of problem-solving skills. A broader and richer diversity of academic backgrounds builds a better foundation from which to develop problem-solving leaders. Problem-solving is a component of the curriculum at the USMA which gives the Army great control over content. However, this greater control does not yield the greater diversity in approach desired by the Army Secretary and Chief of Staff, because it is fundamentally the Army approach to problem-solving. ROTC and OCS have the potential to provide the diversity because, in general, the academic experience is less Army-centric. The Army should identify those universities and academic majors that produce effective problem-solvers. These programs should be the priority for ROTC or for OCS recruiting. Also, while the Army strategy specifically identifies a need for creative problem-solvers, there is no mechanism to determine if an accession cohort has the right baseline of skills that will allow them to develop into the strategic problem-solvers needed by the Army.

The Army should make changes to the way in which it develops problem-solvers. The Army increasingly discusses talent management – a component of talent development, but alone insufficient to build truly effective problem solvers. Management simply makes the best use of the existing pool of leaders and is a passive approach. The Army needs a more active approach that <u>develops</u> officer problem-solving skills. Development can happen in two places: inside the Army and outside the Army. The Army has always been effective at developing officers inside the Army through a world-class education system, particularly at the Command and General Staff College and the Army War College. These institutions are optimized to develop

the *core* problem-solving abilities of leaders. Outside the Army, leaders are developed through fellowships, joint assignments, advanced civil schooling, and interagency assignments which develop the *broad* problem-solving abilities of leaders. In order to meet the Secretary McHugh and General Odierno's intent of broadened officers, we must maximize the broadening opportunities available to leaders. To frame an approach to developing a broader leadership, three questions should be answered: Who should we broaden?; How should we broaden?; and When do we broaden?

Who should we broaden?

The Army should focus its directed broadening efforts on the Senior Leaders – Colonels and General Officers. The Army must have all senior leaders with the capability and capacity to be broad strategic thinkers. Broadening builds on Army experience. It also takes time and resources. While broadening can be helpful for some officers at lower levels within the Army, it is critical for all our senior leaders. The characteristics of the officer program will drive the Army to incorporate broadening opportunities at various points in an officer's career which will yield a small bench of broadened mid-grade officers. Fiscal pressure will prohibit the Army from providing these broadening opportunities for all officers. Additionally, broadening is best leveraged later in the career which will allow officers to build a strong fundamental understanding of the Army before immersion in experiences outside the Army.

The Army has two principal mechanisms available to broaden officers – education and experience. There is ample graduate school opportunity in the Army. Several hundred advanced civil schooling slots are available every year to provide faculty to USMA as well as within several branches and functional areas. Additionally, the pre-commissioning incentive program provides graduate school opportunity to several hundred additional officers. The graduate school programs are well resourced. The Army is, however, limited in its ability to provide broadening work experience within the Army. The Army could add broadening positions through fellowships or interagency positions, but in a zero-sum game, adding these positions requires the Army to eliminate another. While not impossible, it will be difficult to create a substantial

number of broadening positions. The Army could increase broadening opportunity by exchanging Intermediate Level Education (ILE) seats at Ft. Leavenworth for fellowships similar to the Senior Service College (SSC) Fellowship program. These additional fellows could be partnered with the SSC and post-SSC Fellows to provide mentoring.

Increased broadening opportunity must also be balanced with selectivity. The demand for Majors and Lieutenant Colonels grew dramatically during the 2000's due to modularity and growth in the size of staffs. This growth drove increased promotion rates because of decreased selectivity. As the Army draws down, there is a danger that the reductions will be focused on the junior officer grades. This will limit the Army's ability to maintain competitive promotion rates after the drawdown. Competitive promotion rates require higher ratios of junior grades to senior grades; disproportionate junior grade reductions increase promotion rates. We must carefully balance broadening opportunities and education requirements with promotion selectivity. Currently, selectivity is not a primary consideration when making force structure or officer development decisions. As the Army goes through the Total Army Analysis, broadening opportunity and selectivity must be included in the decision making process.

How should we broaden?

Deciding how to broaden officers should require the Army to articulate a defined end-state. Broadening for the sake of broadening is a waste of time and resources and is not defendable in the current fiscal environment. The Army must determine the skills and abilities that broadening can impart to our officers. The guidance given in the 2013 Army Strategic Planning Guidance is a start. TRADOC should help the Army understand which critical skills and abilities are not able to be developed in the Army – and help develop the broadening program to fill these gaps. This is not to imply that every broadened officer will have the same set of skills. The Army must gain a better understanding of the range of skills and abilities that senior leaders need and build a program that will develop a range of officers with this range of skills – with each officer preferably having a different mix of skills and abilities. The end-state should be an intellectually diverse officer corps.

When should we broaden?

It is too late to affect the senior leaders of 2025. The last three Army Chiefs of staff assumed their positions between 35 and 37 years of service. This has been gradually increasing over the last 30 years. Generals Vuono, Sullivan, and Reimer each became Army Chief of Staff between 30 and 33 years of service. Assuming the current trend of 35-37 years of service continues, 2025's Chief would assume the position at 24 years of service and has most likely already graduated from an SSC. The Colonels who will "pin-on" in 2025 have completed ILE and the Army War College class of 2015 may contain some officers who will have a mandatory retirement date within 2025. Building senior officers requires a long-term view.

The longer long-term view poses a challenge. We know that predicting the future is difficult and this difficulty increases the further into the future we look. The history of our nation is littered with examples where we did not correctly predict the future. An officer development program that depends on correctly predicting the future risks failure. If we cannot predict the future with any degree of certainty, how do we plan to develop senior leaders? We need officers that are adaptable. We know that what we need in our officers today is different than what we will need in 20 years. The Army must ensure that the Officers accessed today are adaptable so that they can be transformed into the officers needed in the future. We can handle the uncertainty if we have flexible officers. The Army should create and resource an environment which produces a body of officers who are exposed to diverse experiences, enabling them to form broadly informed opinions to lead the Army into the future.

Secondary Education Reform and National Security

Colonel Robert G. Picht Jr.

Our men and women in uniform are the best in the world. But the sophistication of our military is increasing every year so we will soon need even better-qualified recruits. Unfortunately, the number of young Americans who have high-school degrees, are in good physical shape, and are without criminal records is declining.[1]

—Henry "Hugh" Shelton, General, U.S. Army (Ret.)
Former Chairman, Joint Chiefs of Staff

For the past 100 years in American history, parents expected that their children would receive a better education than they had achieved. General Shelton's quote implies that for the most part, this is not the case. The United States' secondary education system (grades 6-12) is insufficiently preparing its students to contribute to

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1. "Ready, Willing, and Unable To Serve" (Mission: Readiness.org, 2009) http://cdn.missionreadiness.org/MR-Ready-Willing-Unable.pdf. (accessed March 13, 2014). 2.

Colonel Picht, a Field Artillery officer, previously served as Battalion Commander, 1st Battalion, 14th Field Artillery Regiment (HIMARS), 214th Fires Brigade, Fort Sill, Oklahoma. During his command tenure he deployed with personnel from the Battalion and Brigade as part of Security Force Assistance Teams (SFAT) in support of Operation Enduring Freedom, Kandahar, Afghanistan. His next assignment will be as the TCM-Fires Brigade at Fort Sill. His Strategy Research Paper (SRP) examines the degradation of secondary education (grades 6-12) and its future impact on national security.

U.S. competitiveness in the future security environment. As a result, the erosion of secondary education is becoming a national security issue. This decline, if unchecked, will adversely affect military recruiting and readiness, economic growth and stability as well as intellectual innovation of our young citizens. This paper focuses on the decline in education and examines past and present reform initiatives in the U.S. education system and compares U.S. and global education statistics. It also identifies the current difficulties facing the education system and shows the linkages between the nation's education systems and the impact on national security. It provides recommendations for implementation among the Department of Defense (DoD), federal and state agencies, and the private sector.

Our military readiness, and thus our national security, will depend on the ability of the upcoming generation to serve in our Army of 2030. As Rear Admiral James Barnett reiterates: "Our national security in the year 2030 is absolutely dependent upon what is going on in pre-kindergarten today."[2] A 2012 report, released by a Council on Foreign Relations (CFR)–sponsored Independent Task Force on U.S. Education Reform and National Security (chaired by Joel I. Klein, former head of New York City public schools, and Condoleezza Rice, former Secretary of State), contends that the United States "will not be able to keep pace – much less lead – globally unless it moves to fix the problems (within education) it has allowed to fester for too long."[3] A report issued by Mission: Readiness, a nonpartisan national security organization of over 200 retired senior military leaders advocating education reform, noted that 75 percent of U.S. citizens between the ages of 17 and 24 are not qualified to join the military because they are physically unfit, have criminal records, or have inadequate levels of education.[4] The report further stated that 25 percent of students who drop out of high school are unqualified to serve, as are the approximately 30 percent of high school graduates who do graduate but do not know enough math,

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2. Ibid. 5.

3. Joel I. Klein, Condoleezza Rice and Julia Levy, *U.S. Education Reform and National Security* (Independent Task Force Report No. 68, Council on Foreign Relations, 2012), 58.

4. "Ready, Willing, and Unable To Serve," 2.

science, and English to perform well on the mandatory Armed Services Vocational Aptitude Battery (ASVAB).[5]

The recent results of the 2012 Program for International Student Assessment (PISA), an international assessment that measures the performance of fifteen-year-olds in reading, mathematics, and science every three years, confirm the problems within the U.S. education system. U.S. students ranked 20th in reading, 29th in math, and 22nd in science among students in 62 countries and education systems.[6] On the day the PISA results were released, U.S. Secretary of Education Arne Duncan commented that, "The big picture of U.S. performance on the 2012 PISA is straightforward and stark: It is a picture of educational stagnation."[7]

The fears regarding poor educational performance and its impact on national security are nothing new. In April 1983, then Secretary of Education, T. H. Bell, along with a panel of educators and business leaders, detailed the problems with U.S. education in a report entitled, *A Nation at Risk*, which warned of "a rising tide of mediocrity that threatens our very future as a nation and a people."[8] The report also stated, "If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war. As it stands, we have allowed this to happen to ourselves."[9] The report concluded that declines in educational performance were the result of inadequacies in the way

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5. Ibid, 2. The ASVAB is a nine section test used to determine qualification for enlistment in the United States Armed Forces.

6. OECD, "Comparing Countries and Economies' Performance," figure 1, http://www.pisa.oecd.org/dataoecd/54/12/46643496.pdf. (accessed December 15, 2013).

7. Remarks of U.S. Secretary of Education Arne Duncan, "The Threat of Educational Stagnation and Complacency" (U.S. Department of Education, December 3, 2013) http://www.ed.gov/news/speeches/threat-educational-stagnation-and-complacency

8. The National Commission on Excellence in Education, "A Nation at Risk: The Imperative for Educational Reform" (Washington, DC: Government Printing Office, 1983) http://reagan.procon.org/sourcefiles/a-nation-at-risk-reagan-april-1983.pdf (accessed March 15, 2014).

9. Ibid.

the educational process itself is often conducted as it relates to content, expectations, time, and teaching.

Educational reform efforts increased in the past 20 years spanning four presidential administrations with a common thread among them focused on improving high school graduation rates, refining the quality of teachers, and improving education standards and accountability. While the accomplishments of these efforts highlighted education problem areas and achievement gaps, critics argued that programs were not properly funded and created a 'teaching to the test' method of education.[10] A 2013 report from the Brookings Institution cites education governance's failing due to its fragmented and multipolar decision making by highlighting that every major decision affecting education is shaped (and misshaped) by at least four separate levels of governance: federal, state, the local school district, and the individual school itself.[11] The report also notes the influence of court decisions on schools as well as parental involvement and special interest groups which can further fragment the governance framework.

One hurdle for schools to overcome in molding upstanding citizens is that many U.S. public schools have stopped teaching civics and citizenship classes. This omission leaves students "without knowledge of their own national history, traditions, and values."[12] In civics, about "a quarter of American students are proficient or better on the National Assessment of Educational Progress (NAEP)," meaning a majority of twelfth graders are unable to describe how laws are passed, are unfamiliar with landmark Supreme Court decisions, and are unsure of the functions of the U.S. Constitution or the Bill of Rights.[13]

As U.S. students struggle to understand their own identity and history, another widening gap is unfamiliarity with a foreign language.

10. Deborah White, "Pros & Cons of the No Child Left Behind Act" (About.com U.S. Liberal Politics, 2013) http://usliberals.about.com/od/education/i/NCLBProsCons_2.htm (accessed November 16, 2013).

11. Chester E. Finn Jr. and Michael J. Petrilli, "The Failures of U.S. Education Governance Today," *Education Governance for the Twenty First Century* (The Brookings Institution: Washington DC, 2013), 21.

12. Council on Foreign Relations, "U.S. Education Reform and National Security,"15.

13. Ibid.

Generally, students graduate and do not understand or communicate with their global peers since only eight in ten Americans only speak English, and more schools are no longer teaching foreign languages.[14] This foreign language deficit will limit U.S. citizens' participation and competition in diplomatic or military situations and has a greater impact on government agencies as they try to hire people knowledgeable about other countries or fluent in foreign languages. This deficit in foreign language abilities is already evident in the U.S. Foreign Service. A Government Accountability Office (GAO) report found that the State Department faces foreign language shortfalls in areas of strategic interest. In Afghanistan, the report found, "33 of 45 officers in language-designated positions did not meet the State Department's language requirements. In Iraq, 8 of 14 officers did not have the necessary skills."[15]

As the United States continues to grapple with the best ways to educate its students, educational programs around the world are steadily improving. The countries of Germany, Luxembourg, and Hungary were behind the United States in math on the 2000 PISA exam; however in 2009 each outperformed the United States.[16] Finland attributes their continued excellence on the PISA exams to an education system which relies on the expertise of teachers who are empowered to develop curriculum and student assessment. Additionally, all Finnish teachers in primary, middle and high schools must hold a master's degree and there are no alternative ways to receive teaching credentials in Finland.[17]

Since Singapore gained independence from Malaysia in 1965, the government's view of education as a key foundation to build their

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14. Ibid.

15. *Department of State: Comprehensive Plan Needed to Address Persistent Foreign Language Shortfalls,* Report to the Subcommittee on Oversight of Government Management, the Federal Workforce, and the District of Columbia, Committee on Homeland Security and Governmental Affairs, U.S. Senate, GAO-09-955 (Washington DC: Government Accountability Office, September 2009).

16. "Highlights from PISA 2009," NCES 2011-004 (Washington DC: National Center for Education Statistics, 2010) http://nces.ed.gov/pubs2011/2011004.pdf (accessed November 16, 2013).

17. Pasi Sahlberg, "Lessons from Finland," *The Education Digest* 77.3 (November 2011), (accessed December 15, 2013 via ProQuest).

economy and their nation has allowed them to emerge as an economic and educational leader in the region. In 1997, their educational vision, "Thinking Schools, Learning Nation" succinctly recognized former Prime Minister Goh Chok Tong's belief that "a nation's wealth in the 21st century will depend on the capacity of its people to learn," continued to tailor education to the abilities of its students, but it also introduced changes to the management of schools and its teachers.[18] The government also recognized the need for teachers to keep up with the changing global landscape and placed a premium on teacher development by authorizing up to 100 hours annually for professional development.[19]

Critics of Singapore and Finland's educational successes point to the catchphrase 'size matters' considering their education systems can be compared to the size of U.S. states. Meritocratic values underpin their education system noting that education is the route to advancement and that hard work and effort pay off. This deliberative and adaptive approach transferred into their military transformation as well, especially in Singapore.

Improving education and its reform efforts in the United States are possible, but require a different mindset involving government and societal approaches. The impulse to search for a 'silver bullet' solution must be limited so that the problem is addressed along multiple lines of effort involving federal, state, and local governments, administrators as well as teacher unions and the private sector.

As the DoD and military services face leaner budgets, they must remain committed to programs and partnerships with the Department of Education (DoE), states and municipalities, private businesses, and citizens groups that share a common goal to improve the education of its young citizens. Programs such as Junior Reserve Officer Training Corps (JROTC), the Office of Naval Research Science, Technology, Engineering and Mathematics (STEM) Program, and the Civil Air Patrol (CAP), to name a few, all have a common goal to instill in

18. "Singapore: Rapid Improvement Followed by Strong Performance" (OECD Report, 2010) www.oecd.org/countries/singapore/46581101.pdf (accessed January 31, 2014), 160.

19. Ibid., 169.

students the values of citizenship, service to their country, personal responsibility and a sense of accomplishment. These programs should be robustly supported. The Project Partnership for All Students' Success (PASS) program should be renewed in 2014 and expanded across all states as it introduces junior leadership curriculum in middle schools and is nested under JROTC programs in high schools. Further, DoD in partnership with DoE, should add incentives to the Troops to Teacher program that offers master degrees to those pursuing academic positions involving STEM or foreign language areas.

As the Operational Tempo (OPTEMPO) slows after our withdrawal in Iraq and drawdown in Afghanistan, the Army should reinvigorate its voluntary Army partnership with local area schools programs as another means for improving citizenship, providing mentorship and learning experiences of children, especially those from single parent households. Mentoring by our junior leaders allows our youth to see mature examples of values and character attributes that may be lacking at home. The end product of our education system, the student, is the future of our military services. We will accept a significant amount of risk to our future military if DoD opts to reduce or eliminate these popular programs as part of budget reductions.

In conclusion, our educational mediocrity is a problem we cannot accept nor afford to ignore. Future education reform needs flexibility and resources that are efficiently used to foster a student's abilities and interests, whether in the sciences, mathematics, technology, or liberal arts. The exposure to all of these subjects develops critical thinking and creative problem-solving skills, which are essential to sustaining the economy, stimulating intellectual innovation, maintaining a world class military and an enriched society to take on the challenges in the 21st century.

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STRENGTH *and* WISDOM

The Recommendation for Establishment of Cultural Units within the Army

Lieutenant Colonel Peter J. Whalen

As the world becomes more complex, the Army's understanding of the environment becomes more important for battlefield success when called upon to execute its missions. Consideration of the motivations and interests of our partners as well as our adversaries is a key element to promoting and defending U.S. national interests. The role of culture is important and will increase in importance in this complex world to prevent future conflict or to defeat future opponents. In a 2008 speech, Defense Secretary Robert Gates saw the value in understanding potential adversaries and their potential motivations for conflict:

> *In the campaign against terrorist networks and other extremists, we know that direct military force will continue to have a role. But over the long term, we cannot kill or capture our way to victory. What the Pentagon calls "kinetic" operations should be subordinate to measures to promote participation in government, economic programs to spur development, and efforts to address the grievances that often lie at the heart of insurgencies and among the discontented from which the terrorists recruit. It will take the patient accumulation of quiet successes over time to discredit and defeat extremist movements and their ideology.*[1]

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1. Secretary of Defense Robert M. Gates, "Speech at the U.S. Global Leadership Campaign, Washington DC" (U.S. Department of Defense, Office of the Assistant Secretary of Defense, Public Affairs, July 15, 2008) http://www.defense.gov/speeches/speech.aspx?speechid=1262

Lieutenant Colonel Whalen is an Army Reserve Military Intelligence Officer who recently served as the G2 of the 7th Civil Support Command in Germany. His Strategy Research Paper (SRP) analyzes European security strategies and defense spending to assess its impact on future U.S. military operations.

The establishment of cultural units within the Army's operating force can allow leaders to apply cultural factors to planning and decision making to better enable strategic landpower, strategic maneuver, and mission command. If the future of the U.S. Army consists of a leaner and more agile force, then it also needs to fight smarter and be smarter about who it fights with and who it fights against.

Cultural units should be established to better institutionalize the capability within the operating force. These units should ideally be assigned at each regionally focused and aligned unit at the brigade level and above. This will support the Regionally Aligned Forces, the Army Service Component Commands (ASCC), and Geographic Combatant Commanders. This unit capability should be developed within all three Army components.

This type of unit will challenge the current way the Army trains, assigns, and promotes Soldiers and Officers. These units need to take a different career progression will need to take Soldiers in and out of the standard unit formations and maintain the same regional focus to develop this capability. In order to develop this set of skills normal command and staff assignments will need to be replaced with rotational assignments between the Generating and Operating Force as well as interagency and academia to develop the Army's cultural bench.

Cultural units will support the commander with key leader engagements, enable interagency contribution, and educate subordinate elements. It will support Army operational and security cooperation planning, intelligence preparation of the environment, and intelligence collection requirements. This unit will have a role to play in all phases of operations across the staff. Its depth can provide a different perspective in framing the problem and in operational design and approach.

The complex environment assessed in Joint and Army publications requires greater focus and depth to help achieve a competitive advantage. Understanding the enemy better than they understand us can be the difference between success and failure. Culture, geography, institutions (military, political, social, and economic), and history are areas that can help U.S. forces understand motivations and interests to improve our potential for meeting national objectives.

There is no standard definition for the term culture in the Defense Department. In its 2009 study on human dynamics, the Defense Science Board defined culture as "the collection of particular norms, beliefs, and customs held by every human that impacts how individuals, groups, and societies behave and interact."[2] These human elements contribute to how states and non-state actors organize, govern and fight.

The Army understands the importance of culture. Operations in Iraq and Afghanistan over the past decade highlight its importance. However, the Army's history has shown that it only realizes the importance after it is engaged in the conflict (as was the case in the Philippine and Vietnam wars).[3] The Army also demonstrates a failure to apply lessons learned to prepare for future conflicts. Cultural understanding will continue to have a significant role to play in all phases of future operations. It is imperative for the Army to prepare its Soldiers on the use of culture to win in the future. In his report, *Out of the Wilderness: Primetime for Strategic Culture*, Colin Gray asserts:

> *Culture is of the utmost importance. It functions at, indeed as, the engine of thought and behavior. Clausewitz tells us that war is a contest between two wills, and the will of a belligerent is the product of moral factors which can be summarized as culture. Sun-tzu was right in insisting on the importance of self-knowledge and of knowledge of one's enemies.*[4]

The future strategic and operating environments require better understanding of our allies and potential adversaries. It will also require U.S. forces to better understand themselves and how allies and adversaries view them. The world's interconnection has added to the complexity of warfighting. U.S. national interests are not automatically supported by allies and partners. The migration from a unipolar world to a multi-polar world is increasing the competition of interests. These competing interests challenge U.S. ability to generate coalitions against a common adversary or will limit U.S. military options. The Army's <u>need for greater</u> cultural understanding is necessary to engage our

2. Defense Science Board Task Force Report on Human Dynamics (Washington, DC, March 2009), 2.

3. Ibid. 4.

4. Colin S. Gray, *Out of the Wilderness: Primetime for Strategic Culture* (Defense Threat Reduction Agency, Washington, DC, July 2006), ii.

partners, know their interests, and how to use those interests to shape their support.

One of the key components which will allow the U.S. to dominate in the future operational environment is overmatch. Overmatch provides the framework that enables the United States to have an advantage over its opponent. One of the goals of an adversary's adaptive strategy is the ability to neutralize U.S. technological overmatch. In a broader sense, the globalized economy challenges the ability of the United States to sustain technological overmatch given the accessibility of technology across the globe and the speed of technological development. In the event that our technological overmatch is neutralized, overmatch in other areas can be achieved with a greater ability to understand our adversaries better than they can understand us.

The complex future environment will compel all actors to become more adaptive and to adapt faster than adversaries. TRADOC's publication, *Operational Environments to 2028: The Strategic Environment for Unified Land Operations*, defines adaptation as, "the ability to learn and to adjust behaviors based on learning, and is closely linked to one's environment and its variable conditions."[5] The Army's ability to adapt quickly will rely not solely on our technological advantage to react, but more frequently on our ability to anticipate adversarial actions and proactively set favorable conditions instead of reacting to the enemy.

The Strategic Landpower White Paper defines Strategic Landpower as, "the application of landpower towards achieving national or multinational (alliance or coalition) security objectives and guidance for a given military campaign or operation."[6] The essential role of Strategic Landpower is to understand, influence, or exercise control within the "human domain."[7] These roles make landpower critical to setting the conditions necessary to prevent conflict and to decisively and successfully execute operations across the military spectrum. The paper states:

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5. TRADOC G-2. "Operational Environments to 2028: The Strategic Environment for Unified Land Operations" (Fort Eustis, VA, August 20, 2012), 4.

6. Strategic Landpower Task Force, "Strategic Landpower: Winning the Clash of Wills" (Washington, DC: Strategic Landpower Task Force, 2013).

7. Ibid.

> *If warfare were merely a contest of technologies, that might be sufficient. However, armed conflict is a clash of interests between or among organized groups, each attempting to impose their will on the opposition. In essence, it is fundamentally a human endeavor in which the context of the conflict is determined by both parties. Operations in the land domain (that must increasingly leverage cyber interactions among people) are most effective at achieving human outcomes that are a prerequisite for achieving national objectives.*[8]

While technology has a role to play in the continuing modernization of the force, the military must have the capability to continually engage its partners and its adversaries to facilitate conflict prevention. The effective use of cultural knowledge helps frame how friendly forces can apply technology to their advantage and determine the potential utility to adversaries – in order to deny or limit its use to put them at a disadvantage.

Strategic Landpower executes strategic maneuver. Major Frank Zachar, in his School of Advanced Military Studies monograph, explains that strategic maneuver is not unique from the tactical and operational definitions:

> *Maneuver at the strategic level does not differ from the concept of maneuver. It is different in only terms of means. The philosophy, techniques, and purpose of maneuver remain the same at all levels war. Strategic maneuver involves the use of instruments of national power to achieve an advantage over an enemy's instruments of power. The purpose of maneuver at the strategic level is to collapse the will of the opposing nation and create an economical victory.*[9]

Along with a military view of the environment, Army commanders and their Soldiers need to have a greater understanding from the perspective of diplomacy, information and economics. Theorist Robert Leonhard articulates the need for military leaders to understand culture and other instruments of national power to achieve success in this

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8. Ibid.

9. Major Frank Zachar. *Strategic Maneuver: Defined for the Future Army* (School of Advanced Military Studies, U.S. Army Command and General Staff College, Fort Leavenworth KS, AY 1999-2000), iii.

complex world. "Political, economic, and cultural elements exist not only as constraints, but as positive opportunities to gain the advantage in conflict."[10] Greater cultural knowledge helps commanders apply military capability to take advantage of cultural norms and values to achieve military and strategic objectives. Conversely this knowledge can help them avoid the use of military capability if potential results hinder the achievement of those objectives.

Cultural knowledge is also a key enabler for the development of mission command within the Army's ranks. The objective of successful mission command is to generate a shared understanding of the environment, problem and strategic intent at echelons above and below.[11] The knowledge of cultures at all levels assists in achieving the shared understanding. As Joint Chiefs Chairman Dempsey observes, this enables commanders, "…to operate at the speed of the problem to gain and maintain advantage."[12] Shared understanding formulates greater trust within and among each echelon. From the experiences of Iraq and Afghanistan, tactical events can have strategic impacts. Cultural knowledge helps the Soldier better appreciate the tactical and strategic relationships that can exploit the human dimension and shape military decision making. It can also generate greater critical and creative thought during the military decision making process.

The implementation of this capability involves a significant investment in an area that may not provide the immediate and tangible results normally desired. It is an investment in making the Soldier more combat effective in a highly competitive and interconnected world through greater knowledge of human behavior. It would also create changes in personnel management and training in order to realize the desired capability. Human interaction and the Army's skill at doing so contribute to the long term value of landpower. The knowledge of

10. Robert R. Leonhard. "The Principles of War for the Information Age" (Presidio Press, CA: 1998), 58, as quoted in Zachar's *Strategic Maneuver: Defined for the Future Army*, 35.

11. Dan McCauley. "The Facets of Mission Command" (*Small Wars Journal*, January 21, 2012) http://smallwarsjournal.com/jrnl/art/the-facets-of-mission-command

12. General Martin E. Dempsey, "Mission Command White Paper" (Washington DC, April 3, 2012), 4.

culture enables a leaner and more agile army the ability shape conditions to prevent war and create advantages when it has to go to war to avoid long conflicts.

In his article, *Culture Centric Warfare*, Major General (Ret.) Robert Scales' observation of war captures the Army's need for this capability, "Wars are won as much by creating alliances, leveraging nonmilitary advantages, reading intentions, building trust, converting opinions, and managing perceptions – all these tasks demand an exceptional ability to understand people, their culture, and their motivation."[13] The greater the Army's to understand people the better its ability to apply strategic landpower, contribute to enabling strategic maneuver, and execute mission command.

13. Major General (Ret.) Robert H. Scales, "Culture Centric Warfare" (*Proceedings* 130 no.10, 2004), 3.

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Health Information Enterprise 2030

Colonel Gary A. Wheeler

The United States is drawing down from the longest period of armed conflict in its history. Army leadership has the opportunity to assess lessons learned, scan the environment, perform adjustments to strategy, and realign capabilities to support future strategic goals. As the Army casts a futures vision, innovative solutions to challenges of future conflicts will be needed. This paper will review the recent experience in theater Health Service Support, provide an overview of current and near future state of Army Medicine, and propose a Health Information Enterprise architecture relevant to 2025 and beyond.

Health information in support of the future Army will need to be broader and deeper than the healthcare information of the current capability set. To support health and mitigate health threats, information will need to integrate and aggregate from the medical and social spheres, garrison and tactical settings, and domestic and overseas environments. Further, advanced, so-called big data analytic capabilities will be needed to identify emerging trends, discriminate medical threat syndromes from anomalies, and gauge population-level health effectiveness measures. Collectively this capability set can truly represent a health information environment that is enterprise in scope.

Colonel Wheeler is a Medical Corps officer who has served as the Medical Command Chief Information Officer/G6, Department of Medicine Chief at Madigan Army Medical Center, and the National Training Center Surgeon. His next assignment will be as the Commander of Lyster Army Health Clinic. His Strategy Research Paper (SRP) endorses the health of Americans as a vital national interest, and proposes the formulation of a national health strategy with development of health information as a strategic asset.

In the mature state, the Health Information Enterprise (HIE) will result from evolutionary development of current capabilities. At the individual Soldier and Family level, medical care will be integrated with life space, electronic health record information and relevant social network information. Relevant sensor data will integrate into the HIE. These data will include those tracked from wearable technologies (such as fitness bands), biometric sensors, and helmet g-force sensors. GPS-enabled apps could capture eating habits and gym attendance. Environmental sensors, to include Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) detectors, weather, pollution, will integrate into the HIE. At the unit level, commanders will have availability to aggregate individual behaviors into unit medical readiness reports. Additionally, risk factors could be identified and tracked with unprecedented sensitivity and clarity. At the population level, emerging trends from warfare or domestic threats could be identified before disease expression. This critical capability will give the ability to identify the next emergent health threat before the peak of disease expression.

A review of the medical threat environment in conflict over the past fifty years is illustrative of gaps in medical knowledge and practice, and informs potential future capability needs. Lessons from the 19th century, advances in germ theory and disease vectors shaped doctrine and practice in the wars of the 20th century. Vaccinations, chemoprophylaxis, and field sanitation drove Disease and Non-Battle Injury (DNBI) rates to historic lows. Troops saw virtual eradication of combat ineffectiveness as a result of dysentery, many forms of malaria, yellow fever, and other infectious diseases. While the constant threat of injury due to CBRNE persists, operationally and strategically, shaping operations have successfully mitigated this threat.

The signature battlefield medical threat has been trauma. Through the Vietnam era, potentially survivable life-threatening injuries from direct and indirect fires predominately involved penetrating trauma to the chest and abdomen. Enemy weaponry and force protection measures changed injury patterns in subsequent conflicts in Iraq and Afghanistan, where significant rises in rates of traumatic amputations

and closed-head trauma resulted in varying severity levels of traumatic brain injury (TBI).

Novel DNBI threats emerged in each major conflict since Vietnam. Agent Orange exposure resulted in a population of veterans with numerous medical issues including concerns of increases in many forms of cancer. Operation Desert Storm brought so-called Gulf War Syndrome, where concerns over oil fires, and nerve or chemical agent exposures manifested in war veterans with skin, cognitive, and non-specific symptoms. As Operations Iraqi Freedom and Enduring Freedom progressed, enemy Improvised Explosive Device (IED) use steadily increased and TBI became a growing concern. The medical community initially lacked an experience base from which to draw practices to effectively screen post-concussive injuries, grade severity of injury, track multiple blast exposures, and render appropriate acute treatment. The latter was of significant operational concern, as the decision to deliver Role 4 care meant evacuation from theater and weeks out of the fight.[1] The cumulative effects of repeated concussive injuries became clearer as troops received unprecedented repeated exposures to IED blasts, however, it was 2006 before a multiple concussion screening tool was developed and deployed. As the conflicts developed into the longest theater engagements in U.S. history, suicides began a steady rise, from rates that were historically below civilian averages, to alarming levels which compelled the Services to institute intervention programs.

Meanwhile in the U.S. domestic environment, the past three decades brought a progressive rise in population levels of obesity and chronic disease, and declines in fitness levels. These have reached levels sufficient to adversely affect those eligible for enlistment. It is estimated that only 24% of young U.S. adults currently meet induction standards.[2] Another readiness threat emergent in the past decade was the downstream effect

1. Roles of health care describe escalating intensity of casualty management capabilities. Role 1 is unit-level medical care. Role 4 is robust multi-specialty hospital care, such as is available at Landstuhl Regional Medical Center. For more information on medical casualty management, see: *Health Service Support*, Joint Publication 04-02, xii and III-1 – III-3.

2. Dr. Curtis Gilroy, Director of the Accessions Policy Office, Undersecretary of Defense, Personnel and Readiness, U.S. Congress, House, Committee on Armed Services, Subcommittee on Military Personnel, Recruiting, Retention and End Strength, 111th Cong., March 3, 2009.

of the prodigious rise in the medically non-ready (non-deployable) troop population. As battlefield injuries generated increasing numbers of troops with permanent medically unfit for duty conditions, the medical and physical evaluation board process was overwhelmed. At its peak, the number of troops going through the disability process rose to over 27,000, equivalent from a manpower perspective to more than five brigades of potential combat strength sidelined.

Recent historical medical threats illustrate the need for robust health information capabilities. The Department of Defense (DoD) presents unique requirements for health information systems. Medical providers and the enterprise need both historic and continuous current healthcare information on the Soldier, Family, unit, and enterprise. Healthcare information capability must span a broad range of environments, from robust role 3 and role 4 infrastructure that strongly resembles the civilian sector, to the low-bandwidth and no-bandwidth environments in forward deployed operations. Additionally, the operating force requires 24/7 healthcare information across the globe. A recent assessment of Combined Joint Operations Area – Afghanistan Health Service Support (CJOA-A HSS) found that health information capabilities were robust in the outpatient setting, but that inpatient information was fragmented due to a theater-specific database. Also, programmatic gaps in training and fielding led to challenges in continuity of documentation of care from point of injury through role 4.[3] Some of this gap is also attributable to the fact that MEDCOM combat development resources are invested nearly entirely in support of the operating force mission set, resulting in less than full integration with garrison-based generating force medical capabilities located in Military Treatment Facilities. These capabilities are developed and sustained jointly by Military Health System programs outside of Service programs.

When considering Soldier and Family health in 2030 and beyond, the health information environment needed to support optimal health will require fundamental changes from current DoD health information capabilities. The medical syndromes from Agent Orange exposure, gulf

    3. Office of the Surgeon General, U.S. Army, *US Health Service Support Assessment, Combined Joint Operations Area Afghanistan* (draft), October 2011, 34-37.

war service, repetitive concussive injury, and even suicides represent new threat patterns. In contrast to the traditional DNBI threats from CBRNE or pandemics, the medical threats prevalent in the last fifty years stemmed from chronic repeated environmental exposures. Single or limited exposure, if mild, may present little concern or risk, and may not result in engagement of the healthcare system. Exposures may occur in the operational environment but manifest in garrison. Conversely unhealthy "exposures" to poor dietary habits, risky social behaviors, or life stressors may present as obesity, accidents, or suicide risk factors in garrison. None of these conditions is well captured by current bio-surveillance capabilities. Current capabilities focus on established diagnoses within the healthcare system over days or weeks, not on symptom complexes in the healthcare, workplace, and social domains that may occur over months to years.

Several current initiatives present near term opportunities to begin to realize health information on an enterprise scale.

First, within the Army, senior leaders have engaged to address improving the health of the force. Directed by Secretary McHugh, the ready and resilient campaign plan is actively and broadly governed by Army senior leadership, including the Army G1, the Surgeon General, and the IMCOM commander. Broad governance will be needed to penetrate the work and home spaces, medical and social spheres. Importantly, strong senior leader governance will be needed to establish information architectures and processes. Establishing a capability spanning healthcare and social domains, personal and community environments, home and work settings will require careful deliberate development of an enterprise level health information architecture, starting with the operational architecture, and ultimately shaping the data architecture. Consideration of a complex requirements set against a background of current privacy laws will require strong governance across a broad coalition of stakeholders.

Second, Army Medicine is undergoing a transformation from a healthcare system to a system for health, in which comprehensive soldier and family fitness is integrated into the healthcare mission. This transformation will result in tighter linkages between the healthcare community and the Soldier and Family communities. The information

reflected in these communities currently reside in largely separate domains: in the electronic healthcare record and in social networks. The future state can and should be tightly integrated in support of the more comprehensive health environment.

Third, the recent establishment of the Defense Health Agency included the standup of health information technology (IT) as a shared service. The three Service health IT forces will be combined, and portfolios merged. The aspirational desired end-state is standardized data centers and clinical applications on the desktop at all Medical Treatment Facilities. The move towards standardized data center, network, and application architecture can facilitate implementation of health information at the enterprise level.

Fourth, DoD is acquiring it's next generation electronic health record to replace the current Armed Forces Health Longitudinal Technology Application (AHLTA) - based system. Numerous lessons learned from the current generation of electronic health records implementation can inform a future state captures and reports health at an enterprise level. Integration of Electronic Health Record (EHR) data with non-healthcare health information should be specified in the requirements of the EHR data architecture.

Fifth, the DoD Chief Information Officer, J6, and CYBERCOM are collectively building the foundation for the Joint Information Environment (JIE), which will integrate innumerable DoD data centers and networks to the tactical edge. As the next generation EHR is acquired and broader health information sources are developed, the JIE will be a critical enabling technology.

Lastly, current efforts in the intelligence arena can inform the future health information domain. Big data analytics, secure cloud technologies, aggregation of disparate data sources across multiple information domains can inform an analogous effort in health information.

Many emergent health threats have manifested in veterans of conflict in the last half century. The threats are characterized by novel exposures and long latencies, presenting challenges in identifying, diagnosing,

and treating at the population level. The Health Information Enterprise is a powerful potential future capability within JIE. Next steps include coordination of the multiple efforts outlined above and articulation of a capability gap between current capabilities and the HIE 2030 as described.

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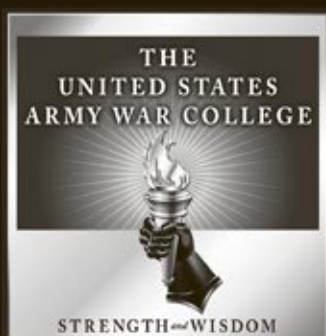
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