Campaign Planning: Tools of the Trade

Third Edition

by

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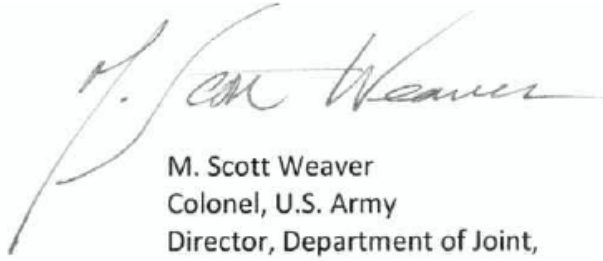
Cover Photo: Mobilization class during World War II. Gruber Hall was used as a classroom for the Command and General Staff College due to the large class sizes during World War II. Instructional Aid Services, Command & General Staff College, Fort Leavenworth Kansas

Foreword

Campaign Planning: Tools of the Trade is designed to be used as a handbook for initially developing campaigns at the US Army Command and General Staff College. This work provides working definitions of campaign concepts and tactics, techniques, and procedures (TTPs) for campaign planners. Key concepts included in this handbook include critical reasoning and creative thinking; ends, ways, and means; center of gravity analysis; developing distinct courses of action; logical lines of operations; targeting techniques; wargaming; and assessment.

Although all of the concepts and TTPs in this handbook are based on joint and US Army doctrine, they represent *a* way to approach campaign planning rather than *the* way that must be followed. The intent is to provide a starting point for developing campaigns with particular emphasis on ensuring unity of purpose in planning and executing campaigns.

As the US military continues its efforts in campaigns in the global war on terrorism, the concepts in this monograph are well worth considering and incorporating in campaign planning.



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Introduction

The purpose for this monograph is straightforward: to provide tools for campaign planning and to assist planners in considering not only the traditional warfighting aspects of campaign planning but also all of the other actions that are necessary for success in winning a war and ultimately "winning the peace." Campaign planning — traditionally thought of as a linear process with distinct phases and sequential actions — is enormously more complex today. To address that complexity, this monograph provides a number of techniques to address campaign planning to win not only the traditional defensive and offensive operations that are inherent in campaigns but also the stability operations and support operations that have gained increasing importance.

The actions the warfighter takes in offensive and defensive operations are not executed in isolation from stability operations; "Phase IV" as a distinct phase of the campaign is not the sole domain of stability operations. Likewise, actions taken in the traditional warfighting phases of defensive and offensive operations can have enormous impact on stability operations. Stability operations may be conducted in all operational environments and during all phases of a campaign or major operation.[1]

Let me put it another way, while running the risk of simplifying how we address warfighting today. The typical warfighting scenario that exists in the US military for operational-level commanders includes a number of phases. First, the organization receives a warning order and begins to prepare for the fight. Once the actual order to deploy is given, units go through a series of actions to alert, marshal, and deploy into a theater. This is followed by the process of reception, staging, onward movement, and integration (RSOI). Units arrive in theater, are met (reception), stage in staging areas to prepare for the fight, move to initial assembly areas, and then are integrated into the plan. It

takes time to build up sufficient forces for offensive operations. Thus, major units normally establish initial defensive positions, expecting that this provides a measure of deterrence to the enemy. They depend on the enemy to wait around long enough for the US military to build enough force to go on the offense. While this is occurring, the US Air Force conducts a number of "shaping operations" to pound the enemy and reduce his combat power to an acceptable level to allow the Army and Marine Corps to have the proper "correlation of forces" for success.

Once there is sufficient relative combat power to the enemy, ground forces "rapidly transition" to the offense. The fight is quick and violent, the enemy is defeated, borders are restored, "mission accomplished" banners are raised, and conditions are established to transition to phase IV" — stability operations. Now civil affairs units and military police (MPs) try to pass things off to a legitimate government as quickly as possible while calls for an exit strategy become louder and louder. This is the fight the US military is well prepared for; this is the fight we have yet to see.

> "The enemy we're fighting is different than the one we'd war-gamed against, because of these paramilitary forces. We knew they were here, but we didn't know how they would fight."[2]
>
> —Lieutenant General William S. Wallace

The enemy we fought in Operation IRAQI FREEDOM (OIF) was not the enemy we expected. The enemy in Somalia was not the enemy we expected, and the same can be said for the fights the US military has fought for the last 50 years. The fight, however, is even bigger than just considering paramilitary forces or insurgents on the battlefield. The fight takes place on territory that includes people who will be living in the same territory long after the US military has left. The fight also includes refugees and displaced persons who must be dealt with by someone; the fight includes

institutions that must be rebuilt so that some measure of normalcy exists for the future; the fight includes the infrastructure that must be rebuilt or transformed because of the ravages of war (and in many circumstances because of the roots and causes of the conflict). Today, victory in combat does not necessarily lead to victory in the conflict, which enlarges the implications of combat operations. Planning, wargaming, and executing campaigns must consider all of these implications.

This is the background for this monograph. The rest will address tools that planners can use to help achieve the effects necessary not only to win in defensive and offensive combat but also to consider the stability operations necessary to win the war. To accomplish this I have borrowed heavily from the thoughts of others to provide some of these tools, especially those of Dr. Joseph Strange formerly at the US Marine Corps (USMC) War College and from the OIF plans of then-Major General (MG) David Petraeus, 101st Airborne Division (Air Assault).

These tools are designed to be used as “starting points” for planners. To relate these tools to an analogy, an artist with a brush full of paint needs certain techniques to start to communicate his vision on the canvas; there has to be some method to start the painting that gets the creative juices flowing. Campaign planning is an art, but some of the science of tactics, techniques, and practices (TTP) can help the process get started and provide coherence throughout the planning process. It is my hope that the tools described throughout this monograph provide this starting point and are of use for campaign planners.

Notes

1. Joint Publication (JP) 3-0, *Joint Operations* (Washington, DC: US Government Printing Office [GPO], 17 December 2006), V-1.

2. Rick Atkinson, *In the Company of Soldiers* (New York: Henry Holt and Co., 2004), 176.

Chapter One

Critical Reasoning / Creative Thinking

The first step in the Military Decision-Making Process (MDMP) after receiving the mission is mission analysis—defining the problem. This is the first step in the scientific method, in developing a thesis, and in any problem-solving model.[1] Knowing precisely what the problem is provides a critical stepping stone to solving that problem, but frequently we stop when we define components of problems before we get to the underlying problem itself. This process is similar to a doctor only defining a patient's symptoms and stopping before making a complete diagnosis of the disease.

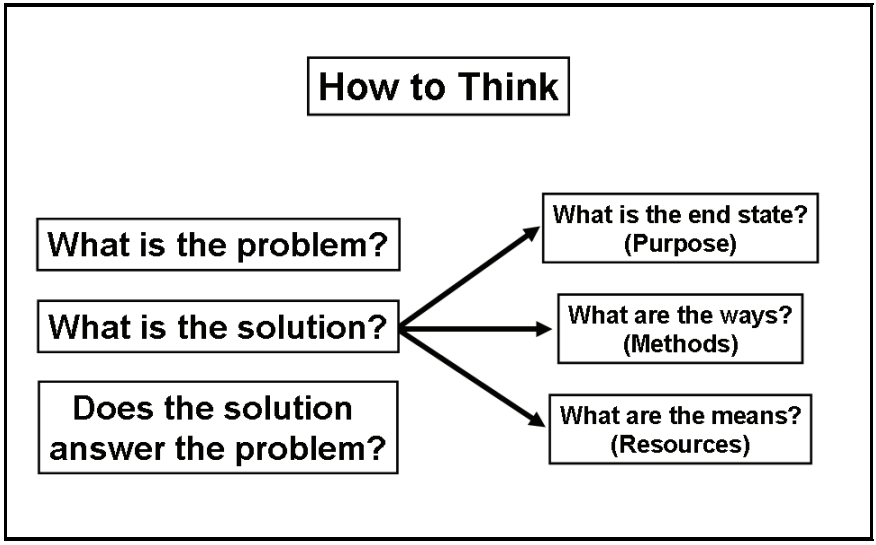


Figure 1-1

Problem solving, in its simplistic state, consists of three primary steps that are identified by the three questions on the left side of Figure 1-1. Before you can jump to the solution of a problem, you must clearly identify and understand the problem. Once you understand the problem, you can then identify a

solution to that problem and then test that solution to see if it really solves the problem at hand.

Sounds easy, doesn't it? But frequently we find that many commanders (and scientists, physicians, and other professionals) are so sure of themselves that they skip this step and go directly to solving problems.

For example, I had a detailed discussion with one of the research psychologists at the Army Research Institute (ARI) several years ago. ARI initiated a study at the National Training Center (NTC) to see how battalion and brigade commanders responded to various scenario changes at NTC. A detailed and complex scenario would be described to commanders, followed by a simple question of "what do you do now?" In most of the situations the commanders would immediately develop a course of action (COA) and describe how they would respond with a detailed COA. Of course, the ARI researchers were testing to see how much time was actually devoted to analyzing the situation and determining the real problem, and the answer was "not much." Because the scenario was intentionally complex, the COAs the commanders developed addressed the immediate problem at hand but not the critical problem.[2]

Soldiers are, by their very nature (or as the product of training and cultural development), rapid decision makers and people of action. Not wanting to seem indecisive and constrained by military culture, decisions are made quickly and with resolve. Of course, sometimes the problem is easy, but time spent in analyzing a problem is time well spent. Therefore, the first step of identifying the problem, or mission analysis, is absolutely essential. The Army's current leadership manual, Field Manual (FM) 6-22, identifies this process as **critical thinking**—"examining a problem in depth, from multiple points of view, and not settling for the first answer that comes to mind."[3]

When the current leadership manual, FM 6-22, was developed the term "critical thinking" was adopted to integrate the two previous concepts of "critical reasoning" and creative thinking." Although there were some good reasons for combining these terms, there is still some utility to understand how they were used previously.[4] In some ways it is still useful to think of these two concepts as separate and important steps in solving problems for planners. Figure 1-2 provides the previous definition of the separate concept of **critical reasoning** from the 1999 leadership manual:

Critical Reasoning Definition

The key concept for critical reasoning is **finding and identifying the real problem**. "Sometimes just figuring out the real problem presents a huge hurdle; at other times you have to sort through distracting multiple problems to get to the real difficulty."* Although critical reasoning is an iterative process that goes beyond the initial understanding of a problem, when explaining the concept it is best to have a clear understanding of the intent behind critical reasoning—which also helps in discerning the difference between the different, but related, concept of creative thinking. This is especially true since some academic writing combines the two concepts as "critical thinking."

—FM 22-100 (1999), paragraph 4-21

Figure 1-2

A key question to ask when doing mission analysis and critical reasoning is "am I working on the right problem?" Do not become so wedded to your analysis that you are afraid to address this key question, even if it changes your whole plan. If you are working on the wrong problem, you will either have to change your plan, be real lucky, or you will fail. It is better to make sure you are

constantly assessing the real problem at hand rather than addressing the symptoms or constantly working on the "25-meter targets." Figure 1-3 provides an excerpt of the definition of critical reasoning out of the 1999 edition of FM 22-100, *Army Leadership*.

Critical Reasoning Description

Critical reasoning helps you think through problems. It is the key to understanding situations, finding causes, arriving at justifiable conclusions, making good judgments, and learning from the experience—in short, solving problems. The word "critical" here does not mean finding fault; it does not have a negative meaning at all. It means getting past the surface of the problem and thinking about it in depth. It means looking at a problem from several points of view instead of just being satisfied with the first answer that comes to mind. Sometimes just figuring out the real problem presents a huge hurdle; at other times you have to sort through distracting multiple problems to get to the real difficulty.

—FM 22-100 (1999), paragraphs 4-19–4-21

Figure 1-3

The key point for critical reasoning is to make identifying the problem a distinct activity. Don't just jump ahead, make quick assumptions, and decide how to fix the problem before you have clearly identified what the problem is. Don't just focus on the "symptoms" of the problem; instead look at the underlying reasons for the problem at hand.

Once you have identified the problem, then it is time to identify solutions to the problem. The Army's current leadership manual (2006) uses both the terms critical thinking and creative thinking to describe the concept. When describing critical thinking FM 6-22 states that "critical thinking is the key to understanding

changing situations, finding causes, arriving at justifiable conclusions, making good judgments, and learning from experience."[5] Under the section entitled "Innovation," the concept of creative thinking is described in FM 6-22 as shown in Figure 1-4:

Creative Thinking (FM 6-22)

Sometimes a new problem presents itself or an old problem requires a new solution. Army leaders should seize such opportunities to think creatively and to innovate. The key concept for creative thinking is developing new ideas and ways to challenge subordinates with new approaches and ideas. It also involves devising new ways for their Soldiers and civilians to accomplish tasks and missions. Creative thinking includes using adaptive approaches (drawing from previous similar circumstances) or innovative approaches (coming up with a completely new idea).

—FM 6-22 (2006), paragraph 6-13

Figure 1-4

The key concept for planners is to understand the process of **creative thinking**. Creative thinking requires you to look at different options to the problem. Again, this can be done by two general ways. The first way is true creative thinking, or being innovative and determining a solution that has never been done before, or if it has been done before, you are unaware of the concept. The second way to develop solutions is to be adaptive; learn from similar situations that have happened in the past, and apply those lessons to the current problem. This contrast between being "innovative" and "adaptive" is an interesting contrast. For most military training, the general approach is to present those being trained with a variety of situations and solutions to those situations. The thought is that when similar situations are again

confronted, there will be a start point, or standing operating procedure (SOP), for responding to those situations. The response becomes secondhand, reducing time to think because known responses can be drawn upon. This works most of the time but not always. Sometimes the situation is completely different, requiring completely new, innovative responses. Of course, if you always respond to certain situations in the same way, you become predictable to an enemy, which necessitates using creativity and innovation in your approach. Figure 1-5 provides a definition of the separate step of **creative thinking**, taken from the 1999 edition of FM 100-22.

Creative Thinking Definition

The key concept for creating thinking is **developing new ideas and ways**—"finding ways to challenge subordinates with new approaches and ideas" and "devising new ways for their soldiers."[1] Examples for creative thinking include how an NCO in World War II used a novel concept to breach the "dragon's teeth" concrete obstacles by pushing dirt over the obstacles instead of using explosives—a different (and creative) approach to solving a problem.[2] Creative thinking includes using **adaptive** approaches (drawing from previous similar circumstances) or **innovative** approaches (coming up with a completely new idea).

—[1]FM 22-100, paragraphs 4-22–4-23

[2]FM 22-100, paragraph 4-7

Figure 1-5

The hardest skill is to be creative while still coming up with solutions that are feasible. This takes practice and creating an environment where unique and innovative responses are encouraged. Everyone on the staff can think creatively. In fact, creative thinking is more likely to be found in those staff officers

and noncommissioned officers (NCOs) who are new and not hindered by "the way it has always been done." Figure 1-6 provides an excerpt of the definition of creative thinking out of the 1999 edition of FM 22-100.

Creative Thinking Description

Sometimes you run into a problem that you have not seen before or an old problem that requires a new solution. Here you must apply imagination; a radical departure from the old way of doing things may be refreshing. Prevent complacency by finding ways to challenge subordinates with new approaches and ideas. In these cases, rely on your intuition, experience, and knowledge. Ask for input; make everybody responsible for, and shareholders in, accomplishing difficult tasks. Creative thinking is not some mysterious gift, nor does it have to be outlandish. It is not reserved for senior officers; all leaders can think creatively.

—FM 22-100, paras 4-22–4-23

Figure 1-6

When I was a planner on a division staff, we always developed three different COAs for our COA development briefings. The first one always represented exactly what we thought the commanding general (CG) had in mind. COA one was an attempt to provide a back-brief of exactly what the commander had envisioned during the mission analysis briefing. COA two was always what the staff thought was the way it should have been done; we would adjust the guidance to what we thought was the best approach or what we thought the CG's guidance "should have been." The third COA tried something "out of the box." Like the other two, the third one had to meet the standards of being feasible, acceptable, suitable, distinguishable, and complete.[6] It could not be a throwaway but had to have something outlandish and totally different.

Briefing the three different COAs was rather interesting. The CG always wanted to see the COAs in order. He would look at the first COA to see if we actually understood what he wanted and was thinking, and as we briefed it, he would make minor corrections on what was "his" COA. He would then review our second one—the "iron major" COA—to see if we were solid in our understanding of tactics and the use of combat power. He would look at it and see a few things that were perhaps good thoughts; then it would be time for the mystery COA—number three. Nothing was out of bounds as long as it met the standards (the screening criteria) and was not a "throwaway." This was our chance to show how creative we could be.

Most of the time the COA the CG ultimately approved used components from all three COAs.[7] Our process for developing them included giving a back-brief, being adaptive, and being creative. The climate in the division encouraged all three actions.

Bottom line: Separate the issues of critical reasoning (identifying the problem) and creative thinking (identifying the solution). Do not cheat on critical reasoning. If you do you may well have the best solution—but for the wrong problem. When developing the solution, use a combination of innovative and adaptive approaches.

Notes

1. Department of the Army Field Manual (FM) 6-22, *Army Leadership: Competent, Confident, and Agile* (Washington, DC: GPO, 12 October 2006), paragraph 6-6; Department of the Army Field Manual (FM) FM 5-0, *Army Planning and Orders Production* (Washington, DC: GPO, January 2005), paragraph 2-24.

2. FM 5-0 includes intuitive decision making as a sometimes appropriate decision-making method based on the complexity of a problem, the experience of the leader, and amount of time available. In the ARI example, the problem was intentionally complex with no time constraint given. See FM 5-0, paragraphs 1-22–1-23 and 2-2.

3. FM 6-22, paragraph 6-6.

4. The terminology in FM 5-0 also appeared to contribute to the confusion with the description of "critical thinkers" as well as the concepts of "critical reasoning" and "creative thinking." In all instances in FM 5-0, the term "critical thinkers" is used as a noun, while the terms "critical reasoning" and "creative thinking" were used as verbs in the 1999 edition of FM 22-100. See FM 5-0, paras 2-8–2-14. To further the confusion, FM 6-22 (2006) still uses the term "creative thinking."

5. FM 6-22, paragraph 6-5.

6. FM 5-0, paragraph 3-113.

7. The COA development briefing presented the COAs before war gaming and COA selection. In a time-constrained environment, the CG could select portions of all three developed COAs to determine a single directed COA for war gaming. Another variant included a hasty war game of all three COAs, followed by a determination of a single directed COA for detailed war gaming. See FM 5-0, paragraphs 3-224–3-228.

Chapter Two

Ends, Ways, and Means

In the previous chapter we looked at two of the questions in "how to think" in terms of critical reasoning (what is the problem?) and creative thinking (what is the solution?). This chapter will address the components of how to approach the solution in terms of ends, ways, and means—or purpose, methods, and resources.

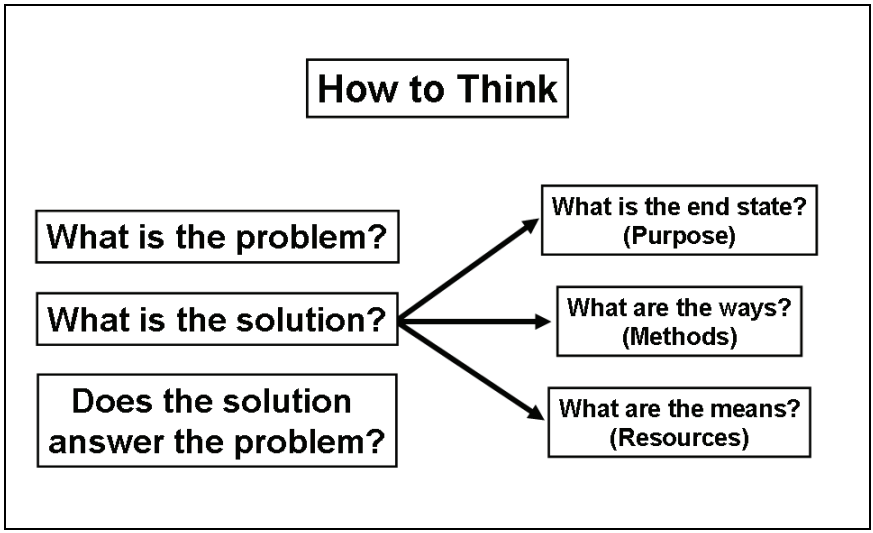


Figure 2-1

The MDMP is essentially a process for problem solving, keying in on three essential elements:

- Defining the problem (mission analysis).
- Creating a solution to the problem (COA development and selection).
- Testing the solution (wargaming).

This second step—creating a solution to the problem—is the key step for developing COAs. Developing a COA consists of three components:

- Determining the **ends** (the purpose for campaign).
- Determining the **ways** (the methods, or how you will achieve the ends).
- Determining the **means** (the resources available to achieve the ways).

End State

A verbal description of what the force wants to achieve at the end of the operations in terms of conditions; for example, "United States out of the country and situations favorable for us to take charge." The end state for an operation or a campaign may not be the final answer and resolution of the conflict, but it will set the conditions for continuing the forces' objectives. The end state for an operation or campaign may also be adapted based on success or failure.

Figure 2-2

This ends-ways-means methodology helps to provide a coherent COA that links actions in the campaign to the purpose for the campaign.

This process, of course, must be followed for not only determining friendly COAs but also for enemy COAs. Both sides have a real purpose for the conflict and have a vision of how they want the campaign to come to conclusion on their terms. The first step is to determine the end state, as shown in Figure 2-2 (this example depicts an enemy end state).

Once the end state for all sides in the conflict is stated in precise terms, it becomes easier to understand the purpose for all of the actions of each side. Each side's actions should, in some way, contribute toward achieving the desired end state. Because plans rarely go exactly as anticipated, it is likely that the end state will be adjusted based on success or failure. The end state should remain fairly consistent throughout a campaign, but it is not locked in concrete.[1] Understanding the end state also helps to determine the center of gravity, which I'll address in the next chapter.

A few words about the concept of the "end state." Developing the end state is not always easy – the definition for "end state" in joint doctrine is found in JP 1-02, *Department of Defense Dictionary of Military and Associated Terms* (as well as other manuals, including JP 3-0): "The set of required conditions that defines achievement of the commander's objectives."[2]

JP 5-0, *Joint Operations Planning*, goes into great detail about two concepts for end state: the "National Strategic End State" and the "Military End State." The "National Strategic End State" is defined as:

> **The National Strategic End State**. For specific situations that require the employment of military capabilities (particularly for anticipated major operations), the President and SecDef typically will establish a set of national strategic objectives. The supported CCDR (Combatant Commander) often will have a role in achieving more than one national objective. Some national objectives will be the primary responsibility of the CCDR, while others will require a more balanced use of all instruments of national power, with the CCDR in support of other agencies. Achievement of these objectives should result in attainment of the national strategic end state — the broadly expressed conditions that should exist at the

end of a campaign or operation. The supported CCDR must work closely with the civilian leadership to ensure a clearly defined national strategic end state is established when possible. Often this end state is uncertain, difficult to determine with clarity, or an estimate based on assumptions and unpredictable conditions in the operational environment. In some situations, operations must begin before a clear understanding of the end state is determined. For all cases, the CCDR must work to frame the problem with the best information available and be prepared to reassess the situation and reframe the problem, as required. Thinking of this "end state" as an integrated set of aims is useful because national strategic objectives usually are closely related rather than independent.[3]

The "Military End State" is defined as:

The Military End State. This end state is the set of required conditions that defines achievement of all military objectives. It normally represents a point in time and/or circumstances beyond which the President does not require the military instrument of national power as the primary means to achieve remaining national objectives. While it may mirror many of the conditions of the national strategic end state, the military end state typically will be more specific and contain other supporting conditions. These conditions contribute to developing termination criteria, the specified standards approved by the President and/or the SecDef that must be met before a joint operation can be concluded.[4]

A couple of observations here . . . First of all, with the greater emphasis on stability operations and the "comprehensive approach," the distinction between the "National Strategic End State" and the "Military End State" may be losing clarity; the

reality is that even though the military may not be needed to accomplish traditional offensive and defensive warfighting functions in a theater, the military may still be needed to meet other stability and support objectives. In addition, the definition for the "National Strategic End State" is still tied to military operations, with the combatant commander "in support of other agencies" and the definition tied to the framework of a "campaign or operation." It doesn't make a lot of sense to have a defined "military end state" that just relates to objectives that "require the military instrument of national power as the primary means." In an integrated "comprehensive approach," it probably makes sense to have a single end state that encompasses the "National Strategic End State" and the "Military End State."

FM 3-07, *Stability Operations*, states:

> Military operations typically focus on attaining the military end state. However, the efforts of military forces also contribute to establishing nonmilitary conditions. Sometimes that is their focus. This is most apparent in stability operations, when integrating military and nonmilitary capabilities is essential to success. Achieving the desired end state in a stability operation requires deliberately coordinating and synchronizing military and civilian efforts. These efforts focus on a shared understanding of the conditions that support a stable, lasting peace. Due to the interrelated nature of the primary stability tasks, these efforts are fundamentally complementary and contribute toward shaping an enduring end state.[5]

Secondly, there is some imprecision in the terms that could lead to confusion. For the "National Strategic End State," achievement of objectives "should exist at the end of a campaign or operation." For the "Military End State," the conditions are

required. This is a big difference, and relates to the definition of the word "objective." JP 1-02 defines an objective as:

> **objective** — 1. The clearly defined, decisive, and attainable goal toward which every operation is directed. 2. The specific target of the action taken (for example, a definite terrain feature, the seizure or holding of which is essential to the commander's plan, or, an enemy force or capability without regard to terrain features).[6]

To me, an objective is something that must be met; you either achieve an objective or you fail. You reach for goals; you must meet objectives. Using this definition, the end state should clearly state what objectives will be achieved to define the conditions for success. It's not that these conditions "should exist" – they are required for mission accomplishment. JP 5-0 states that an end state is "the set of required conditions that defines achievement of the commander's objectives."[7]

Because of this disconnect between end states that list objectives that "should exist" and those that are "required" to exist, there is a tendency to have "aspirational" end states rather than phrasing end states in terms of what are "sufficient" or "bottom-line" end states. A potential solution is to develop end states in terms of conditions in a "band of excellence" – listing the aspirational goals as the upper band and bottom-line "sufficient" objectives as the lower band. The purpose for operations could then be to bring conditions within the band – and develop transitions and follow-on phases of the campaign that are focused on maintenance of the conditions within the "band of excellence." In this way, the "end state" wouldn't be thought of as simply the criteria for termination, but a set of long term, stable conditions that are to be attained – with a plan for the long-term continuation of those conditions.

Even though we speak of **ends, ways, and means**, realistically we actually think of the process in terms of **ends, means, and**

ways. The ends (or end state) drive the purpose of the campaign. The means determine how that can be accomplished and have to be considered before you can realistically determine the ways. Put another way, to be able to accomplish certain ways of approaching the campaign requires you to have resources; the resources, or means, determine just how ambitious or constrained you will be in determining the ways to accomplish the mission.

Before a friendly analysis of ends, ways, and means, the enemy must be thoroughly examined in the same manner. The key to determining the means available to the enemy is found in the intelligence estimate in a paragraph called the "enumeration of enemy capabilities." This list should be a comprehensive list of all of the resources and capabilities available to the enemy. Do not let your intelligence staff officers cheat on this step; it is critical that you assess all the means that are available to the enemy.[8] In a stability operation or insurgency, this is even more important. Not only does the enemy have military forces, but he also will likely use paramilitary forces and insurgents, engage in information operations, and leverage the instability of refugee camps. Today no one wants to take on the United States in a conventional "fair fight" on the battlefield, so our enemies are looking for means to attack us and still get the ends they want. Their means are only limited by their imagination.[9] Many of our enemies will use means that we have not thought of before and would not use even if we had thought of them. Think of those means when considering the means available to the enemy because you may see them in the campaign. Use creative thinking to analyze what the enemy has available to him.

For friendly means, one key document as a starting point is the task organization that indicates allocated and apportioned forces. It is important to have a good feel for all the assets that are available to the campaign planner and when they will be available (force flow). Other critical means that can be brought to

bear in the campaign are assets that do not belong to the commander but are conducting activities in theater that help accomplish objectives. It is critical to be aware of all the nongovernmental organizations (NGOs), private voluntary organizations (PVOs), and other governmental agencies (OGAs) in theater—as well as the media and commercial contractors—and to understand what they can and cannot do. If there is a potential refugee problem in theater, you can be sure that you would prefer to have the NGOs and others help you keep that under control, even if you have to lend a hand once in a while.

During the initial phases of OIF, a lot of non-infantry units found out that they could be used for patrols; a lot of non-MP units found out that they could be used for law enforcement. Do not let "rice bowl" issues keep you from being creative in how to use the assets that are made available in theater. Units can be given nonstandard missions, and planners must be creative in how they apply assets to each problem.

Another important consideration when determining the means available is to think beyond the initial stages of the campaign. For example, engineer assets are critical in both offensive and defensive operations in support of maneuver units, but they may have a different focus and "customer" for stability operations. Rotary and fixed-wing lift will be important for offensive and defensive operations and perhaps even more important for stability operations. You cannot have enough MPs in a stability operation; be prepared to give that mission to other units when the time comes.

Once you have determined the end or end state and you have a comprehensive understanding of the resources and means that are available to you, you can determine the ways—the methods you will use to develop your COA. I will provide a methodology for determining a distinct COA in chapter 4.

Bottom line: Keep in mind the separate components of ends, ways, and means when approaching campaign planning. Determine the ends first, then analyze the means available, and finally determine the ways to accomplish the ends.

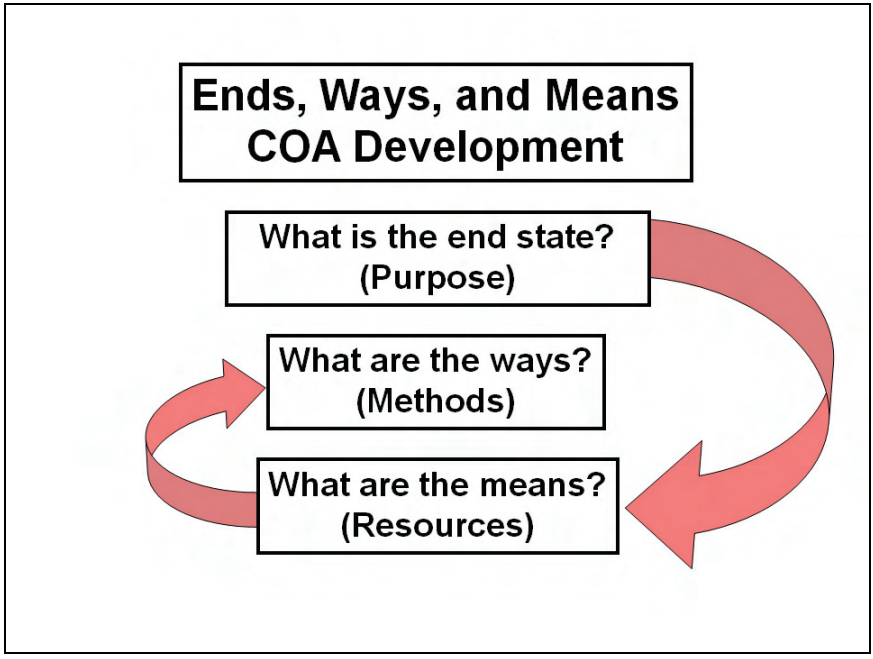


Figure 2-3

Notes

1. “Commanders and their staffs must understand that many factors can affect national strategic objectives, possibly causing the desired national strategic end state to change even as military operations unfold.” See JP 3-0, I-16.

2. Joint Publication (JP) 1-02, *Department of Defense Dictionary of Military and Associated Terms* (Washington, DC: US Government Printing Office [GPO]), 12 April 2001, as amended through 17 October 2008), 187.

3. JP 5-0, III-5.

4. Ibid., III-8.

5. Field Manual (FM) 3-07, *Stability Operations* (Washington, DC: US Government Printing Office [GPO], October 2008), para 4-42.

6. JP 1-02, 391.

7. JP 5-0, III-60.

8. Even though the intelligence staff is responsible for developing the intelligence estimate and the enumeration of enemy capabilities paragraph in the estimate, the entire staff is responsible for considering all the enemy capabilities that are available for the enemy COA and providing input to the intelligence estimate; it is not solely an intelligence responsibility.

9. US forces, as well, are not interested in fighting a fair fight when it comes to warfighting. The United States wants to outclass all opponents and leverage all advantages, including using asymmetric means against enemies—ways the enemy also does not expect the United States to use.

Chapter Three

Center of Gravity Analysis

I'm not a Clausewitzian scholar. I think he was a pretty good observer and theorist of warfare, but he was not inspired from above and his writings do not have the aura of scripture. Nonetheless, I think there are a couple of concepts from Karl von Clausewitz that make a lot of sense. The one that is the most useful from a planning perspective is the concept of the **center of gravity**. Joint doctrine describes centers of gravity (COGs) as "agents or sources of moral or physical strength, power, and resistance—what Clausewitz called 'the hub of all power and movement, on which everything depends . . . the point at which all our energies should be directed.'"[1] The definition that I think is the most useful for campaign planners as a starting point for this concept is in Figure 3-1, which borrows heavily from Dr. Strange, formerly of the USMC War College.

Centers of Gravity

Physical or moral entities that are the **primary** components of physical or moral strength, power, and resistance. They do not just contribute to strength; they **are** the strength. They offer resistance. They strike effective (or heavy) physical or moral blows. At the strategic level they are usually leaders and populations determined to prevail. At the operational level they are almost invariably specific military or insurgent forces. Generally, there is no COG at the tactical level; it has decisive points.

Figure 3-1

I find that the concept of the COG often used as "the hub of movement" is not particularly useful. Heavy packages or equipment will have a COG, but that does not tell you where the

power is or where you can deliver a knockout blow. A running back in football may have a "low COG," but you can take him out every time if you hit his knees. His knees are not really the COG, even though they may appear to be the hub of movement for the tackler.

From a planning perspective, determining the COG should be to discern where the real power is and where a knockout blow can take the enemy out, or at least bring the enemy to a culminating point where he ceases to be effective. At the strategic level this is almost always the population that is resolved to win or the leader who is leading out ahead of the population with firm resolve and dedication. This distinction of the leader vice the population begs the "chicken-egg" argument with a big gray area, but it is still useful to analyze and determine from a planning perspective which of the two is the strategic COG.[2]

> "We shall fight on the beaches, we shall fight on the landing grounds, we shall fight in the fields and in the streets, we shall fight in the hills; we shall never surrender."[3]
>
> —Winston Churchill, 1940

During World War II the strategic COG for Great Britain was arguably Prime Minister Winston Churchill. The population was dedicated to the cause, but the prime minister was out front, committed, and urged the British people to never surrender and to look forward to the future. His urgings held the country together during what some felt was their darkest hour, while Churchill considered it to be their finest hour. Although the British were determined to prevail with the strong support of the United States as an ally, Churchill's was the voice that kept the British encouraged and resolved at every step. In 1940, before the United States' commitment to the war and after the evacuation from Dunkirk, Churchill rallied the British people.

At the beginning of OEF in Afghanistan, the friendly COG for the United States was arguably former President George W. Bush. After the 11 September 2001 (9/11) attacks on the World Trade Center and the Pentagon, former President Bush showed a level of resolve and determination that enabled the fight to continue. Other leaders in the United States at that time could have continued the fight, but probably not with the same level of support that Bush had in the early stages of OEF in Afghanistan and in the early stages of OIF in Iraq. His will and determination was the source of power. Even though many in the United States were not totally committed to fighting a long, protracted war on terrorism, Bush personally demonstrated determination and resolve that sustained support for the war in the early stages – and, at during the latter part of his administration with the decision to move forward with the "surge strategy." Like Churchill, Bush's will and firmness was ahead of the population, urging the people of the United States to remain committed.

The enemy strategic COG in the global war on terrorism, after the 9/11 attacks, was arguably Osama bin Laden or the Middle Eastern terror groups centered on al-Qaeda. This was the core; these were the "physical or moral entities that were the primary components of physical or moral strength, power and resistance." If the United States had been able to "take out" al-Qaeda and the associated terrorist organizations, it would have given the enemy a knockout blow. There may have been other entities that would have caused problems, but they would be greatly weakened and ineffective. Some would argue that the COG was (and has become) a radical fundamental ideology or the many loosely aligned radical terrorist groups, but the spark—the driving force—for this ideology to fight against the United States was Osama bin Laden and al-Qaeda.

For the initial stages of OIF, the friendly strategic COG shifted to domestic and international will and the solidarity of the "coalition of the willing." The enemy strategic COG for Iraq was

Saddam Hussein and his regime. The COG shifted as the focus of the operation shifted after the fall of the regime; the enemy COG became the resolve of sectarian and insurgent fighters to succeed, which no doubt still included some of the leaders of the former regime. With Saddam Hussein out of the picture, the COG for the enemy did indeed shift to other entities and other sources of power. The friendly COG has remained relatively constant, albeit weakened—remaining domestic and international will. With the success of the "surge" and greater stability in Iraq the COG will hopefully shift to the Iraqi government capacity as they take a greater role in governing Iraq.

> "We go forward with complete confidence in the eventual triumph of freedom. Not because history runs on the wheels of inevitability; it is human choices that move events. Not because we consider ourselves a chosen nation; God moves and chooses as He wills. We have confidence because freedom is the permanent hope of mankind, the hunger in dark places, the longing of the soul."[4]
>
> —President George W. Bush, 2005

At the operational level the COG is almost invariably specific military or insurgent forces.[5] Because the operational level of war is more fluid and subject to changes, the COG at the operational level is more likely to change over time. During Operation DESERT STORM (1990-91) and OIF the enemy COG for the Iraqis was the premier Iraqi military force, the Republican Guard. During OIF, however, this quickly shifted to the paramilitary forces, the Saddam Fedayeen—the enemy that had not been wargamed against. During the initial stability operations after the fall of the Saddam regime the operational COG shifted again to insurgent

forces in An Najaf and in the Anbar province; the operational COG continues to shift as the campaign continues to other forces.[6]

The COG at the operational level is, of course, theater-specific and should represent an entity that can be attacked either directly or indirectly. It is preferable, from a planning framework, that there only be one COG, but this is not always the ground truth—there may be more than one. This is especially true in a campaign that has multiple logical lines of operation / effort (more on that later) such as humanitarian operations, offensive operations, and other stability operations that are ongoing simultaneously.

There will no doubt be wide variance between planners on determining the COG at the strategic and operational levels. This should not be cause for concern. The discussion and open debate that lead to the identification of the COGs help focus the staff and commanders on the all-important task of identifying and understanding the problem—an example of **critical reasoning**. The discussion open debate will help to identify the sources of power and assist in identifying how to address these sources—an example of **creative thinking**.

At the tactical level there is disagreement among the services concerning the COG concept. The Army viewpoint is that COG does not apply to the tactical level, but instead there are decisive points that lead to the COG. The Marine Corps believes the COG construct applies at the tactical level; so be it. Your commander will establish the position in your organization. It seems to me to be mostly a matter of semantics. The thought process appears to be similar between how the tactical COG (Marine concept) and decisive points (Army concept) are approached. Figure 3-2 provides the definitions from joint and Army doctrine for **decisive points**.

Decisive Points

Defined by JP 1-02 as "a geographic place, specific key event, critical system, or function that, when acted upon, allows commanders to gain a marked advantage over an adversary or contribute materially to achieving success."[7] FM 3-0 states that "decisive points are not centers of gravity; they are keys to attacking or protecting them. Decisive points apply at both the operational and tactical levels. At the operational level, they typically provide direct leverage against a center of gravity. At the tactical level, they are directly tied to mission accomplishment... A common characteristic of decisive points is their major importance to a center of gravity. A decisive point's importance requires the enemy to commit significant resources to defend it. The loss of a decisive point weakens a center of gravity and may expose more decisive points."[8]

Figure 3-2

Each of the levels of COGs (and decisive points) must have linkage. The identified decisive point (or tactical COG) must have some logical connection to the COG at the operational level, and the operational COG must have some logical connection to the strategic COG. Although this may not be as clean as a "nesting diagram," planners should assess their identified COGs in terms of how "taking out" the enemy COGs at every level contributes to achieving the end state that friendly forces want to achieve. The inverse is also true; planners should consider how the protection and "care and feeding" of the friendly COGs contribute to the enemy who fails to achieve his proposed end state

Planners should consider these three levels of COGs (and decisive points) as a three-dimensional chessboard. If you know that the strategic COG for friendly forces is the will of the

American people and the solidarity of the coalition, that knowledge should make a difference when you develop the plan for information operations even (and perhaps especially) at the tactical level. Planners at the strategic level should consider how the considerations of protecting the friendly COG and attacking the enemy COG impact those at the operational and tactical levels of war. Planners at all three levels should consider the COG linkage at all levels.

Bottom line. Determining the friendly and enemy COGs (and decisive points) at the strategic, operational, and tactical levels is critical for linking plans to the end state. Continually reassess the COGs, and use them as a sanity check to ensure you stay focused on attacking the enemy COGs while protecting the friendly ones.

Notes

1. JP 3-0, IV-9–IV-10.

2. JP 3-0 gives the following description of a strategic COG: "At the strategic level, a COG might be a military force, an alliance, a political or military leader, a set of critical capabilities or functions, or national will." Of course, a leader as a strategic COG may be only true in certain societies; the population in terms of "national will" may be a COG only if the society allows the population a voice. See JP 3-0, IV-10.

3. Prime Minister Winston Churchill, speech before the House of Commons, 4 June 1940, at <http://www.churchill-society-london.org.uk/Dunkirk.html>.

4. President George W. Bush, 2nd inaugural speech, 20 January 2005, available at <http://www.bartleby.com/124/pres67.html>.

5. JP 3-0 gives the following definition of an operational COG: "At the operational level, a COG often is associated with the adversary's military capabilities—such as a powerful element of the armed forces—but could include other capabilities in the operational environment associated with the adversary's political, economic, social, information, and infrastructure systems." See JP 3-0, IV-10.

6. JP 3-0 provides the following guidance for analyzing COGs: "The adversarial context pertinent to COG analysis takes place within the broader operational environment context. A systems perspective of the operational environment assists in understanding the adversary's COGs. In combat operations, this involves knowledge of how an adversary organizes, fights, and makes decision, and of their physical and psychological strengths and weaknesses." See JP 3-0, IV-10.

7. JP 1-02, 148.

8. Field Manual (FM) 3-0, *Operations* (Washington, DC: GPO, February 2008), paragraphs 6-56—6-57.

Chapter Four

Developing Distinct Courses of Action

This chapter will define the components of a Course of Action (COA) and provide some tools for developing distinct COAs, focusing at the operational level of war, or campaign planning. Joint doctrine provides a fairly ambiguous definition of the information that needs to be developed in a COA, as shown in Figure 4-1:

Course of Action Development – JP 5-0

A COA consists of the following information: what type of military action will occur; why the action is required (purpose); who will take the action; when the action will begin; where the action will occur; and how the action will occur (method of employment of forces). The staff converts the approved COA into a CONOPS.[1]

Figure 4-1

In Joint doctrine, the key inputs for course of action development are: the Joint Force Commander's (JFC) Planning Guidance; the JFC's Initial Intent; Initial Staff Estimates; and the results of the Joint Intelligence Preparation of the Operational Environment (JIPOE). The key outputs for course of action development are: revised staff estimates and COA alternatives that include a tentative task organization; a deployment concept; and a sustainment concept – as well as the theater strategic or operational concept, or CONOPS, as described in Figure 4-1 and as shown in Figure 4-2.[2]

Operational Concept – JP 5-0

Planners can develop different COAs for using joint force capabilities (operational fires and maneuver, deception, joint force organization, etc.) by varying the combinations of the elements of operational design (such as phasing, line of operations, and so forth)… Generally, at the theater level, each COA will constitute a theater strategic or operational concept and should outline the following:

(1) Major strategic and operational tasks to be accomplished in the order in which they are to be accomplished.

(2) Capabilities required.

(3) Task organization and related communications systems support concept.

(4) Sustainment concept.

(5) Deployment concept.

(6) Estimate of time required to reach mission success criteria or termination criteria.

(7) Concept for maintaining a theater reserve.[3]

Figure 4-2

For a course of action to be valid, the COA must meet certain screening criteria; it must be adequate, feasible, acceptable, distinguishable, and complete. The definition of "complete" in JP 5-0 also gives insight into what is expected for a valid COA as shown in Figure 4-3.

Note that a valid course of action must also be "sufficiently" distinguishable from other courses of action, but there is no definition or guidance of the criteria to be applied to make this determination. More on this later…

Course of Action Characteristics – JP 5-0

A Valid Course of Action Is –

Adequate — Can accomplish the mission within the commander's guidance.

Feasible — Can accomplish the mission within the established time, space, and resource limitations.

Acceptable — Must balance cost and risk with the advantage gained.

Distinguishable — Must be sufficiently different from the other courses of action.

Complete — Must incorporate:

- objectives, effects, and tasks to be performed
- major forces required
- concepts for deployment, employment, and sustainment
- time estimates for achieving objectives
- military end state and mission success criteria[4]

Figure 4-3

Army doctrine, in FM 5-0, provides additional guidance for the development of courses of action. The steps for developing a COA are shown in Figure 4-4:

Course of Action Development – FM 5-0

After receiving the restated mission, commander's intent, and commander's planning guidance, the staff develops COAs for the commander's approval. The commander's direct involvement in COA development can greatly aid in producing comprehensive and flexible COAs within the available time. The six steps of COA development are:

- Analyze relative combat power
- Generate options
- Array initial forces
- Develop the concept of operations
- Assign headquarters
- Develop COA statements and sketches[5]

Figure 4-4

Just as noted in joint doctrine, for a course of action to be valid, the COA must meet certain screening criteria; the Army uses the screening criteria of feasible, acceptable, suitable, distinguishable, and complete (note that joint doctrine uses the term "adequate" whereas Army doctrine uses the term "suitable" for essentially the same concept). The screening criteria from FM 5-0 to determine a valid COA is shown in Figure 4-5:

Note that, according to Army doctrine, for a course of action to be "distinguishable" it must "differ significantly" from other COAs. There is also a listing of some of the areas that can be used to determine significant differences, with an acknowledgement of the subjective nature of the determination that a COA is distinguishable from other COAs.

Course of Action Characteristics – FM 3-0

A Valid Course of Action Is –

Staffs developing COAs ensure each one meets these screening criteria:

Feasible. The unit must be able to accomplish the mission within the available time, space, and resources.

Acceptable. The tactical or operational advantage gained by executing the COA must justify the cost in resources, especially casualties. This assessment is largely subjective.

Suitable. A COA must accomplish the mission and comply with the commander's planning guidance. However, commanders may modify their planning guidance at any time. When this happens, the staff records and coordinates the new guidance, and reevaluates each COA to ensure it complies with the change.

Distinguishable. Each COA must differ significantly from the others. This criterion is also largely subjective. Significant differences include differences in the—

- Use of reserves.
- Task organization.
- Timing (day or night).
- Scheme of maneuver.

Complete. A COA must show how—

- The decisive operation accomplishes the mission.
- Shaping operations create and preserve conditions for success of the decisive operation.
- Sustaining operations enable shaping and decisive operations.[6]

Figure 4-5

There is another concept that can potentially be used to determine whether a course of action is distinguishable - the concept of the **defeat mechanism** or the **stability mechanism**.

Defeat Mechanisms

A defeat mechanism is the method through which friendly forces accomplish their mission against enemy opposition. A defeat mechanism is described in terms of the physical or psychological effects it produces. Defeat mechanisms are not tactical missions; rather, they describe broad operational and tactical effects. Commanders must translate these effects into tactical tasks. Operational art formulates the most effective, efficient way to defeat enemy aims. Physical defeat deprives enemy forces of the ability to achieve those aims; psychological defeat deprives them of the will to do so. Army forces are most successful when applying focused combinations of defeat mechanisms. This produces complementary and reinforcing effects not attainable with a single mechanism. Used individually, a defeat mechanism achieves results proportional to the effort expended. Used in combination, the effects are likely to be both synergistic and lasting. Army forces at all echelons use combinations of four defeat mechanisms:

- Destroy.
- Dislocate.
- Disintegrate.
- Isolate.[8]

Figure 4-6

The term “defeat mechanism” is not a new concept, but it has only recently been re-introduced into Army doctrine (and was removed from joint doctrine at almost the same time).[7] Twenty years ago the CGSC tactics student text (ST) at Fort Leavenworth, Kansas, ST 100-9, defined the defeat mechanism concept as a component of COA development. The definition of the defeat mechanism at that time was the primary way you would defeat the enemy—that single, decisive action that would take the enemy out. For a tactical operation, it might be using a penetration to take out the enemy’s command and control and logistics structure and bring him to a culmination point or the like. During Operation DESERT STORM, the defeat mechanism could have been the XVIII Airborne Corps’ “Hail Mary” envelopment of the Republican Guard. FM 3-0 provides a current definition of the term “defeat mechanism” as shown in Figure 4-6.

FM 3-0 also gives operational definitions of the defeat mechanisms – which are normally used in combination. The definitions are:

- **Destroy** means to apply lethal combat power on an enemy capability so that it can no longer perform any function and cannot be restored to a usable condition without being entirely rebuilt.
- **Dislocate** means to employ forces to obtain significant positional advantage, rendering the enemy’s dispositions less valuable, perhaps even irrelevant.
- **Disintegrate** means to disrupt the enemy’s command and control system, degrading the ability to conduct operations while leading to a rapid collapse of the enemy’s capabilities or will to fight. It exploits the effects of dislocation and destruction to shatter the enemy’s coherence.
- **Isolate** means to deny an enemy or adversary access to capabilities that enable the exercise of coercion, influence, potential advantage, and freedom of action.[9]

FM 3-0 also describes a new term, "stability mechanisms," that is a similar construct for full spectrum operations. The definition of the term is shown in Figure 4-7:

Stability Mechanisms

Commanders use stability mechanisms to visualize how to employ the stability element of full spectrum operations. A stability mechanism is the primary method through which friendly forces affect civilians in order to attain conditions that support establishing a lasting, stable peace. As with defeat mechanisms, combinations of stability mechanisms produce complementary and reinforcing effects that accomplish the mission more effectively and efficiently than single mechanisms do alone. The four stability mechanisms are—:

- Compel.
- Control.
- Influence.
- Support.[10]

Figure 4-7

FM 3-0 additionally gives operational definitions of the stability mechanisms – which are also normally used in combination. The definitions are:

- **Compel** means to use, or threaten to use, lethal force to establish control and dominance, effect behavioral change, or enforce compliance with mandates, agreements, or civil authority.
- **Control** means to impose civil order. It includes securing borders, routes, sensitive sites, population centers, and individuals.

- **Influence** means to alter the opinions and attitudes of a civilian population through information engagement, presence, and conduct.
- **Support** means to establish, reinforce, or set the conditions necessary for the other instruments of national power to function effectively.[11]

FM 3-0 further describes defeat and stability mechanisms by stating "Defeat and stability mechanisms complement center of gravity analysis. This analysis helps to frame an operational-level problem; defeat and stability mechanisms suggest means to solve it. The analysis reveals the intrinsic vulnerabilities of a given center of gravity; defeat mechanisms describe ways to isolate, weaken, or destroy it."[12] Although FM 3-0 doesn't explicitly state so, it makes sense that both defeat and stability mechanisms may be used in combination to achieve effects (such as using *isolate* and *control* in combination).

COA Development Checklist

- Task organization
- Scheme of maneuver
- Main effort
- Defeat and/or stability mechanisms
- Anticipated use of reserves

Figure 4-8

Let's return to the intent for this chapter – how to develop distinct COAs, focusing at the operational level of war for campaign planning. Planners can use a tool that is a hybrid of the different lists of COA components and the concept of defeat and stability mechanisms to develop a distinct course of action. The list in Figure 4-8 provides a methodology with which to quickly develop a COA, to consider the way the COA succeeds (using the

concepts of the defeat and stability mechanisms), and to ensure that each COA developed is distinguishable from others.

COAs are developed to accomplish the restated mission that resulted from the mission analysis. This restated mission provides the task and purpose for the COA, or the **ends**. The task organization provides in part the **means** to accomplish the COA. How the means are put together to accomplish the mission in the identifying the scheme of maneuver, main effort, defeat and/or stability mechanisms, and anticipated use of reserves provides the **ways** to accomplish the mission.

Developing a COA using these five components provides a skeleton plan—one that can be "fleshed out" with greater details and fidelity as time permits. This methodology can be used for the entire plan or for a component or line of operation of the campaign plan. This methodology can also be used to develop enemy COAs. Here is the broad-brush explanation of the methodology:

Task organization. This is derived from the Annex A (Task Organization) troop list as well as additional assets that are available in theater; organizational structure, command relationships, and geographic locations should be provided. For the enemy COA, draw the task organization from the enumeration of enemy capabilities paragraph in the intelligence estimate.

Scheme of maneuver. This should include shaping operations, decisive operations, and sustaining operations.

Main effort. This is distinct from the concept of the decisive operation but relates to the effort that will receive the most in terms of support (fire support, sustainment, etc.). At one point, only one unit or one effort gets the priority; determine who or what that will be. Of course, the decisive operation becomes the main effort when initiated.[13]

Defeat and/or stability mechanism. As defined above, what is the operational approach, applying combinations of defeat and stability mechanisms, that focuses operations toward establishing the end state?[14]

Anticipated use of reserves. The reserves should have been identified in the task organization, but here you define how the reserves will be used. It is important to make sure that you use the reserves to help you win, not to keep you from losing. The anticipated use of reserves should not be used as a stopgap measure when the plan does not go well. If you are planning to use reserves to help you avoid disaster, it is likely that you have a plan well on the way.

There is an added benefit of using this particular technique in developing a COA. If the entire staff is well versed in this technique, it also becomes a great way to provide a quick assessment (or "summary update") of the campaign or operation. As a briefing technique, you can quickly describe what is going on by checking off the five components of the COA. When the CG asks you for a quick update, you have a way to give it in an organized manner with this technique.

Bottom line. Think of COAs in terms of both simultaneous and sequential actions; all components of a campaign will not be linear. Think beyond the campaign at the operational level. Winning the conflict is more than winning in combat means setting the conditions for the strategic end state. Develop COAs using task organization, scheme of maneuver, main effort, defeat/ stability mechanism, and anticipated use of reserves.

Notes

1. JP 5-0, III-28.

2. Ibid., III-29.

3. Ibid., III-28—29.

4. Ibid., III-28.

5. FM 5-0, 3-29.

6. Ibid., paragraph 3-113.

7. The term "defeat mechanism" was described in Joint Publication (JP) 5-00.1, *Joint Doctrine for Campaign Planning* (Washington, DC: GPO), 25 January 2002. This publication was superseded with the publication of JP 5-0 in December 2006. The term "defeat mechanism" is not included in JP 1-02 – but, then again, the terms "defeat" and "victory" are also not included in JP 1-02.

8. FM 3-0, paragraph 6-42.

9. Ibid., paragraphs 6-43—6-48.

10. Ibid., paragraph 6-49.

11. Ibid., paragraphs 6-50—6-53.

12. Ibid., paragraph 6-54.

13. Ibid., paragraph 5-65.

14. Ibid., paragraph 6-55.

Chapter Five

Logical Lines of Operation

Now that we have discussed the development of distinct COAs, I would like to shift to the concept of **lines of operation** and **lines of effort**. There is a great deal of confusion over the terms because of differences between Army doctrine and Joint doctrine, even though the concepts are relatively easy to understand.

The original concept of lines of operation dates back to Jomini with the concepts of interior and exterior lines. Joint doctrine calls this concept "physical lines of operation" and Army doctrine just calls this "lines of operations." The Joint definition of physical lines of operation is shown in Figure 5-1.

Physical Line of Operations - Joint

A physical LOO connects a series of decisive points over time that lead to control of a geographic objective or defeat of an enemy force. Commanders use physical LOOs to connect the force with its base of operations and objectives when positional reference to the enemy is a factor… Physical LOOs may be either interior or exterior. A force operates on **interior lines** when its operations diverge from a central point and when it is therefore closer to separate adversary forces than the latter are to one another. Interior lines benefit a weaker force by allowing it to shift the main effort laterally more rapidly than the adversary. A force operates on **exterior lines** when its operations converge on the adversary. Successful operations on exterior lines require a stronger or more mobile force, but offer the opportunity to encircle and annihilate a weaker or less mobile opponent.[1]

Figure 5-1

Army doctrine has a similar, yet slightly different, definition for the Army term "lines of operations," as shown in Figure 5-2:

Lines of Operations - Army

A *line of operations* is a line that defines the directional orientation of a force in time and space in relation to the enemy and links the force with its base of operations and objectives. Lines of operations connect a series of decisive points that lead to control of a geographic or force-oriented objective. Operations designed using lines of operations generally consist of a series of actions executed according to a well-defined sequence. Major combat operations are typically designed using lines of operations. These lines tie offensive and defensive tasks to the geographic and positional references in the operational area. Commanders synchronize activities along complementary lines of operations to achieve the end state. Lines of operations may be either interior or exterior.

A force operates on *interior* lines when its operations diverge from a central point. Interior lines usually represent central position, where a friendly force can reinforce or concentrate its elements faster than the enemy force can reposition…

A force operates on *exterior* lines when its operations converge on the enemy. Operations on exterior lines offer opportunities to encircle and annihilate an enemy force. However, these operations typically require a force stronger or more mobile than the enemy.[2]

Figure 5-2

Figure 5-3 provides the graphic explanation of the Jominian concept of lines of operations - this figure is taken from the 2001 edition of FM 3-0, but it still provides a good graphic explanation of the distinction between interior lines of operations and exterior lines of operations.[3]

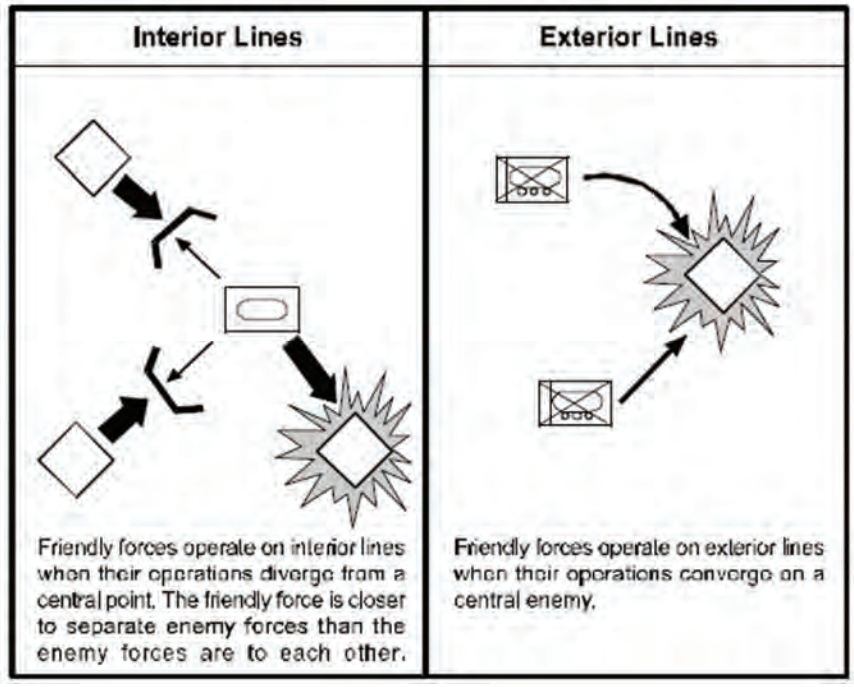


Figure 5-3

Although this Jominian concept is an important concept, this is not the same as what is described as "logical lines of operation" in JP 5-0 and as "lines of effort" in the 2008 edition of FM 3-0. Unfortunately, the terms are similar, but the concepts are not. Logical lines of operation (LLOO) / lines of effort (LOE) is a cognitive planning construct that helps visualize the different types of operations that are taking place simultaneously in an operation or campaign.

JP 5-0 (2006) gives the following description of logical lines of operation (LLOO) as shown in Figure 5-4.

Logical Lines of Operation - Joint

JFCs use logical LOOs to visualize and describe the operation when positional reference to an enemy or adversary has less relevance. In contrast to physical LOOs, a logical LOO focuses more on depicting a logical arrangement of objectives, effects, or tasks. Logical LOOs typically can link multiple decisive points with the logic of purpose to defeat an enemy or achieve an objective. This situation is common in many joint operations, particularly from the theater-strategic perspective. In a linkage between objectives and forces, only the logical linkage of LOOs may be evident. Logical LOOs are particularly useful when working with interagency and multinational partners in either a supporting or supported capacity. For example, a JFC can reflect the tasks and objectives of agencies along separate LOOs and relate these to tasks and objectives along the military LOOs. Logical LOOs also help commanders visualize how military means can support nonmilitary instruments of national power and vice versa.[4]

Figure 5-4

In the 2001 edition of FM 3-0, the term "logical lines of operation" described the same concept. When FM 3-0 was revised in 2008, the term "logical lines of operation" was rescinded and replaced with the term "lines of effort."[5] The intent behind adopting the term "lines of effort" was to draw a distinction between "physical lines of operation" and "lines of effort" and to provide a more meaningful term for the concept. Unfortunately, the joint world has yet to adopt the new term – and the old term "logical lines of operation" still exists in the Counterinsurgency Manual, FM 3-24 (2006).

The description of "lines of effort" (LOE) from the 2008 edition of FM 3-0 is shown in Figure 5-5.

Lines of Effort - Army

A *line of effort* links multiple tasks and missions using the logic of purpose—cause and effect—to focus efforts toward establishing operational and strategic conditions. Lines of effort are essential to operational design when positional references to an enemy or adversary have little relevance. In operations involving many nonmilitary factors, lines of effort may be the only way to link tasks, effects, conditions, and the desired end state. Lines of effort are often essential to helping commanders visualize how military capabilities can support the other instruments of national power. They are a particularly valuable tool when used to achieve unity of effort in operations involving multinational forces and civilian organizations, where unity of command is elusive, if not impractical.

Commanders use lines of effort to describe how they envision their operations creating the more intangible end state conditions. These lines of effort show how individual actions relate to each other and to achieving the end state. Ideally, lines of effort combine the complementary, long-term effects of stability or civil support tasks with the cyclic, short-term events typical of offensive or defensive tasks.

Commanders at all levels may use lines of effort to develop missions and tasks and to allocate resources. Commanders may designate one line of effort as the decisive operation and others as shaping operations. Commanders synchronize and sequence related actions along multiple lines of effort. Seeing these relationships helps commanders assess progress toward achieving the end state as forces perform tasks and accomplish missions.[6]

Figure 5-5

Logical lines of operation/lines of effort are particularly useful when conducting full spectrum operations – combinations of offensive, defensive, stability, and civil support operations simultaneously. FM 3-07, *Stability Operations*, provides the following explanation for lines of effort in stability operations as shown in Figure 5-6.

Lines of Effort – Stability Operations

Commanders use lines of effort to describe how they envision their operations creating the more intangible end state conditions inherent in stability operations. These lines of effort show how individual actions relate to one other and to achieving the desired end state. In these situations, lines of effort combine the complementary, long-term effects of stability tasks with the cyclic, short-term events typical of offensive or defensive tasks. Commanders at all levels use lines of effort to develop missions and tasks, identify complementary and reinforcing actions, and allocate resources appropriately. Commanders may designate actions on one line of effort as the decisive operation and others as shaping operations. They synchronize and sequence related actions across multiple lines of effort; recognizing these relationships helps them to assess progress toward achieving the end state.[7]

Figure 5-6

There are a number of examples of LLOOs/LOEs in doctrinal manuals. The worst example – one that causes some confusion – is found in JP 5-0, Figure IV-7, on page IV-22. This "bad" example shows sample logical lines of operation (LLOO) that are the same as the instruments of national power: Diplomatic, Information, Military, and Economic. Using these instruments for the logical

lines of operation adopts a “means” approach rather than a “ways” approach” to accomplish objectives.

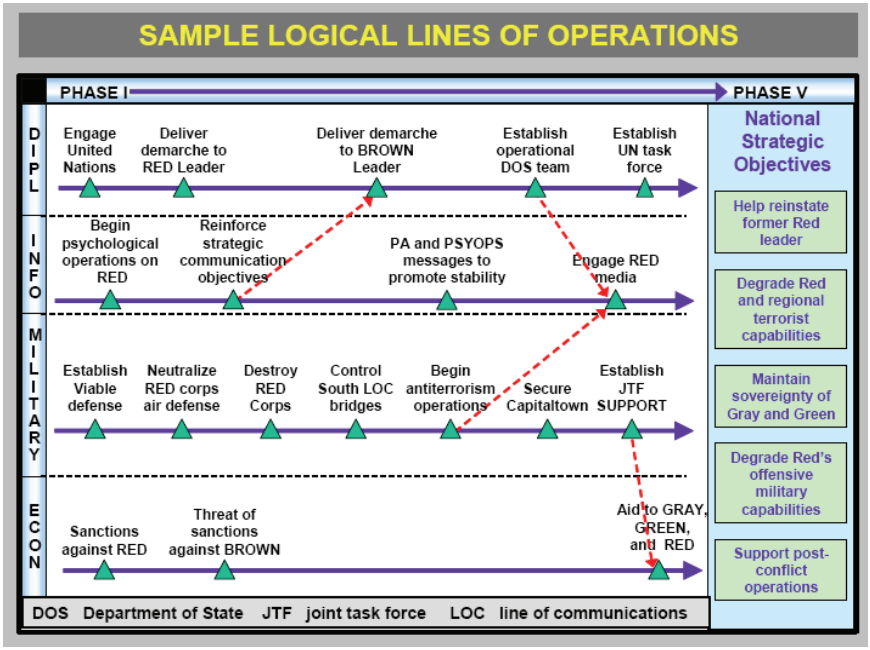


Figure 5-7: Bad Example of LLOOs!

Fortunately, the explanatory note in JP 5-0 gives some relief. The note in paragraph Para 5.h.(5)(d), page IV-22, JP 5-0, states:

> *Other potential alternatives to the instruments of national power for organizing LOOs include the following: by organization (e.g., joint force air component commander, JFLCC); by objective (i.e., an arrangement of tasks, decisive points, or effects oriented at achieving a specific objective); and by function (e.g., maintain security, develop governance, facilitate civil administration)…*

Figure 5-8 shows a good example of logical lines of operation / lines of effort from FM 3-24:[8]

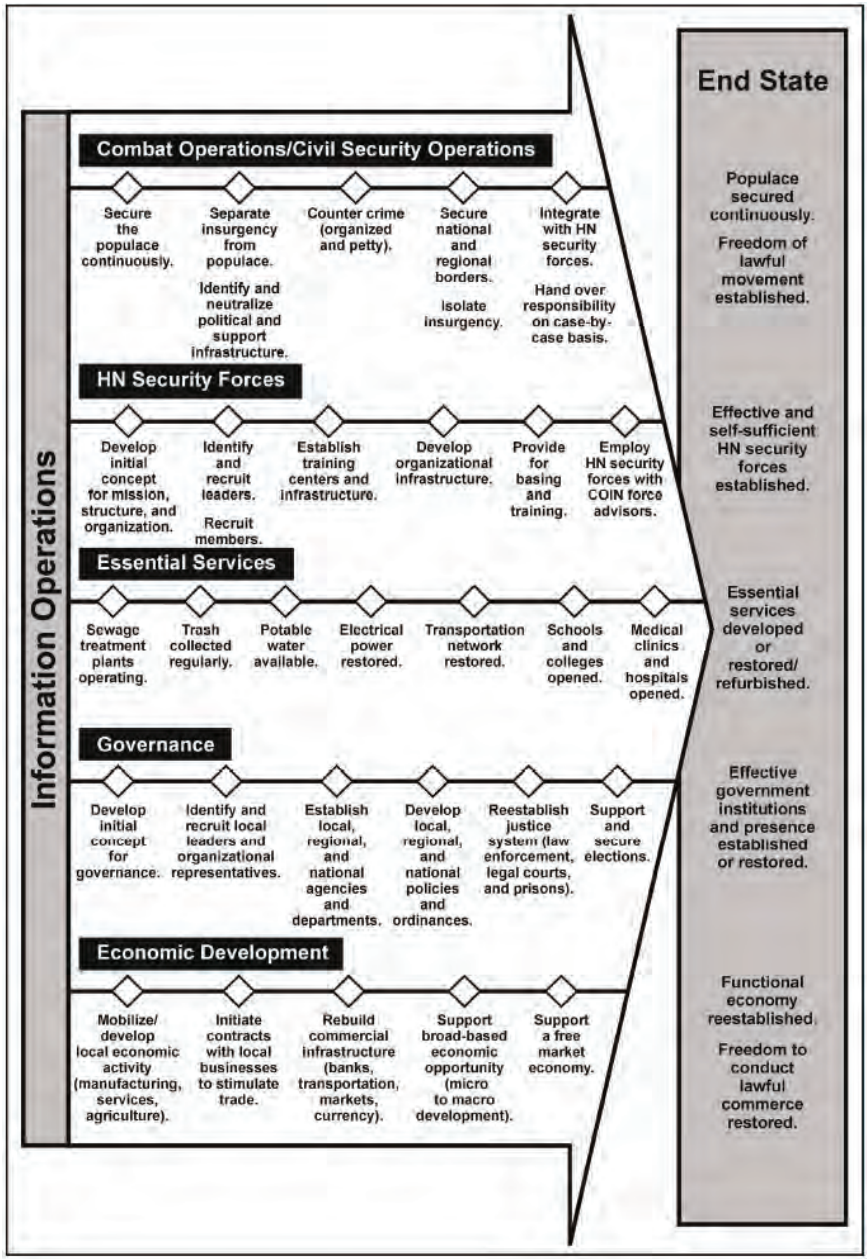


Figure 5-8: Good Example of LLOOs!

The points along the lines of operations are also a source of doctrinal confusion. Our NATO allies use the term "decisive points" along the logical lines of operation; JP 5-0 states that "…a logical LOO focuses more on depicting a logical arrangement of objectives, effects, or tasks. Logical LOOs typically can link multiple decisive points with the logic of purpose to defeat an enemy or achieve an objective"[9]; the 2001 edition of FM 3-0 stated that "commanders link multiple objectives and actions with the logic of purpose—cause and effect"[10]; and the 2008 edition of FM 3-0 states "a line of effort links multiple tasks and missions using the logic of purpose—cause and effect— to focus efforts toward establishing operational and strategic conditions."[11]

It's no surprise that there's confusion. For campaign planning, the best answer appears to have objectives – "the clearly defined, decisive, and attainable goal toward which every operation is directed"[12] – listed along the lines. These objectives should lead to an "end state" that is defined in terms of conditions to be met. The "good" example in FM 3-24, as shown in Figure 5-8 on the previous page, uses this convention. It really doesn't matter a great deal if you depict "decisive points," objectives," "tasks," or "missions" along the lines, as long as you are consistent and it's what your commander understands.

Let me put it all together on what I think the construct of the logical lines of operation should be. Here is what I propose as an operational definition for logical lines of operation.

> A **physical line of operation** is the directional orientation of a force in relation to the enemy; the link between a force's objective and its bases of operation. The **logical line of operation** is a cognitive operational framework/planning construct used to define the concept of multiple, and often disparate, actions arranged in a framework unified by purpose. The actions and objectives in a logical line of operation depict causal relationships that are both linear and

nonlinear. Operational objectives are depicted along a logical line of operation; the same operational objective may be depicted along more than one logical line of operation. All logical lines of operation should lead to the COG.[13]

Now, for some examples of using logical lines of operation / lines of effort… Since campaigns are inherently joint,[14] from this point forward I'll exclusively use the term "logical lines of operation" – while understanding fully that the term is "lines of effort" in Army-speak.

For the initial stages of Operation ENDURING FREEDOM in Afghanistan, the military objectives were "to remove the Taliban regime, destroy al-Qaeda and its operating and training bases, and prevent resurgence of the terrorist support structure."[15] The logical lines of operation developed for these objectives were—

- Diplomatic line (staging, basing, and overflight).
- Special operations line.
- Operational fires line.
- Humanitarian assistance line.
- Building the "coalition of the willing" line.[16]

In the early stages of planning for OIF, General Tommy Franks developed the concept of "lines and slices" to visualize the campaign based on a "policy goal . . . to remove Saddam Hussein from power." For this campaign, he envisioned seven different logical lines of operation:

- Operational fires line.
- Special Operations Forces (SOF) operations line.
- Operational maneuver line.
- Information operations line.
- Unconventional warfare line.
- Politico-military line.
- Civil-military operations line.

In conjunction with the seven logical lines of operation, General Franks developed nine different slices, defined as the "columns" that kept Saddam in power. Franks focused on this concept of slices because "Iraq was a twenty-first century totalitarian police state, with highly centralized leadership that survived and wielded power through a well-developed internal intelligence and security apparatus that spread outward from Saddam Hussein."[17] These slices were the elements that helped the source of power—Saddam Hussein—exert control. The slices that General Franks identified were—

- Leadership.
- Internal security/regime intelligence.
- Weapon of mass destruction (WMD) infrastructure/research and development.
- Republican Guard/Special Republican Guard forces.
- Selected Regular Army forces.
- Territory (south, north, west).
- Infrastructure.
- Commercial and diplomatic leverage.[18]

General Franks developed a matrix to depict the logical lines of operation as rows and the different slices in columns. The matrix indicated that each of the slices impacted different lines of operation. Even though the slices were not operational objectives, they did provide a visualization of how attacking different slices impacted on the different logical lines of operation. For example, civilians, as one of the slices, helped keep Saddam in power. Along the operational fires and operational maneuver logical lines of operation, civilians would not be targeted; they would, however, be targeted along the logical lines of operation for information operations and civil-military operations. Targeting efforts for information operations and civil-military operations were primarily focused on nonlethal means and were focused on stability operations. Operational maneuver and operational fires were primarily focused on lethal means and were primarily

focused on offensive operations. Figure 5-9 provides a similar matrix to the one General Franks developed.[19]

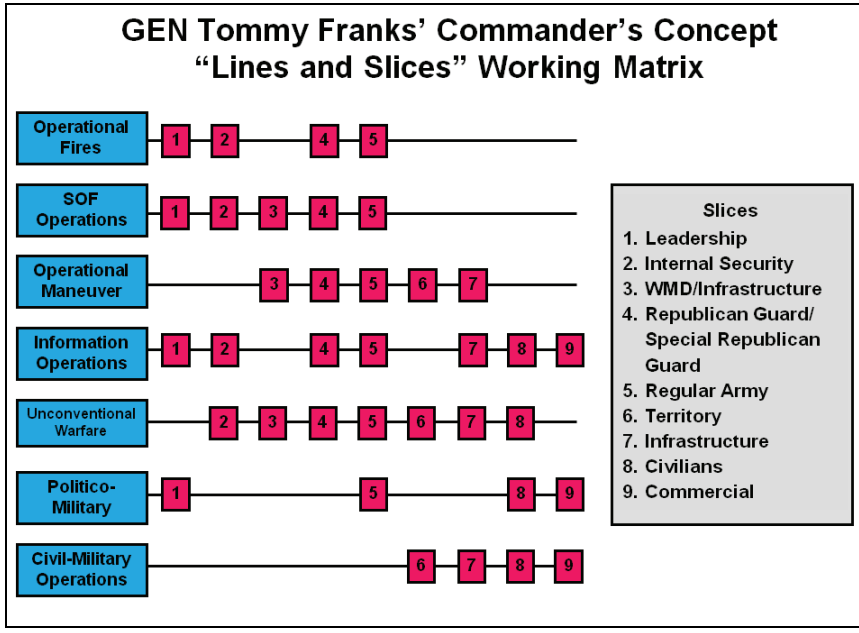


Figure 5-9

The example of General Franks' initial campaign concept for OIF indicates that theater-level commanders were comfortable with the construct of the logical lines of operation because it helped to visualize the different activities in the campaign, particularly when the activities included a combination of the traditional warfighting actions of offensive and defensive operations as well as stability and support operations. The concept of lines and slices is unique to Franks, but it still follows the doctrinal definition that logical lines of operation focus on "depicting a logical arrangement of objectives, effects, or tasks"[20] and allow commanders to "to focus efforts toward establishing operational and strategic conditions."[21]

Unfortunately, the construct that Franks developed did not have the apparent advantage of communicating beyond the initial

offensive actions in OIF. All of the lines and slices were focused on Hussein and not on the necessary stability operations and support operations that were necessary for achieving the policy goal of removing Hussein from power—not on the end state that was, at the time, to establish a stable, democratic Iraq. General Franks' lines and slices led to the COG but not to the end state.

Logical Lines of Operation

Northern Iraq Stability Operations

Rule of law—coalition and local police actions that establish a security environment so that individuals have a realistic expectation that their property rights and economic gains are safe from unlawful seizure.

Economic development/infrastructure recovery—coalition and other international organizations' efforts to encourage investment and rebuild/construct key industries and institutions.

Democratic reform—developing, adopting, and enforcing laws that foster the principles of representative government and respect for human rights.

Combat operations/leadership interdiction—coalition military operations to defeat noncompliant forces and capture high-value targets.

Security sector reform—coalition and other international organizations' efforts to reconstitute/train judiciary, police, border security, intelligence agencies', and military forces.

Information operations—actions taken to keep the public informed of coalition actions, reduce adversary influence, and disrupt the destabilizing forces' decision-making process.

Figure 5-10

There is, however, an excellent example of how to use logical lines of operation that was focused on the end state of in

Northern Iraq. Once the initial offensive and defensive operations were completed, the focus—the main effort—shifted to stability operations. In northern Iraq the 101st Airborne Division (Air Assault), commanded by then-MG Petraeus, was responsible for developing democratic institutions and stabilizing the situation while conducting combat operations throughout the division's area of operations. Figure 5-10 lists the logical lines of operation that Petraeus and his staff developed in northern Iraq.[22]

Operational Objectives

Northern Iraq Stability Operations

Establish a single, transparent, market-based economy fully integrated with the rest of Iraq and its neighbors.

Establish democratic institutions and conduct elections that result in representation of northern Iraq's diverse population.

Establish the rule of law that fosters the people's confidence in the legal and judicial systems.

Establish a national identity among the citizens of northern Iraq that will result in a shared view of themselves as belonging to Iraq.

Repair infrastructure to the extent that basic life services are restored and improved to international standards and natural resources are used to allow for the equitable economic development of all Iraqis.

Establish professional border security forces and military forces to international standards, and base Iraqi military forces that answer to civilian leaders.

Figure 5-11

In addition to the six logical lines of operation, the 101st Airborne Division (Air Assault) developed six different operational objectives in northern Iraq shown in Figure 5-11.

The 101st Airborne Division (Air Assault) then conducted a crosswalk of the logical lines of operation with the operational objectives.

Figure 5-12 provides the crosswalk of the logical lines of operation and the operational objectives. Note that many of the logical lines of operations contributed to more than one operational objective; three of the logical lines of operation contributed to achieving all of the operational objectives.

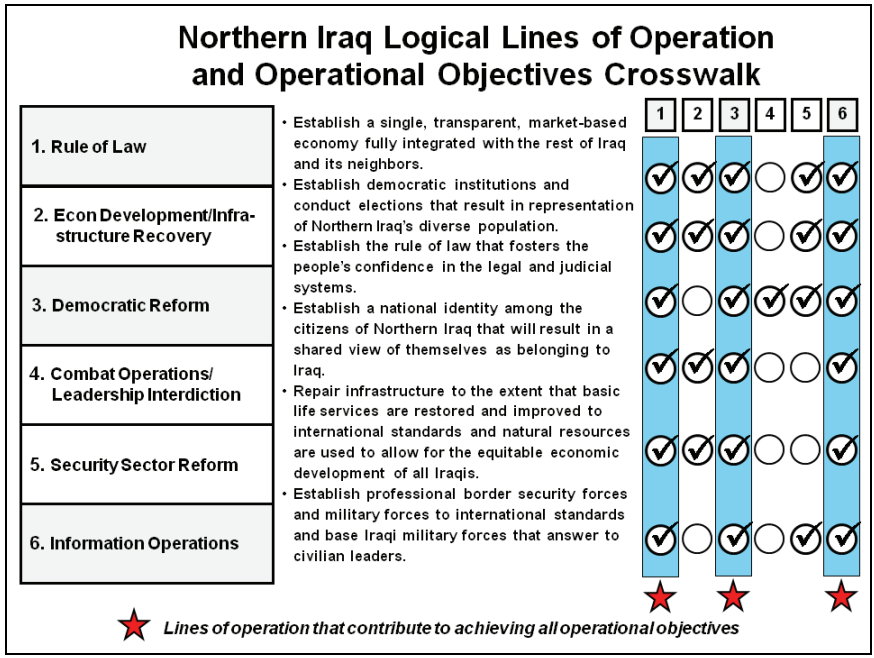


Figure 5-12

For each of the operational objectives, the 101st Airborne Division (Air Assault) developed key tasks to achieve those objectives and measures of effectiveness to determine the progress on meeting the operational objectives and key tasks. In addition, the 101st also determined the key players for each of the logical lines of operation and operational objectives,

coordinating with not only U.S. and coalition forces in northern Iraq, but also with the various NGOs, PVOs, and OGAs in the region, assigning responsibility and coordination authority.

Figure 5-13 shows a different way of depicting the logical lines of operation and how the operational objectives are met along the different logical lines. It is important to note that this chart has the appearance of a linear process, and even though some of the objectives will happen sequentially, they are not necessarily linear and sequential. The note on Figure 5-13 is critical; operational objectives may not be addressed sequentially. In this example, all objectives were addressed simultaneously.

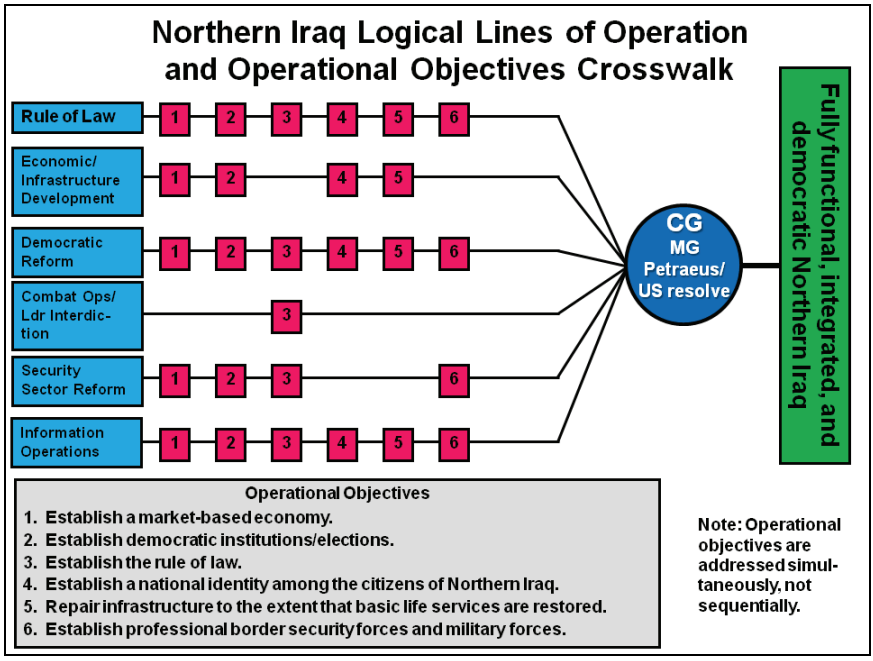


Figure 5-13

Figure 5.13 also attempts to depict that the logical lines of operation and operational objectives were designed to lead to the end state of a fully functional, integrated, and democratic

government in Northern Iraq. Depicting this end state assists planners and executors of the plan in having unity of effort; all the logical lines of operation should lead to the end state. Although this may be the subject of debate, I still contend that the physical or moral entities that are the **primary** components of physical or moral strength, power, and resistance during this period were MG Petraeus and the resolve of the US military.

Figure 5-14 provides an example of a NATO depiction of logical lines of operation. Note that NATO uses the concept of decisive points rather than operational objectives in their use of the construct.

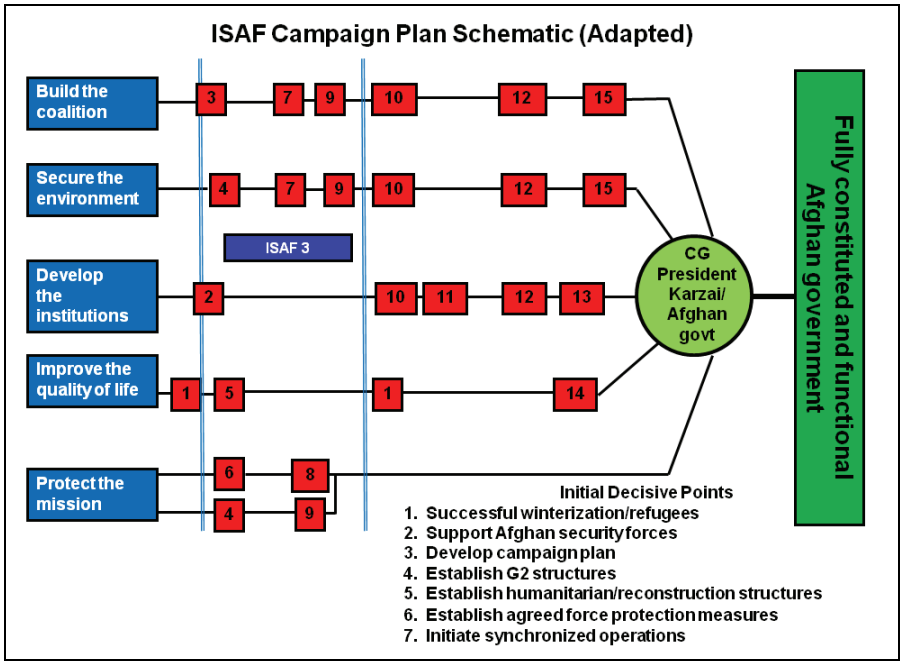


Figure 5-14

Additional Considerations of Logical Lines of Operations

There are several other considerations that I would like to briefly discuss before moving on to the next chapter that concern

using logical lines of operation. The first consideration in using logical lines of operation is using them during **wargaming** and **rehearsals**.

First, a big advantages of using logical lines of operation, especially when the logical lines of operation are a mixture of offensive, defensive, stability, and support operations, is that this allows you to consider actions in the entire theater while wargaming and conducting a rehearsal. When conducting a wargame of a COA, you simply address every one of the logical lines in each wargaming move. This method forces the staff conducting the wargame to not only consider the comfort zone areas of offense and defense for each move but also to address other areas such as humanitarian operations and civil affairs in each move. For rehearsals, the same applies—all rehearsals or "rock drills" should include those involved in the entire campaign, including stability operations. This makes sure the enemy you wargame against is more comprehensive than the standard warfighting scenario (more on wargaming in a later chapter).

The **second** consideration is that using logical lines of operation allows you to **assess the effects** of each of your operational objectives and key tasks against each line of operation. An operational objective that is primarily thought of in terms of offensive actions may have an effect on a stability line. For example, you may want to destroy a television or radio tower because enemy insurgent forces are using it to pass military messages. Destroying that television or radio tower may be a wonderful operational objective by eliminating insurgent forces' ability to attack friendly forces, but it could have a negative effect later on in providing a forum for the legitimate government to communicate to the populace. Each operational objective and key task should be considered in terms of each logical line of operation, and planners should determine if the second- and third-order effects of those objectives and key tasks are positive or negative effects.

Hopefully, the assessment of effects of operational objectives and key tasks will be apparent while developing the courses of action. If not, it should be apparent during the wargaming process and the rehearsal if planners ensure that each logical line of operation has a proponent that considers the effect of each action on their logical line of operation.

The **third** consideration is that the logical lines of operation construct is a model – it's the representation of the plan that should be used to enhance understanding. In fact, it's not the complete model – it's an "element of operational design" that is used (along with other elements such as center of gravity and decisive points) to help communicate the intent of the commander and to help focus efforts.

As a model, however, it is not complete and not the entire plan – it's just an aid in understanding how to translate plans into action. It should, if used properly, assist in understanding how all the "pieces and parts" of a campaign are taking place and facilitate initiative. Campaigns are complex creatures, with a hundred moving parts… and the construct of Lines of Operation can help all involved see how their part fits into the whole.

Fourth, the logical lines of operation construct should not be thought of as a series of sequential actions – all of the actions on the lines of operation are not necessarily sequential and linear. Because there are so many moving parts in a campaign, it is important to see how all of these actions lead to the conditions identified in the end state – which means that many of the actions and objectives on the lines of operation will be simultaneous. Of course, some actions will necessarily have to precede other actions – but the overall construct of lines of operation is intended to represent how all of the actions lead to the end state.

Fifth, objectives may appear on more than one line of operation. An objective may have significant impact on more than one logical line of operation; for example, an objective to

"establish police stations" may be significant for logical lines of operation such as establishment of the rule of law, security, and information operations. Depicting this objective along all three lines provides a different "lens" to look at how the objective contributes to the overall conditions in the end state. This provides greater coherence to the purpose of "establishing police stations" and helps to identify second and third order effects on how those police stations are established.

A **sixth** consideration is that using the construct of logical lines of operation can assist in identifying second and third order effects of operations. This is true in the initial wargaming process, as well as during subsequent updates and assessments of operations (such as during BUAs). As different activities are conducted, these activities should be assessed in terms of all of the lines of operation for their effect on the overall campaign plan.

Seventh, logical lines of operation should be identified in terms of ways, not means. The "Establishment of the Rule of Law" logical line of operation will have objectives that use all of the available means and resources to a commander. Think of logical lines of operation as a construct to describe "how" the campaign is being fought to integrate all of the available resources, thereby enhancing unify of effort… a means approach (such as having LLOOs depicted as diplomatic, information, military and economic) tends to compartment actions and doesn't contribute to the "comprehensive approach."

Bottom line. The construct of logical lines of operation provides a methodology with which to visualize campaigns, particularly when there are a variety of offensive, defensive, stability, and support operations that occur simultaneously. Using the logical lines of operation enables the planner to synchronize activities and ensure that all operations contribute to achieving the desired end state. Using logical lines of operation also helps

ensure that offensive, defensive, stability, and support operations are integrated in the plan and that the effects of all of the operational objectives and key tasks are considered in terms of each logical line of operation.

Notes

1. JP 5-0, IV-20.

2. FM 3-0 (2008), paragraphs 6-62—6-64.

3. Field Manual (FM) 3-0, *Operations* (Washington, DC: GPO, June 2001), Figure 5-2.

4. JP 5-0, IV-21.

5. FM 3-0 (2008), D-3.

6. Ibid., paragraphs 6-66—6-68.

7. Field Manual (FM) 3-07, *Stability Operations* (Washington, DC: GPO, October 2008), paragraph 4-54.

8. Field Manual (FM) 3-24, *Counterinsurgency* (Washington, DC: GPO, December 2006), 5-5.

9. JP 5-0, IV-21.

10. FM 3-0 (2001), paragraph 5-37.

11. FM 3-0 (2008), paragraph 6-68.

12. JP 1-02, 391.

13. This definition draws heavily from the description of logical lines of operation found in an excellent monograph produced at the School of Advanced Military Studies, Fort Leavenworth, Kansas. See Major Mario A. Diaz, *Prosperity or Perdition: Do Lines of Operation Apply in Stability Operations?* 2003, 56-57.

14. JP 5-0, IV-2.

15. General Tommy Franks with Malcolm McConnell, *American Soldier* (New York: Harper Collins, 2004), 338.

16. Ibid., 338.

17. Ibid., 336.

18. Ibid., 338-339.

19. Ibid., 340.

20. JP 5-0, IV-21.

21. FM 3-0 (2008), paragraph 6-66.

22. I am indebted to General David Petraeus for allowing me to use excerpts of briefing slides used during operations of the 101st Airborne Division (Air Assault) in northern Iraq and to Lieutenant Colonel Bill Abb, former G3 Plans Officer, 101st Airborne Division (Air Assault), for his explanations of the slides and processes of the 101st Airborne Division (Air Assault) in northern Iraq.

Chapter Six

Targeting: Critical Vulnerabilities

This chapter will describe the process of defining critical vulnerabilities as a targeting methodology. Dr. Joe Strange, formerly at the USMC War College, developed this methodology. The chapter provides another tool for campaign planners to consider when linking targets to the center of gravity and end state. Most of this chapter is drawn heavily from Dr. Strange's monograph, but I have made some modifications that I will clearly identify.[1]

To understand the critical vulnerabilities construct, it is important to understand the key terms. Here are the terms I will define for this chapter:

Terms of Reference

- Centers of gravity (COG)
- Critical capabilities (CC)
- Critical requirements (CR)
- Critical weaknesses (CW)
- Critical vulnerabilities (CV)

The first term is centers of gravity (COG). Although this term was the subject of chapter 3, I want to review the concept and indicate the differences between my definition and Strange's definition. The biggest difference is the concept of decisive points at the tactical level—the Marine Corps believes that COG applies at the tactical level; the general consensus in the Army is that COG only applies at the strategic and operational levels. Hence, the last sentence in the definition shown in chapter 3 and reviewed in Figure 6-1 is mine, but the focus of this monograph and this chapter is at the strategic and operational levels, so this

should not pose a problem in applying the critical vulnerabilities construct at this point.

Centers of Gravity

Physical or moral entities that are the **primary** components of physical or moral strength, power, and resistance. They do not just contribute to strength; they **are** the strength. They offer resistance. They strike effective (or heavy) physical or moral blows. At the strategic level they are usually leaders and populations that are determined to prevail. At the operational level they are almost invariably specific military or insurgent forces. Generally, there is no COG at the tactical level but decisive points instead.

Figure 6-1

The next concept is critical capabilities (CC). Strange identifies CC as the "primary abilities which merit a Center of Gravity to be identified in the context of a given scenario, situation, or mission." These include physical, mental, financial, or legal power to perform an action.[2] CC represent the overarching ways that resources are applied (and hence, "critical") to accomplish the objectives or end state. CC are normally expressed in verb form (and specifically in the infinitive form – such as "to project"). For example, the CC for a theater commander could be his critical capability **to project military power** into a theater of operations. In this example, the operational COG is the theater commander and theater-level forces. For a strategic-level example, a CC could be expressed as the US President's ability **to lead a concerted and sustained campaign** in order to defeat the extremist Middle Eastern terror groups. In this example, the strategic COG is the US President leading a determined US population that is determined to prevail. Figure 6-2 defines CC.

Critical Capabilities
Verb!

Every COG has some primary ability (or abilities) that makes it a COG in the context of a given scenario, situation, or mission, including phases within campaigns or operations. Mostly simply stated, what can this COG do to you that puts great fear (or concern) into your heart in the context of your mission and level of war? Within a CC, the key word is the **verb**: for example, **to destroy** something, **to seize** an objective, or **to prevent** you from achieving a mission.

Figure 6-2

Before we go any further, it is important to acknowledge that JP 5-0 has a short description of the "critical factors" used for center of gravity analysis – including **critical capabilities**, **critical requirements**, and **critical vulnerabilities**. The definitions from JP 5-0 are shown in Figure 6-3:

Critical Factors – JP 5-0

Critical Capability — a means that is considered a crucial enabler for a center of gravity to function as such, and is essential to the accomplishment of the specified or assumed objective(s).

Critical Requirement — an essential condition, resource, and means for a critical capability to be fully operational.

Critical Vulnerability — an aspect of a critical requirement, which is deficient or vulnerable to direct or indirect attack that will create decisive or significant effects.

Figure 6-3

Note that the definition from JP 5-0 for "critical capability" defines a CC as a means – but this is not a helpful way of thinking of a CC. A critical capability should be thought of as "ways" that a force applies essential means to accomplish objectives; using the infinitive verb form (to do something) reinforces this concept that a CC is the "way" to apply resources. These resources, or means, are known as critical requirements (CR). Dr. Strange's definition of CR is "essential conditions, resources, and means for a Critical Capability to be fully operative."[3] This definition of CR is similar to the definition in JP 5-0. Critical Requirements should be described in noun form.

In the previous examples, the theater commander had the CC **to project** military power into a theater of operations – this is the way or method that the commander would be able to accomplish his objectives – and this is a critical capability that would cause great concern for an adversary. This critical capability, to be fully effective, would have certain critical requirements, including secure bases, strategic transport assets, intelligence on the situation in theater, sufficient trained forces for deployment, and the like. These critical requirements (CR) enable the theater commander to accomplish the critical capability (CC) of projecting forces into a theater of operations.

For the President of the United States to accomplish the critical capability (CC) "to lead a concerted and sustained campaign in order to defeat the extremist Middle Eastern terror groups," the critical requirements (CR) would include the US population's committed support (and therefore support from Congress) for the long war, as well as strategic-level intelligence on the terror groups. Figure 6-4 defines Critical Requirements (CR) and provides some examples.

Critical Requirements
Noun!

Conditions, resources, and means that are essential for a COG to achieve its CC. Examples are—

- Good weather, precise intelligence, fuel and ammunition resupply, chemical gear, and the ability to go 35 miles per hour across open desert for 6 hours.
- Force X must accomplish its mission as a precondition before force Y can accomplish its mission.
- A robust sea train for a warfighting fleet must operate for long periods at sea.
- Political leader Y needs no less than X percent of the popular support.
- International support for a given US military operation to provide political credibility, regardless of overwhelming US military superiority over country Y.

Figure 6-4

The next step in Strange's construct is the concept of critical vulnerabilities (CV). I believe there is an additional consideration before you look at vulnerabilities—that of critical weaknesses (CW). Before you can determine what is vulnerable (and susceptible to attack), you must first determine what the weaknesses or deficiencies are in a force's critical requirements (CR). Critical weaknesses are also described in noun form. Figure 6-5 explains the concept of critical weaknesses (CW).

Critical Weaknesses
Noun!

Those CR, or components thereof, that are deficient or lacking for the enemy. These differ from CV because they may not significantly contribute to achieving a CC, they may not be vulnerable to attack by friendly forces, or they may not be "targetable" entities. Understanding CW may provide insight into the specific COA the enemy may choose and the means through which the enemy may try to accomplish his objectives. For example, the enemy may easily understand that he has a CW in that he cannot fight US forces in a conventional battle. Because of this weakness in means, he chooses other ways to fight and achieve his objectives. However, in the COA he selects, there will (hopefully) be inherent CW. Generally, CV are a subset of these inherent CW.

Figure 6-5

The step of identifying critical weaknesses is not found in Dr. Strange's monograph or in JP 5-0; therefore, this step may be a mental step prior to determining critical vulnerabilities. Once you have determined the critical weaknesses (CW), you can then analyze those weaknesses to determine which are also vulnerable to attack—and thereby contribute to the opponent's plan if attacked—and can also be targeted by the opponent. This analysis provides a list of Critical Vulnerabilities (CV) to consider: an aspect of a critical requirement which is deficient weaknesses; is vulnerable to attack, and can be targeted. The definition of a critical vulnerability (CV) is shown in Figure 6-6. Critical Vulnerabilities (CV) are also listed in noun form.

Critical Vulnerabilities
Noun!

Those CR, or components thereof, that are deficient or vulnerable to neutralization or defeat in a way that will contribute to a COG failing to achieve its CC. The lesser the risk and cost in friendly lives, the better. CV may, unusually, be of the silver-bullet type such as where one precisely targeted cruise missile destroys the enemy's leaders and results in an immediate end to a conflict. More typically, CV are of the lead-bullet type where final success can only be achieved by focusing on a combination of vulnerable CR that can be neutralized, interdicted, or attacked simultaneously or sequentially. Here, it is the **cumulative** effect that produces decisive results, seeking a series of successive battlefield advantages that will lead to unbalancing and eventually culminating the enemy, with or without a final dramatic decisive act.

Figure 6-6

As stated earlier, a critical capability (CC) is a capability that causes great concern for an adversary; this CC is how a force uses his power against the adversary. A critical vulnerability (CV) provides an opportunity for the adversary to attack that power.

The next series of figures will provide examples of how this construct works to "connect the dots" from the COG to the CC to the CW to the CV. The first set of figures addresses COG analysis of the enemy immediately after the 9/11 attacks. The second set of figures will address the friendly COG in the post-9/11 war on terrorism.

War Against Terrorism, Post-9/11
Enemy COG Analysis

COG

Enemy Middle Eastern terrorist groups centered on al-Qaeda.

CC (Verb!)

To create the conditions whereby extremist groups can topple moderate Middle East regimes through persistent terrorist attacks against US and indigenous targets, with or without forcing the United States to withdraw from the Middle East.

Figure 6-7

In this case, the COG is identified as enemy Middle Eastern terrorist groups that centered on al-Qaeda – al Qaeda and Associated Movements. These groups, especially al-Qaeda, were the **primary** components of physical or moral strength, power, and resistance. As they demonstrated on 9/11, they have offered resistance and continue to do so.

The CC of these groups is stated as a verb—to create the conditions under which to topple moderate Middle East regimes—which leads to the end state of finally toppling Western governments, especially that of the United States. The CC is shown to include "with or without forcing US withdrawal" as an acknowledgment of the proposed end state at this time; toppling Middle East regimes today is the CC that these groups hope to achieve to set the conditions for their overall long-term end state. If the immediate post-9/11 end state is achieved, the objectives of these groups would shift to a broader end state of toppling Western governments, focusing on the United States – and

requiring different critical capabilities. To enable the current fight and capabilities, there are inherent CR, as listed in Figure 6-8.

War Against Terrorism, Post-9/11
Enemy COG Analysis

CR (Noun!)

- Secure bases for training, logistic support, and command.
- Continued recruitment of committed followers for the long war:
  - —The cause—the Arab-Israeli conflict.
  - —Transmit the message.
- Charismatic leadership.
- Financial backing to position and sustain long-term "sleepers" in Western states.
- Technological "know-how" to develop and use weapons of mass destruction to force the eventual ending of the West's will to win.

Figure 6-8

These CR are necessary (critical) for the enemy to achieve the CC. An analysis of these requirements indicates that there are some inherent weaknesses. Although these requirements may have been achievable before 9/11, many of the CR have become more difficult to procure and can be possibly exploited; "shoring up" each of these weaknesses is necessary for the enemy to have the CR available in order to achieve the CC. To develop the CW list it is important to consider that not all of them represent a targetable entity—it may be a weakness, but it is not vulnerable unless the opposing side (the friendly side in this case) **can** and **wants** to attack it. Figure 6-9 provides the CW assessment.

Based on a review of the CW, there are a number of CV—deficiencies that the enemy has in his CR that are also exploitable and contribute to success in the eyes of the friendly commander.

War Against Terrorism, Post-9/11
Enemy COG Analysis

CW (Noun!)

- Dependence on refuge for training and planning.
- Lack of traditional military forces.
- Decentralized, compartmentalized operations.
- Long lead time for detailed planning.
- Personality dependence.
- Difficulty in infiltrating Western society.
- Legitimacy in the political arena.
- Dependence on use of "surprise" to achieve results.
- Lack of coherent message throughout the world.
- Requires periodic success for recruiting efforts.

Figure 6-9

There may be a tendency at this point to confuse the concepts of COG and CV; by definition, a COG cannot also be a CV.[4] The COG consists of the "primary components of physical or moral strength, power and resistance. They don't just contribute to strength; they ARE the strength," while a CV consists of those components of critical requirements that are deficient, are targetable, and thereby vulnerable to neutralization or defeat in a way that will contribute to a center of gravity failing to achieve its critical capability.

From a systems standpoint, you are not attacking the entire system; you are attacking a critical component of the system that is vulnerable to attack in order to "de-link" the system from fully functioning. Figure 6-10 presents the CV for our example.

War Against Terrorism, Post-9/11
Enemy COG Analysis

CV (Noun!)

- Bases need host nations upon which military, diplomatic, and economic pressure can be mounted.
- Resolution of the Arab-Israeli conflict will remove the most potent cause for recruitment.
- Most Muslims worldwide are moderate; the isolation of extremists in most societies would limit the spread of the message.
- Charismatic leaders can be found and removed from influence, although care should be taken to avoid martyrdom.
- Worldwide financial network and movement of money can now be monitored through advanced IT, potentially identifying terrorist groups' sources of funds.
- Limiting flow of "know-how" to developing nations will make leaking technology and material to terrorist groups more difficult.

Figure 6-10

An additional step that is useful at this point is to conduct a crosswalk between the CR and the CV. The crosswalk shows the

planner and commander in a visual way how attacking a CV directly impacts the CR for the enemy and helps to focus efforts. This crosswalk does not use the CW construct. That step was necessary to determine and refine the CV, but it is not necessary to show the linkage between CR and CV. From an effects-based operations perspective, this crosswalk shows how attacking a CV achieves the effects on a CR. An example of the crosswalk is shown in Figure 6-11.

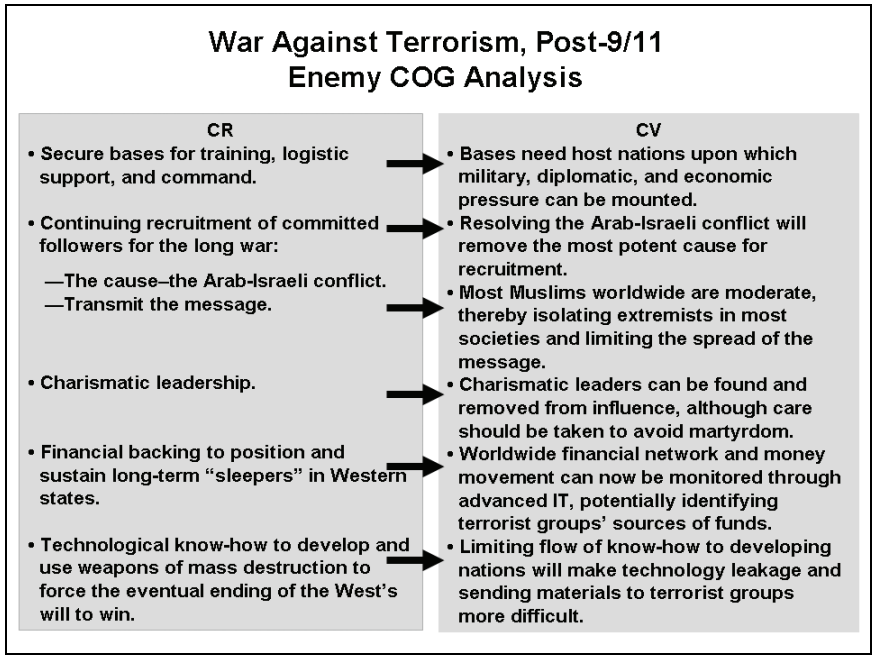


Figure 6-11 Enemy CR/CV crosswalk

At this point the planner has a clear linkage that ties together the CV that will be targeted to the COG—attack a CV to affect the CR that in turn affects the CC that in turn affects the COG that produces the desired effects.

Let me now shift gears and present the analysis from a friendly perspective. This process is similar to the process for the enemy analysis but is important in terms of assessing possible enemy actions. The friendly analysis is also important because the planner needs to look at the same considerations from a friendly perspective to protect CR and to prevent friendly vulnerabilities from being exploited.

War Against Terrorism, Post-9/11
Friendly COG Analysis

COG

Former President George W. Bush and the determination of the American people.

CC

To lead a concerted and sustained campaign to defeat extremist Middle Eastern terrorist groups.

Figure 6-12

Figure 6-12 shows the COG as the President of the United States and the determination of the American people, as discussed earlier. The CC for the president in the war on terrorism is "to lead a concerted and sustained campaign to defeat the extremist Middle Eastern terrorist groups," focusing on al-Qaeda and Associated Movements. To be able to achieve this CC, there are a number of inherent CR that must be acquired and protected. Figure 6-13 shows the CR to achieve the CC to lead a concerted and sustained campaign.

War Against Terrorism, Post-9/11
Friendly COG Analysis

CR

- Committed support of the US population (and therefore Congress) for the long war.
- Excellent intelligence on terrorist groups, organizations, personalities, and intentions.
- Bases in the Middle East and Central Asia from which military and other operations can be mounted.
- Worldwide support for US actions to give legitimacy to any military action, increase diplomatic pressure on host states, and ensure international application of antiterror measures.
- A temper, mood, or mind-set of the Middle East "street" that does not result in active or passive support to terrorists, insurgents, and enemies of the United States.

Figure 6-13

There are, of course, inherent weaknesses from a friendly perspective in the war on terrorism. Identifying these weaknesses requires some critical reasoning—thinking through the problem not only from friendly eyes but also from how the enemy considers us as weak. This is not an easy task but nonetheless necessary. Figure 6-14 provides a blunt assessment of some of the inherent weaknesses of friendly forces in the post-9/11 war on terrorism, especially for the United States.

War Against Terrorism, Post-9/11
Friendly COG Analysis

CW

- Requires resolve for the long term with fickle populations.
- Lack of unanimity in the world political arena.
- Perceived history of "cut and run" in Vietnam, Lebanon, Somalia.
- Religious tension—concept of a "crusade."
- Instantaneous press coverage of everything.
- Requirement to fight fair, even when the enemy does not.
- "Cold War" mind-set and military organization.
- Lack of coherent coordination between diplomatic, informational, military, and economic (DIME) elements.
- Personality dependent, particularly with allies.

Figure 6-14

These CW can translate into a number of CV for the United States and its allies. This is particularly true when the enemy does not fight fair and is fighting not only a fight in theater but also in the "living rooms of America" as we saw in Vietnam. Figure 6-15 provides an expanded list of the possible friendly critical vulnerabilities for the Post-9/11 War on Terrorism.

War Against Terrorism, Post-9/11
Friendly COG Analysis

CV

- Possible loss of interest if lack of observable activity over a long period.
- Possible reaction against campaign if mass casualties mount over time.
- Lack of human intelligence (HUMINT) within terrorist organizations; shortcomings of technical intelligence in this form of conflict.
- Depends on support of Russia and Islamic states that are vulnerable to criticism of US pro-Israeli bias.
- Such support may ebb in the long term as narrow national interests begin to reemerge.
- Perception that the United States cannot win.
- Perception of a "quagmire" or restlessness because of US inability to exert some measure of success.
- Perception of US pro-Israeli bias that will remain long after the Americans are gone.
- Perception that the US tendency is to quit and leave when things go sour (as in Vietnam, Lebanon, Somalia).
- Perception that the motive behind US actions is a renewed Christian "crusade" against Islam.

Figure 6-15

Figures 6-16 and 6-17 show the friendly crosswalk CR/CV.

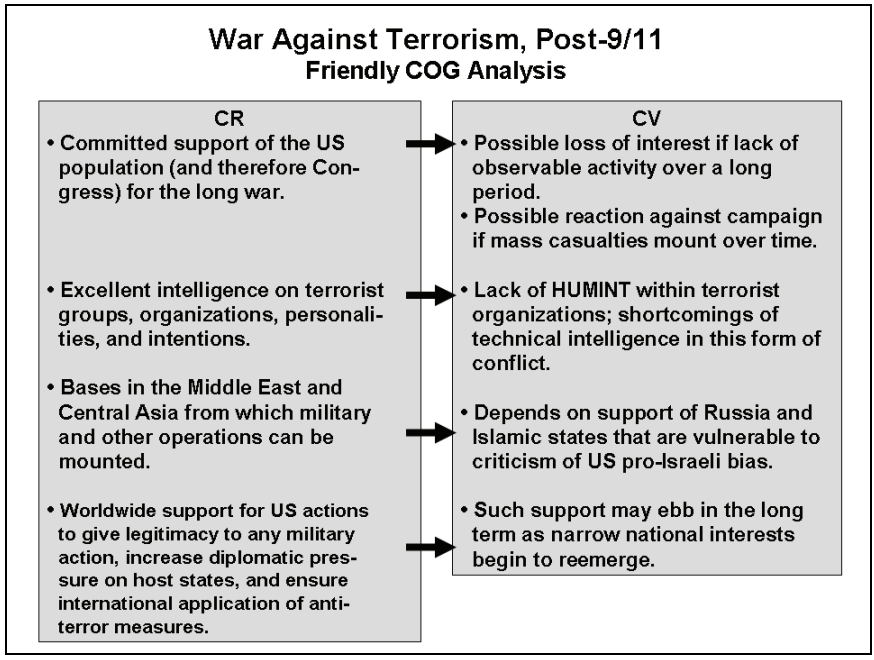


Figure 6-16

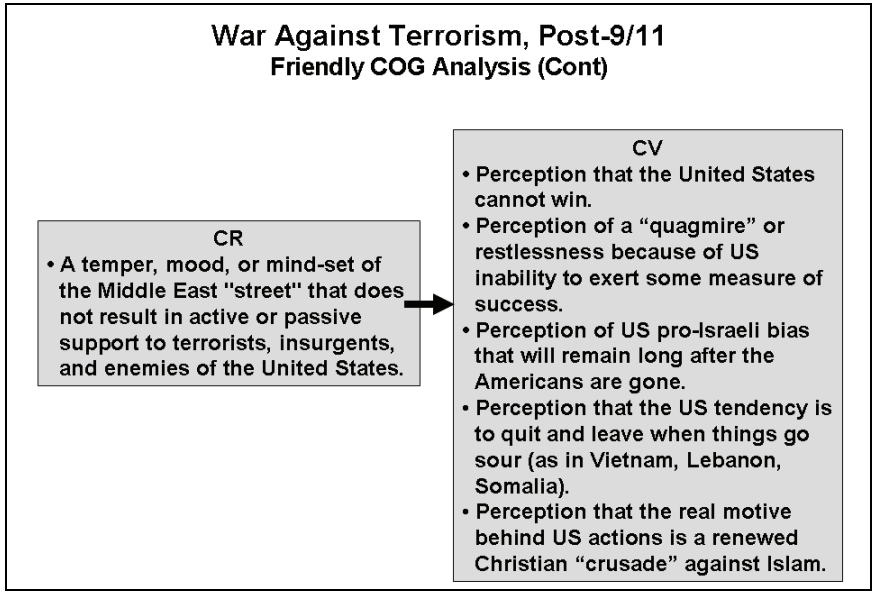


Figure 6-17

Let's look at the relationship between the concepts of CV, CR, CC, and the COG. Conceptually, the planner wants to attack the COG, but normally the COG, as the **primary** component of physical or moral strength, power, and resistance, is the most difficult to attack. The CV construct allows the planner to analyze and determine how to effectively plan to attack vulnerabilities that give the "biggest bang for the buck" in affecting the COG.

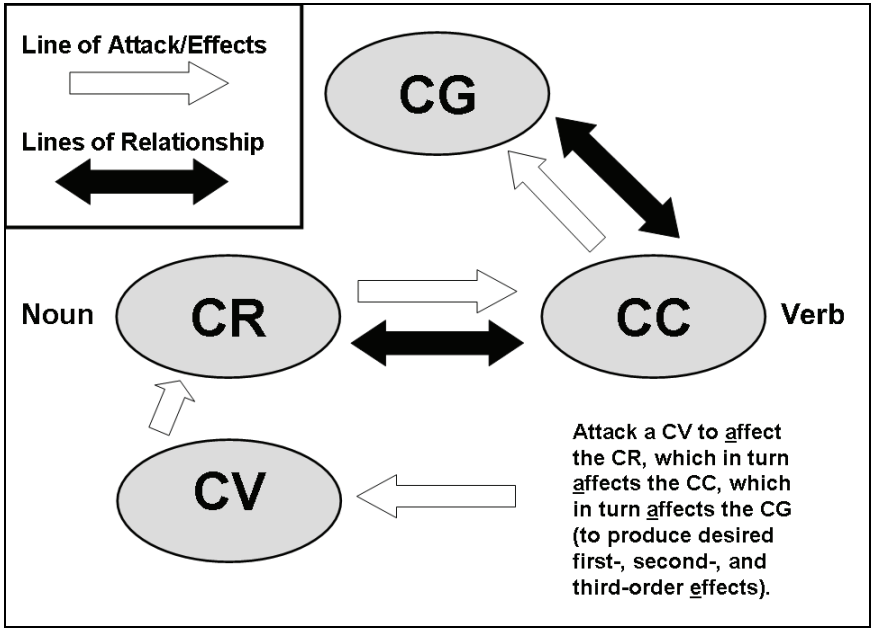


Figure 6-18 CV construct

Planners should plan to attack a CV to affect the CR—the process shown on the crosswalk figures earlier in this chapter. The **effects** on the CR **affect** the enemy's ability to achieve a CC that, in turn, affects the COG and prevents the enemy from achieving his desired end state. Figure 6-18 depicts the process of the CV construct. Figure 6-19 shows a simplified version of the CV construct with the linkage to the end state.

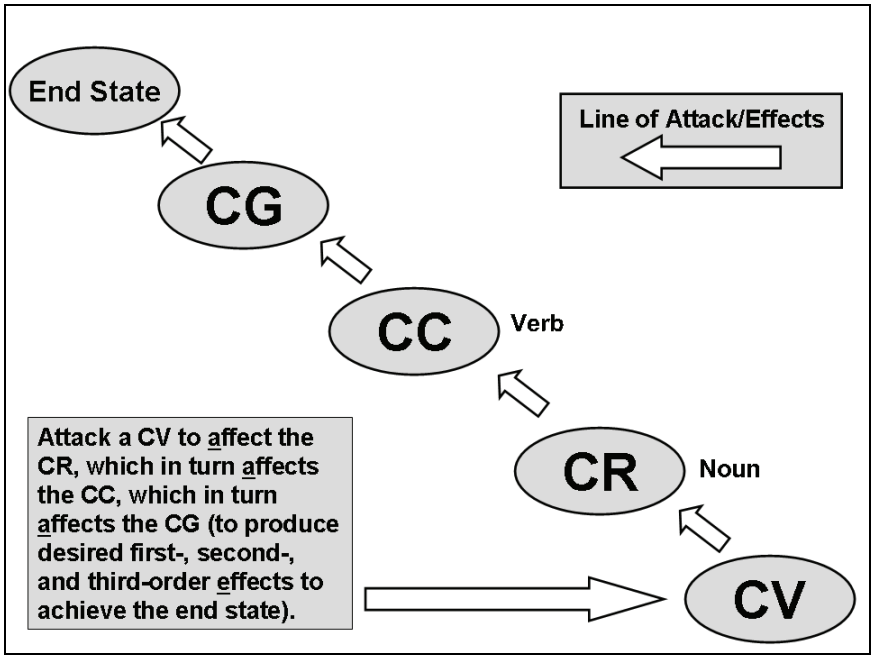


Figure 6-19 CV construct simplified

This construct has an additional advantage when thinking of the construct of ends, ways, and means. In chapter two I discussed the relationship of ends, ways, and means for campaign planning. That construct includes three components: determining the ends (the purpose for the COA), determining the ways (the methods, or how you will achieve the ends), and determining the means (the resources available to achieve the ways). Using the ends-ways-means methodology helps provide a coherent targeting methodology that links actions in the campaign to the purpose for the campaign.

The end state is, of course, the **ends**. Critical capabilities (CC) (expressed in verb form) provide insight into the **ways**. Critical requirements (CR) and Critical vulnerabilities (CV) (expressed as nouns) provide insight into the **means**. Figure 6-20 provides a graphic depiction of this conceptual framework.

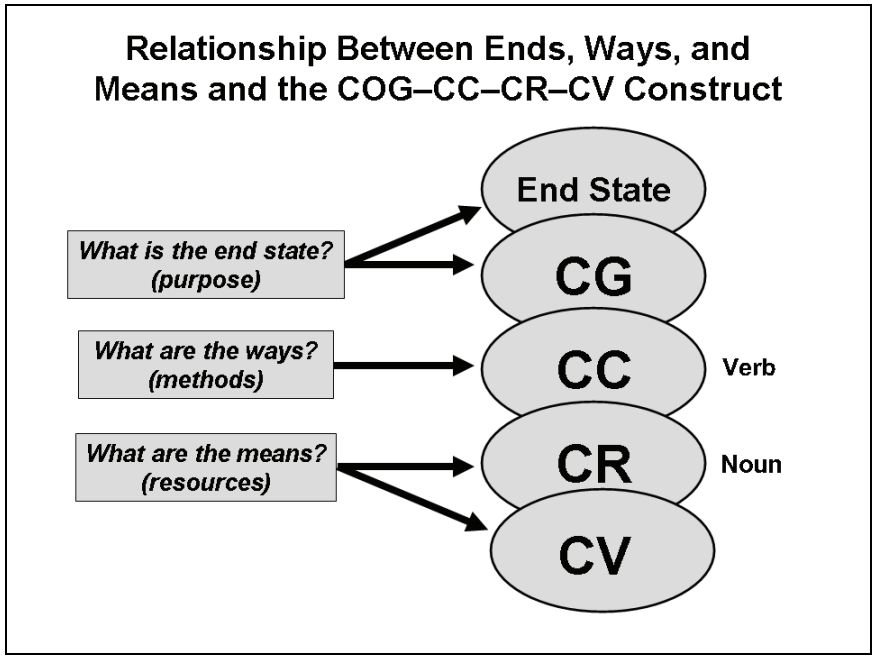


Figure 6-20

Bottom line. The CV construct provides a methodology by which to link targeting to the COG and the end state. Translating the COG into CV provides a useful tool for the planner to use to visualize the campaign using a systems approach.

Notes

1. For chapter six, the concepts of Dr. Strange are drawn from his monograph. See Dr. Joe Strange, *Centers of Gravity and Critical Vulnerabilities: Building on the Clausewitzian Foundation So That We Can All Speak the Same Language*, Marine Corps University Perspectives on Warfighting Number Four, Second Edition (Quantico, VA: Marine Corps University Foundation, 1996).

2. Ibid., 43. See also JP 5-0, IV-11.

3. Ibid.

4. Strange, 74.

Chapter Seven

Targeting: Target Value Analysis

The previous chapter addressed the CV construct Dr. Strange developed at the USMC War College. This chapter will address and compare other targeting methodologies as additional tools for campaign planners, focusing on target value analysis (TVA).

Target Value Analysis

TVA links the effects of attacking a target directly to the targeting function and involves detailed analysis of enemy doctrine, tactics, equipment, organization, and expected behavior. TVA listings indicate which targets are important, which are vulnerable, and when and where they are likely to be most vulnerable.

Through TVA the staff identifies those assets that the enemy commander requires to successfully complete the mission. These are identified as high-value targets (HVTs). Because these targets are key to the enemy commander's success, they are normally given a higher priority for attack.

If an HVT can be successfully acquired, is vulnerable to attack, and if such an attack supports the friendly scheme of maneuver, the target may be nominated as a high-payoff target (HPT).

Figure 7-1

Simply put, there are two primary steps in TVA. The first step is developing the high-value targets (HVTs)—targets that are "key to the enemy commander's success," seen from the enemy's perspective. The G2/J2 is primarily responsible developing the high-value target list (HVTL).

The second step is to develop the high payoff target list (HPTL). These targets are derived from the HVTL, but the target is not only important from the enemy's perspective. The HPTL is also important from the friendly commander's perspective (supports his scheme of maneuver), can be acquired, and can be attacked. Simply put, a target on the HPTL is a target the enemy commander needs and the friendly commander **can** and **wants** to attack.

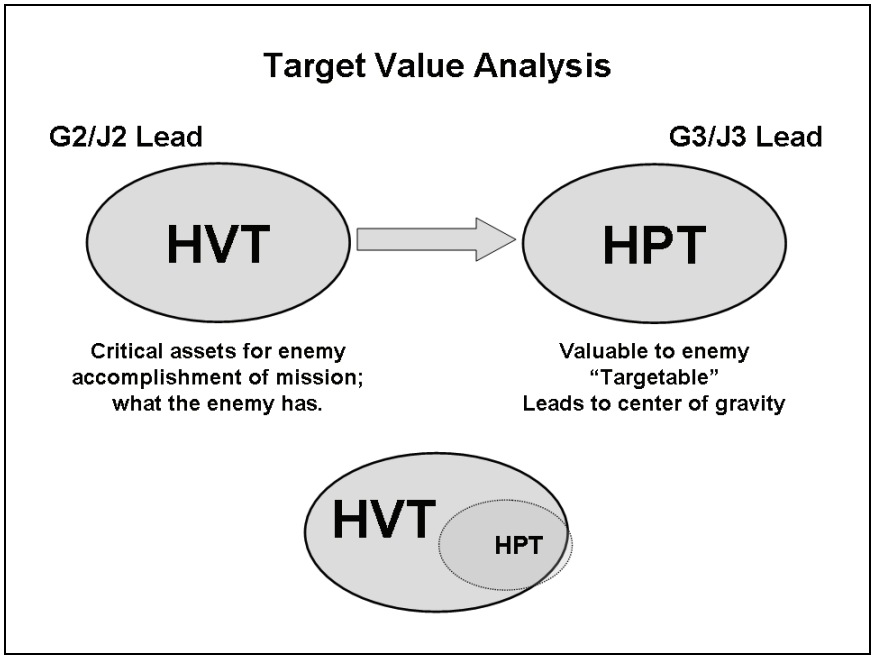


Figure 7-2 TVA process

Figure 7-2 provides a graphic depiction of the TVA process. Note that at the bottom of the figure the HPTL is a subset of the HVTL. Of course, there normally will be more targets that are identified than can be targeted or should be targeted. An HPT is normally already an HVT with the additional steps of the friendly commander wanting and being able to attack the target to achieve his objectives. In recognition that there may be some targets the enemy commander may not even realize are of great

value to him but are of value to the friendly commander, the HPTL subset circle goes somewhat beyond the boundaries of the HVTL. An example of this could be a one-of-a-kind system such as a telephone switching system. Eliminating the telephone switching system could support the friendly scheme of maneuver but seemingly be of no real value to the enemy commander.

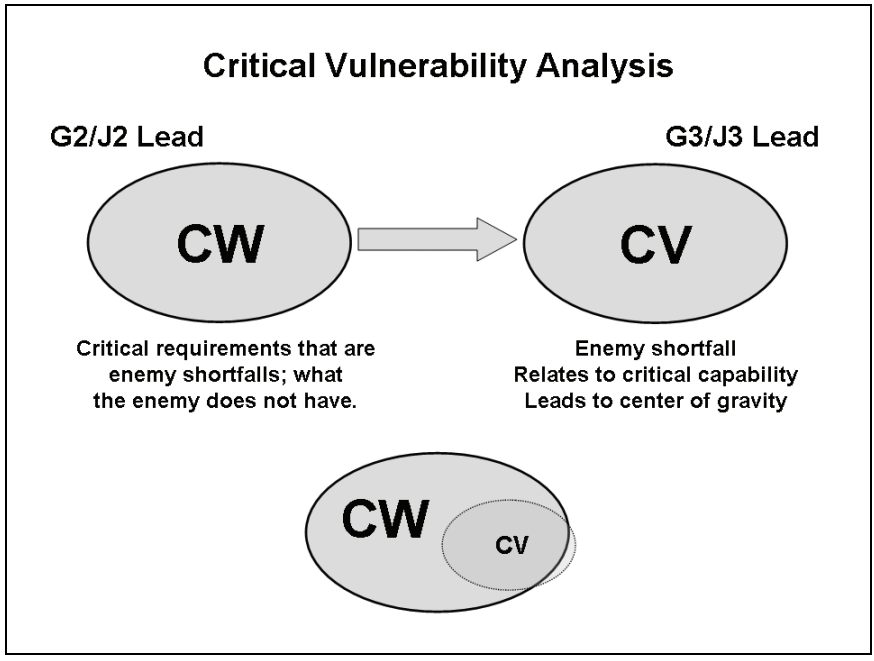


Figure 7-3

There is a similar process for CVA (Strange's methodology) that is shown in Figure 7-3. Two of the steps in CVA include developing CW and CR that are deficient or lacking for the enemy. The G2/J2 should have the primary responsibility for identifying the CW. CV are derived from the CW—those CW that contribute significantly to achieving a CC, are vulnerable to attack, and are "targetable" by the friendly commander. Again, there may be rare situations in which a CV is not identified as a CW. The G3/J3 should be responsible for developing the CV.

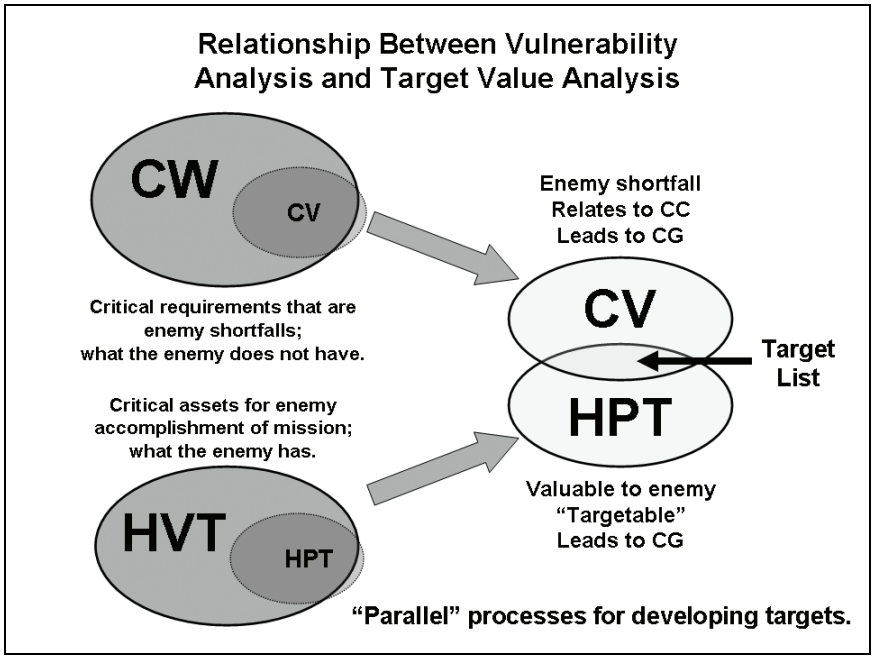


Figure 7-4

Figure 7-4 depicts the relationship between TVA and Strange's CVA. Although the processes for TVA and CVA are similar, they are not the same. Some military theorists contend that "Strange's concept is that he provides a systematic method for translating the often-nebulous concept of the COG into meaningful military tasks. Yet, in a way, this is a high-value/high-payoff target approach to operational planning."[1]

The approach may have similarities, but there are distinct differences. TVA approaches targeting from **what the enemy has** while Strange's CVA approaches targeting from **what the enemy does not have and needs**. Both methods are important to use for targeting. Both have value; each of the methods approaches the targeting problem from a different perspective.

John Warden's Five Rings

An additional targeting approach that I think is of use is based on the writing of Colonel John Warden, US Air Force. As an airpower theorist, Warden's approach is a systems approach to targeting based on being able to attack a number of targets simultaneously. Figure 7-5 shows his systems framework of the five systems in a society that should be considered for attack.[2]

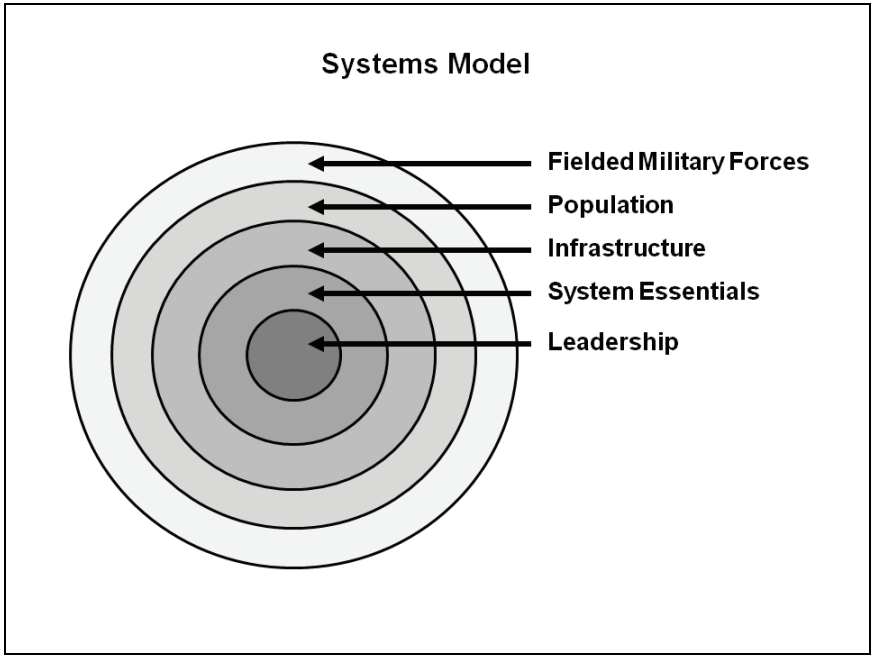


Figure 7-5 Warden's rings

The systems framework of Warden's model is designed to indicate that targets closer to the center of the concentric circles are closer to the COG. Warden's model is consistent if the COG at the strategic level is the leader. Each of these systems provides a source of power for the COG; targeting these systems can be accomplished by using lethal or nonlethal means. Warden expanded his explanation of system attributes to systems other than a nation state, as shown in Figure 7-6.[3]

System Attributes

	Body	State	Drug Cartel	Electric Company
Leader	Brain -eyes -nerves	Government -communication -security	Leader -communication -security	Central control
Organic Essential	Food/oxygen -conversion via vital organs	Energy (electricity, oil, food), money	Coca source plus conversion	Input (heat, hydro) Output (electricity)
Infrastructure	Vessels, bones, muscles	Roads, airfields, factories	Roads, airways, sea lanes	Transmission lines
Population	Cells	People	Growers, distributors, processors	Workers
Fighting Mechanism	Leukocytes	Military, police, firemen	Street soldiers	Repairmen

Figure 7-6

Comparison of System Approaches

General Frank's Slices

Leadership
Internal security/regime intelligence
WMD infrastructure/R&D
Republican Guard/ Special RG forces
Selected Regular Army forces
Territory (S, N, W)
Infrastructure
Civilian population
Commercial and diplomatic leverage

Colonel Warden's Rings

Leadership
System essentials
Infrastructure
Population
Fielded military forces

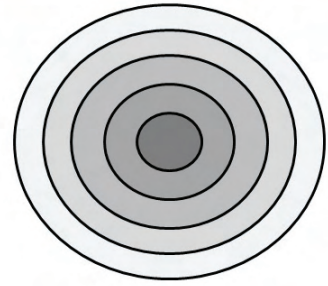


Figure 7-7

It is interesting to see the parallel between the five different systems in Warden's targeting methodology and the concept of "slices" by General Franks in OIF. Figure 7-7 shows the slices and the systems side by side for comparison.

Bottom line. TVA and CVA are similar but approach the targeting problem from two different perspectives. TVA approaches targeting from what the enemy has; CVA approaches targeting from enemy deficiencies. Warden's systems framework provides another useful methodology for approaching targeting.

Notes

1. Colonel James K. Greer, “Operational Art for the Objective Force,” *Military Review* (September-October 2002), 29.

2. Colonel John Warden, “Air Theory for the Twenty-First Century,” *Battlefield of the Future: 21st Century Warfare Issues*, revised edition, Barry R. Schneider and Lawrence E. Grinter, eds. (Maxwell Air Force Base, AL: Air University Press, 1998), 108.

3. Ibid., 107.

Chapter Eight

Course of Action Analysis—Wargaming

Once you have pulled it all together and developed the tools from the earlier chapters for campaign planning, it is imperative to go through the process of course of action (COA) analysis or, as it is better known, to wargame that COA. This chapter provides guidance for wargaming a COA and sets the stage for conducting a rehearsal at the operational level.

No one has the magic answer for conducting a COA analysis or wargaming at the operational or campaign level, so the description in this chapter is **a** way rather than **the** way to conduct a wargame. The basic instrument for wargaming, as described in this chapter, is a COA that has been developed and clearly identifies end state; strategic and operational COGs (or DPs at the tactical level); a defined defeat and/or stability mechanism; and logical lines of operation to retain a focus on all activities within the area of operation and ensures that targeting is linked to the COG and end state (using either the critical vulnerability construct or TVA, or better yet – a combination of the two). With these components present within your COA, you can now move forward and conduct a solid wargame that considers the entire campaign area of operations. Most important, you can link specific activities and objectives to the end state. The wargaming process answers the question in Figure 1-1 and Figure 2-1—"Does the solution answer the problem?"

COA analysis, or wargaming, is described in Joint doctrine as "a means for the commander and participants to analyze a tentative COA, improve their understanding of the operational environment, and obtain insights that otherwise might not have occurred."[1] Joint doctrine also describes wargaming as "a conscious attempt to visualize the flow of the operation, given joint force strength and dispositions, adversary capabilities and possible COAs, the OA [operational area], and other aspects of the

operational environment."[2] Joint doctrine also identifies some sample steps to prepare for a wargame[3]:

Wargaming Steps - Joint

- Gather tools
- List and review friendly forces
- List and review enemy forces
- List known critical events
- Determine participants
- Determine enemy course of action (COA) to oppose
- Select wargaming method
  - Manual or computer assisted
- Select a method to record & display wargaming results
  - Narrative
  - Sketch & note
  - Wargame worksheets
  - Synchronization matrix

Figure 8-1

Army doctrine provides a similar list for the preparation and conduct of a wargame[4]:

Wargaming Steps - Army

- Gather the tools.
- List friendly forces.
- List assumptions.
- List known critical events and decision points.
- Determine evaluation criteria.
- Select the wargame method.
- Select a method to record and display results.
- Wargame the battle and assess the results.

Figure 8-2

Note that Army doctrine lists some important additional steps for wargaming – such as listing assumptions and determining evaluation criteria; Joint doctrine lists the additional step of listing and reviewing enemy forces. Here's a proposed modified list that combines the elements of both lists for the preparation of a wargame:

Wargaming Steps - Combined

- Gather the tools
- List and review friendly forces
- List and review adversary forces
- List assumptions.
- List known critical events and decision points
- List evaluation criteria
- Determine participants
- Determine adversary courses of action (COA)
  - Adversary Most Likely COA (MLCOA)
  - Adversary Most Dangerous COA (MDCOA)
- Select wargaming method
  - Manual or computer assisted
- Select a method to record & display wargaming results
  - Narrative
  - Sketch & note
  - Wargame worksheets
  - Synchronization matrix

Figure 8-3

Let's review each of these steps in terms of conducting a wargame at the operational level.

Gather the tools. Tools include staff estimates, results of intelligence preparation of the battlefield, a working COA (based on logical lines of operation), COG analysis (including the crosswalk of CR and CV), defined objectives and decision points,

maps, and everything else you have from mission analysis. The process of gathering the tools continues throughout the preparation for the wargame – you'll also need the problem statement, your restated mission, assumptions, evaluation criteria, and all the other previously developed products for "eye candy" to display to keep focused during the wargaming process. This "eye candy" display should be the same for the friendly forces as for adversary forces.

List and review friendly forces. Ensure that you do not just consider those forces on your annex A (troop list) but that you also consider those organizations and entities in the theater that can influence your actions. This includes, but is not limited to, NGOs, PVOs, OGAs, friendly units not under your control, the friendly population, etc. It is also useful to consider those "gray" organizations that are in the theater that may not even cooperate directly with you because of their policies or culture (such as Doctors Without Borders / *Médecins Sans Frontières*) but may be of help. This is particularly true when considering the myriad of organizations that will conduct humanitarian assistance activities in a theater but want nothing to do with the military. Their actions will have an impact—identify them at this step. You may even want to consider going beyond a "two-way" wargame and develop LLOOs for key players, such as the host nation – it is quite possible that these players have different objectives, logical lines of operations, and a different end state. This, no doubt, makes the wargame process more difficult – but also more realistic.

List and review adversary forces. Just as with friendly forces, ensure that you do not just consider those forces that you have identified as available to the adversary but that you also consider those organizations and entities available to the adversary in theater that can contribute to the adversary's COA. This includes, but is not limited to, affiliated forces such as criminal elements, insurgent organizations, sympathizers, and the like. Some of the "gray" organizations in theater may also – wittingly or unwittingly

– contribute to the adversary's COA. Keep all of these elements in mind when listing and reviewing adversary forces.

List assumptions. These need to be evaluated for validity (are they assumed to be true?) and necessity (does the plan really hinge on this?). When considering and listing assumptions, use the logical lines of operation that you have developed as a cross-check to ensure you have covered everything. For example, if you have a logical line of operation for information operations, which I believe you should have for every campaign, have you assumed that you will be able to get your message to the local populace to "stay put" through the local media?

List evaluation criteria. This is a tough one to do; the evaluation criteria should be determined before developing courses of action based on the initial commander's guidance. When will you know if you have succeeded? It is dangerous to think only in terms of an exit strategy for campaign planning. Remember, for campaigns you not only want to win the battle, you also want to set the conditions for winning the war and winning the peace for the long term. The evaluation criteria for success are tied to achieving the end state. For each of the logical lines of operation you should have developed measures of performance and measures of effectiveness (more on these in the next chapter), but it is the cumulative effect of all the logical lines of operation that achieve the end state.

There are, of course, a number of additional concerns that should be addressed when identifying evaluation criteria. The number of casualties will always be a concern, as will the amount of time it takes to achieve the end state. Additionally, strategic guidance and intent will always be a concern.

There is a tendency, especially among Army officers, to use a laundry list, such as the principles of war or the feasible, acceptable, suitable, distinguishable, and complete (FASDC) test for the evaluation criteria. Of course, during the development of a

COA the principles of war should be considered. Using FASDC is a mistake – FASDC is the screening criteria, not evaluation criteria; every COA must meet the FASDC test or it's not a valid COA!

Evaluation Criteria: Perseverance

Perseverance: To ensure the commitment necessary to attain the strategic end state. Commanders prepare for measured, protracted military operations in pursuit of the desired Coalition strategic end state. Some multinational operations may require years to reach the desired end state. The patient, resolute, and persistent pursuit of coalition goals and objectives often is a requirement for success.

Less than desirable: The COA involves operations which fail to demonstrate unity of effort, or those that degrade legitimacy (indirectly affecting perseverance)

Desirable: The COA fosters commitment within the Coalition and its international and Host Nation partners while preserving the Coalition and Host Nation Security forces/assets over time.

Optimal: The COA demonstrates unity of effort and coalition will by presenting an opportunity to fortify what our enemies assume is our primary vulnerability; convincing the population and our partners that we intend to stay the course.

Figure 8-4

It is important to remember that the process of "comparison of courses of action" starts by comparing a COA against the evaluation criteria – not comparing courses of action against each other… Joint doctrine states:

"COA comparison is an objective process whereby COAs are **considered independently** of each other and **evaluated / compared against a set of criteria** that are established by the staff and commander. The goal is to identify the strengths and weaknesses of COAs so that a COA with the highest probability of success can be selected or developed. The commander and staff develop and evaluate a list of important criteria, or governing factors, consider each COA's advantages and disadvantages, identify actions to overcome disadvantages, make final tests for feasibility and acceptability and weigh the relative merits of each."[5]

A solid approach to evaluation criteria would be to use the additional principles of joint operations for three of the criteria – these are legitimacy, perseverance, and restraint.[7] Use a total of no more than 5-6 criteria, and establish a working definition of the terms prior to conducting the wargame.

For example, if you chose "perseverance" as one of the elements of your evaluation criteria, the working definition of the term (derived from JP 3-0) and a "rubric" for evaluation could be as shown in Figure 8-4:

List known critical events and decision points. If you have done your homework on developing the logical lines of operation by developing objectives and decision points, you are ahead of the game. At the operational level, it is also important to think of critical events beyond what you have planned in the logical lines of operation. Are there significant local religious holidays during the conduct of the campaign? Are elections taking place? Are there any particular anniversaries of critical events occurring during the campaign? Think of critical events not only geographically but also chronologically.

Determine participants. This is an essential step because everyone is important during wargaming. As JP 5-0 states, "the most important element of wargaming is not the tool used, but

the people who participate."[6] At a minimum, those participating in the wargame must have detailed knowledge of the COA. There should be a dedicated red cell that can aggressively pursue the adversary's point of view; this red cell should have also developed the adversary's COAs and supporting red cell staff products (LLOO chart, adversary assumptions, etc.). The recorder is also a key member of the wargaming team, carefully capturing the results of the wargame – these products will be essential in the COA analysis and during further development of the COA after COA selection.

There is also a requirement to have someone play the role of the umpire – in a competitive wargame, there is a need to have someone dedicated to do adjudication so the wargame can continue. The umpire must be objective to ensure the results are meaningful. This shouldn't be the recorder – the recorder has enough to do! The umpire should also be the timekeeper – limit the times allowed for each turn so the game moves along, giving the same amount of time to each side.

When using the construct of logical lines of operation, it is also essential to have a proponent assigned for every logical line of operation. This staff officer has the responsibility to consider the actions that take place along that logical line of operation during every game turn and to consider the impact of the actions in the other logical lines of operation. For example, if the initial main effort is establishing a hasty defense during the campaign, the staff focuses on each action that takes place to prepare for that defense. The staff judge advocate may be responsible for the "promotion of democracy" logical line of operation. At every game turn, the staff judge advocate will consider the actions taking place in the democracy logical line as well as the impact of the hasty defense line (and the information operations line, and the humanitarian assistance line, etc.). This is an essential element of wargaming with logical lines of action – forcing the staff to look at the second and third order effects for every action.

The process – having "LLOO proponents" – will most likely reveal that some actions will have a positive effect on one line while having a negative effect on another line. Using the example above, it may be useful for maneuver units to establish hasty defensive positions using obstacles, but that could have a negative effect on humanitarian operations and information operations with the local populace. At this point, it may be necessary to determine if there are ways to mitigate the conflict between the two logical lines of operation or to determine an alternate approach. When this dilemma (positive effects on one line with negative effects on another line) is identified, this forces the commander to either accept risk with the negative effects or to make modifications to mitigate the negative effects. More on this later.

Determine adversary courses of action (COA). Similar to friendly COA development, adversary COAs should be prepared using adversary logical lines of operation that lead to the adversary's proposed end state. The most likely COA would be the way the adversary prefers to fight in each of his own logical lines of operation and should also be tied to an adversary end state. The most dangerous COA should be that COA that causes you, as the friendly commander, the greatest concern—those actions the adversary can accomplish that keep you awake at night (and are directly related to the adversary's critical capabilities). This process also ensures that all of the adversary actions are purposeful activities that lead to his end state.

A note of caution here. If you have limited time, it is **more important to wargame more than one adversary COA** (most likely and most dangerous at a minimum) than it is to wargame more than one friendly COA. If you wargame one solid friendly COA against the two adversary COAs with some success, you have a pretty good idea that your COA will work regardless of what the adversary throws at you. If, on the other hand, you wargame multiple friendly COAs against just one adversary COA, you are

assuming that the adversary will do exactly what you want him to do, and you will likely be surprised.

*** Additional courses of action.** In the real world, it may not be as simple as having two "players" in the operational environment; there will no doubt be a host nation, there may be "fence-sitters", and other potential actors in the operational area. You may want to consider going beyond a "two-way" wargame and develop LLOOs for key players, such as the host nation (a "green cell"). It is quite possible that these players have different objectives, logical lines of operations, and different end states. This, no doubt, makes the wargame process more difficult when you do a "three way" (or more) wargame – but this is also more realistic.

Select the wargame method. The three wargame methods in Army doctrine are the belt, avenue-in-depth, and box methods.[8] All three methods are oriented on terrain, which does not work well if you focus on logical lines of operation that happen all over the operational area. For this reason, I recommend that you use a modified box method. The modification is that the box you use is always focused on the main effort during a critical event—that effort at a time and space that receives the primary focus of support and attention. Army doctrine describes this method as one that "is particularly useful when planning operations in noncontiguous areas of operation" that "isolates an area and focuses on critical events in it."[9]

Here is the big difference when using the modified box method for campaign planning: when conducting the wargame, the staff will isolate the box and focus on critical events, **but it will also consider at every action, or "game turn," the simultaneous actions that take place along each of the logical lines of operation.**

To make this work, as mentioned before, a staff proponent must be assigned as the "LLOO proponent" for every logical line of operation. For wargaming, this staff officer has the responsibility

to consider the actions that take place along that logical line of operation during every game turn and to consider the impact of the actions in the other logical lines of operation.

The method for conducting the wargame should also be clearly understood by all of the participants. For each critical event, the first "move" should be made by the player with the initiative; generally, this should be friendly forces since the wargame is evaluating the friendly course of action (although there are exceptions; for an attack across the border with friendly forces in the defense, the initiative would be for the adversary crossing the border).

At the beginning of every turn, it is important to ensure that the starting conditions are fully understood – the turn should begin with a statement of the current situation, using the elements of a COA from Figure 4-8: Task organization, scheme of maneuver, main effort, defeat and/or stability mechanisms, and the anticipated use of reserves. This methodology gives the "summary update" of the forces at the start of the critical event. Both friendly and adversary forces should use this same construct to provide situation awareness at the beginning of each turn (as well as any "third player").

After providing the starting conditions, the first player outlines actions in the modified box by stating moves using Asset – Task – Purpose; this methodology helps the recorder to capture the actions and ensures that all assets are considered – and will provide the basis for the "tasks to subordinate units" in the written plan. When describing moves in terms of Asset – Task – Purpose, the "purpose" for the main effort during the critical event should match the defeat and/or stability mechanism to ensure coherence to the plan. All moves should contribute to achieving the conditions listed in the end state.

After providing task and purpose for each asset, the "LLOO managers" should provide their assessment of the effects of the

moves along their logical lines of operation. This ensures that second and third order effects are considered, and has the additional benefit of considering the effects of moves throughout the area of operation – looking beyond the modified box. LLOO considerations should also be captured by the recorder; these will frequently become included in the coordinating instructions for the written plan. LLOO considerations may also capture any potential branches to the plan; since the wargame focuses on sequels, LLOO considerations help to identify branches that may require additional contingency plans.

At the conclusion of the turn, there should be another statement of the ending conditions – again, using the same elements of a COA: task organization, scheme of maneuver, main effort, defeat and/or stability mechanism, and the anticipated use of reserves. This provides the "summary update" of the forces at the end of each turn.

At this point, the turn is over for the first player. The second player does an identical process:

Wargame "Turn" Process

1. Starting "Summary update" (TO, SM, ME, D/SM, Reserves)
2. Asset / Task / Purpose move of all forces
3. LLOO Considerations
4. Ending "Summary update" (TO, SM, ME, D/SM, Reserves)

Figure 8-5

The turns continue until the critical event comes to a conclusion or until a new critical event begins – each of the "turns" should represent a specific time frame and should allow

time for each of the sides to have multiple turns as the critical event unfolds.

This process is admittedly different than the "action – reaction – counteraction" cycles in FM 5-0 and JP 5-0. FM 5-0 provides the following description:[10]

> *Actions* are those events initiated by the side with the initiative (normally the force on the offensive). *Reactions* are the other side's actions in response. *Counteractions* are the first side's responses to reactions. This sequence of action-reaction-counteraction is continued until the critical event is completed or until the commander determines that he must use another COA to accomplish the mission.

This process seems inherently unfair… the initiator gets two moves whereas the other side just gets one turn! In a simulation, both sides input their moves at the same time – and then the computer "runs" the game and spits out the results; a one-for-one process. In the real world, time doesn't stop for either side – and both have the same opportunity to act, react, and counteract on the fly.

This is also a problematic approach when conducting a "three way" wargame – who gets the last turn in the act-react-counteract cycle?

In the modified approach described in this chapter, the first turn is the "act" – and all subsequent turns incorporate the processes of acting, reacting, and counteracting. In this way, each side has to "wrestle the initiative" from the other.

Select a method to record and display results. Using a synchronization matrix across time and space and using logical lines of operation as a guide provides the best mechanism for capturing the results of the wargame. The results of the wargame should clearly identify those activities that have positive and negative effects for different lines of operation. If all of the

players follow the guidelines of providing the "thumbnail update" of task organization, scheme of maneuver, main effort, defeat/stability mechanism, and the anticipated use of reserves – and use asset / task / purpose to define moves, it will be much easier for the recorders to capture the wargame. In addition, the "LLOO managers" need to be explicit when describing the effects on their LLOOs, and the results of adjudication need to be clearly stated.

Wargame the battle and assess the results. Of course, in this step you are wargaming the entire campaign, not the battle, albeit one critical event at a time. The players needed for the wargame not only include the different proponents for each logical line of operation but also proponents for the enemy logical lines of operation. For campaign planning, it is essential that the enemy players represent only enemy actions during the wargame rather than have staff officers from the G2/J2 section who are dual-hatted as friendly and enemy players.

At the end of the wargame the commander and staff should be able to make the necessary modifications to the COA as well as identify the critical decisions the commander will have to make while executing the plan. A comprehensive list of all possible results from an effective wargame can be found in FM 5-0, pages 3-51 through 3-52.

The most important question of the wargame should be "does the solution answer the problem?" or specifically "does the COA get us to the end state?" If it does not, it may be time to go back to developing a COA that does accomplish the mission. The "eye candy" displays should help to retain this focus throughout the wargame. An effective wargame should also set the stage for rehearsing the selected COA using the same procedures—using a proponent for each of the logical lines of operation to represent the actions along their line during each step of the rehearsal to synchronize the COA.

Bottom line. Conducting a wargame of a COA at the operational level follows the same basic steps as a wargame at the tactical level:

- Gather the tools
- List and review friendly forces
- List and review adversary forces
- List assumptions.
- List known critical events and decision points
- List evaluation criteria
- Determine participants
- Determine adversary courses of action (COA)
- Select wargaming method
- Select a method to record & display wargaming results
- Wargame the battle and assess the results.

At the operational level, wargaming should use a modified box method with proponents for each of the logical lines of operation for both enemy and adversary actions. During each turn of the wargame, each proponent should identify actions along their line of operation as well as the effects of actions in other logical lines.

Notes

1. JP 5-0, III-31.
2. Ibid.
3. Ibid., III-32.
4. FM 5-0, paragraph 3-165.
5. JP 5-0, III-32—III-33.
6. Ibid., III-31
7. JP 3-0, A-3—A-5.
8. FM 5-0, paragraph 3-176.
9. Ibid., paragraph 3-176.
10. Ibid., paragraph 3-181.

Chapter Nine

Assessment: MOP and MOE

One of the most important concepts for campaign planning is to understand how to do assessment – determining if the solutions, or courses of action, address the problem. There are a number of different constructs for assessment, but the most useful is in understanding indicators, measures of performance (MOP), and measure of effectiveness (MOE).

The first concept, indicators, won't be discussed in great detail in this chapter; indicators are defined as "items of that are measurable, collectable, and relevant to give insight into a measure of effectiveness or measure of performance."[1] Examples of indicators are incidents of crime, reports of criminal activity, or survey data relating to attitudes. These examples do not necessarily provide MOP or MOE, but can be used to gain insight into MOP and MOE.

The key terms, Measures of Performance and Measures of Effectiveness, are defined in Joint Doctrine as shown below:[2]

MEASURE OF PERFORMANCE (MOP): A criterion used to assess friendly actions that is tied to measuring task accomplishment.

MEASURE OF EFFECTIVENESS (MOE): A criterion used to assess changes in system behavior, capability, or operational environment that is tied to measuring the attainment of an end state, achievement of an objective, or creation of an effect.

JP 5-0 also provides an explanatory chart that provides some clarity to the concepts of MOP and MOE. This chart helps to understand how these concepts interrelate:[3]

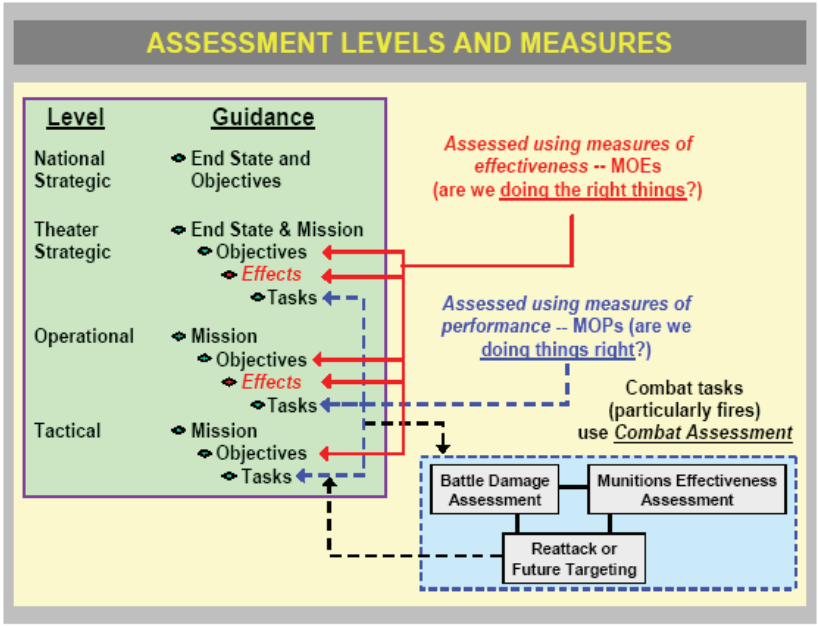


Figure III-17. Assessment Levels and Measures

Figure 9-1

It is important to note that the measures of performance – MOP – relate to the tasks being performed with the question "are we doing things right?" Measures of effectiveness – MOE – relate to the effects and objectives with the question "are we doing the right things?" JP 5-0 states that "MOPs are closely associated with task accomplishment" whereas MOEs "measure the attainment of an end state, achievement of an objective, or creation of an effect; they do not measure task performance."[4]

FM 3-0 provides a similar explanation of the terms MOP and MOE. FM 3-0 states that "measures of performance answer the question, 'Was the task or action performed as the commander intended?' A measure of performance confirms or denies that a task has been properly performed." For MOEs, FM 3-0 states "measures of effectiveness focus on the results or consequences of actions taken. They answer the question, 'Is the force doing the right things, or are additional or alternative actions required?' A

measure of effectiveness provides a benchmark against which the commander assesses progress toward accomplishing the mission." [5]

FM 3-07, *Stability Operations*, provides a more explicit definition of the concepts of MOP and MOE:

> **MOP:** A measure of performance is a criterion used to assess friendly actions that is tied to measuring task accomplishment (JP 3-0). At the most basic level, every Soldier assigned a task maintains a formal or informal checklist to track task completion. The items on that checklist are measures of performance. At battalion level and above, command posts monitor measures of performance for assigned tasks. Examples of measures of performance include the construction of a training facility for host-nation security forces or an increased border presence by friendly forces.[6]
>
> **MOE:** A measure of effectiveness is a criterion used to assess changes in system behavior, capability, or operational environment that is tied to measuring the attainment of an end state, achievement of an objective, or creation of an effect (JP 3-0). They focus on the results or consequences of task execution and provide information that guides decisions to take additional or alternate actions. Examples of measures of effectiveness include reduced insurgent activity, reduced inflation rates, and improvements in agricultural production. [7]

FM 3-07 also provides an excellent description and example of how indicators are used to assess MOPs and MOEs:

> **Indicator:** An indicator is an item of information that provides insight into a measure of effectiveness or measure of performance. Indicators use available information to inform a specific measure of performance

or measure of effectiveness. A single indicator can inform multiple measures of performance and measures of effectiveness. Valid indicators are measurable, collectable, and relevant to a specific time. Examples of indicators include bushels of apples sold in a specific market in the past month, number of escalation of force incidents along a given route in the past 90 days, and number of bridges repaired in a province.

One useful way to think of MOPs and MOEs is to think of them in terms of task and purpose; MOPs relate to accomplishment of the task, and MOEs relate to the accomplishment of the purpose. For example, a unit may be given the task and purpose of occupying a hill in order to provide early warning. The task of occupying the hill expertly executed; the accomplishment of this task provides a measure of performance. If the occupation of the hill does not provide early warning – or doesn't achieve the intended purpose for the occupation, this is reflected as in a measure of effectiveness.

Another example is that a unit may be tasked to conduct at least 10 patrols a day in a neighborhood in order to gain confidence of the local populace. Even though the unit might conduct the requisite number of patrols to standard, it still may not gain confidence. From an MOP standpoint, the unit is successful; from an MOE standpoint, it may not be. As a result, MOP could easily be considered more of a quantitative measure, while MOE tends to be a qualitative measure.

The focus for **MOP is primarily internal** – answering the question "are we doing what we are told to do?" **MOE may have an external focus** – answering the question "do our actions have the effect on others that we are expecting?

Figure 9-2 provides a comparison of the concepts of MOP and MOE and how they relate to task and purpose, quantitative vs.

qualitative measures, internal vs. external focus, and the primary questions to ask for each measure.

	MOP	MOE
Relationship to Task & Purpose	**Relates directly to Task**	**Relates directly to Purpose**
Quantitative vs. Qualitative Measures	**Primarily Quantitative**	**Primarily Qualitative**
Internal vs. External Focus	**Internal Focus (Task at hand)**	**External Focus (Impact of Actions)**
Primary Question	**Are we doing things right? (Are we accomplishing the task to standard?)**	**Are we doing the right things? (Are the things we are doing getting us to the end state we want?)**

Figure 9-2

The concepts of using MOP and MOE for assessment does not just apply to combat operations – the concepts also easily apply to stability operations and to support to civil authorities. In stability operations, there may be a number of objectives that easily translate to MOP and MOE measures. To go back to the example from Northern Iraq in chapter 5, if a logical line of operation (or line of effort) in a stability operation is the establishment of the rule of law, there will be a number of tasks that are given to units to support the legal system in a region.

Figure 9-3 is a similar figure as shown in chapter 5 (Figure 5-13), with the logical line of operation to "establish the rule of law," which is also an operational objective. To accomplish this operational objective, there are a number of associated key tasks (which are measure of effectiveness), as shown in Figure 9-4.

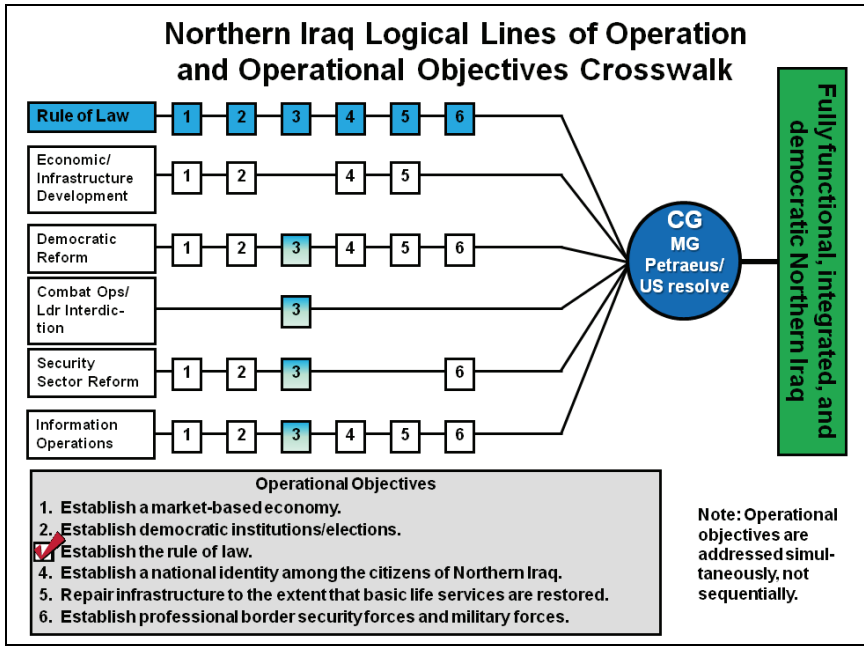


Figure 9-3

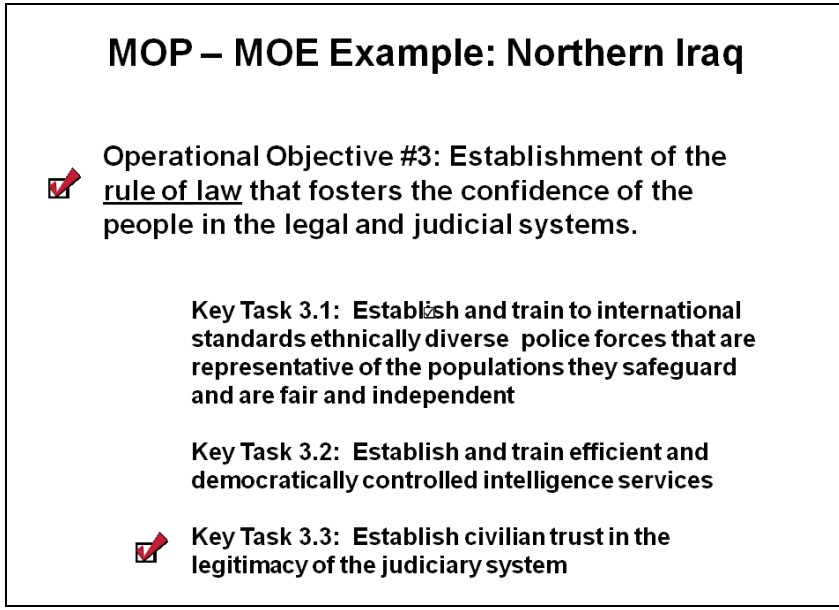


Figure 9-4

Figure 9-5 shows the associated sub-tasks with Key Task 3.3, "establish civilian trust in the legitimacy of the judiciary system." These subtasks indicate measure of performance – which should lead to the accomplishment of the measure of effectiveness in the Key Task, which should in turn lead to the end state:

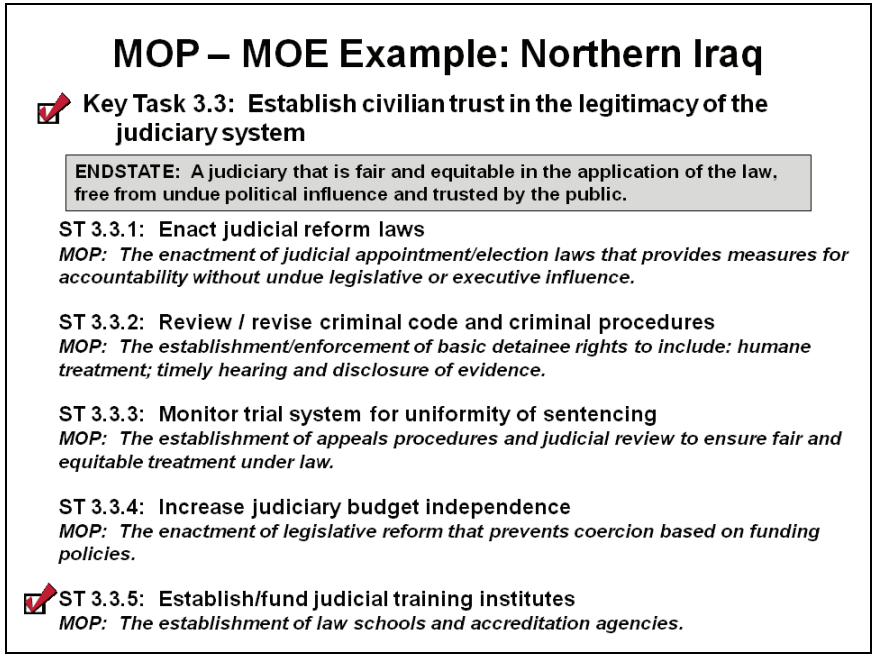


Figure 9-5

The task and purpose for a unit assigned responsibility for this key task could be stated in such a way:

> ***Establish/fund judicial training institutes <u>in order to</u> establish civilian trust in the legitimacy of the judiciary system and to further the establishment of the rule of law that fosters the confidence of the people in the legal and judicial systems.***

In this case, the MOP and MOE could be:

MOPs:

- Numbers of judicial training institutes established
- Amount of funding contributed for institutes
- Establishment of accreditation agency for law schools

MOEs:

- Increase in public trust in the judiciary system
- Increase in confidence in the legal and judicial systems

Another example from a support to civil authorities example (Hurricane Katrina) could be in support of a line of effort for "safeguarding citizenry" with a effort directed towards public health and medical services as shown in Figure 9-6.

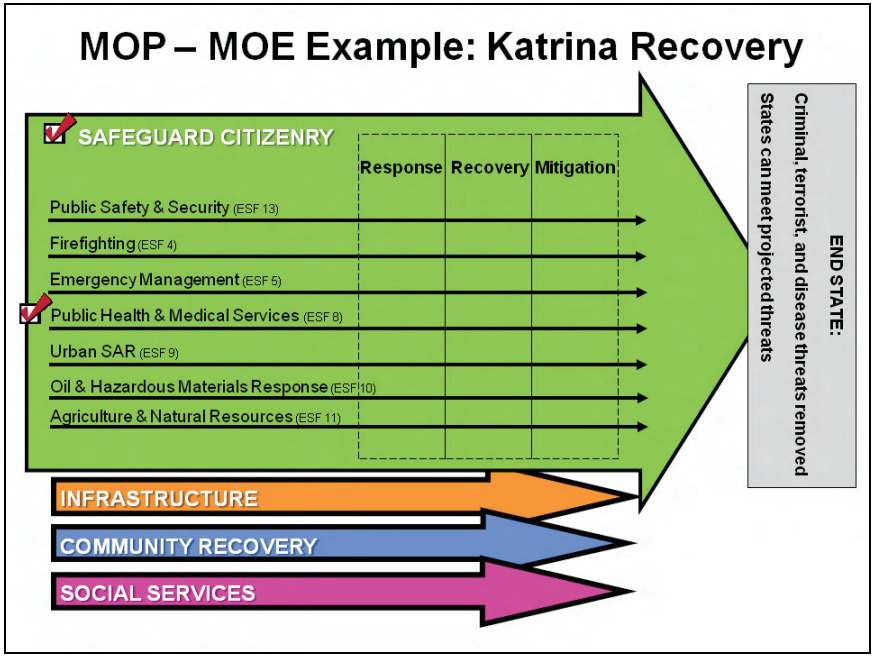


Figure 9-6

The task and purpose for a unit assigned responsibility along this major effort could be stated in such a way:

> ***Re-establish public health and medical services <u>in order to</u> remove disease threat to save lives, mitigate human suffering and restore critical services and to enable the transfer of DOD relief operations to civil authorities.***

In this case, the MOP and MOE could be:

MOPs:

- Number of patients treated
- Number of hospitals operational
- Number of vaccines administered

MOEs:

- Decrease in disease threat
- Restoration of critical services in the community
- Increased ability of civil authorities to respond

In both of these cases, the MOPs relate to the task, are primarily quantitative measures, and are focused on the internal actions of the unit. MOEs, on the other hand, relate to the purpose, are primarily qualitative measures, and are focused on the external effects that result from the unit's actions.

Bottom Line: Understanding how to apply MOPs and MOEs for assessments is a critical task in both planning and during operations. JP 3-0 provides the following summary:

> Assessment is a process that measures progress of the joint force toward mission accomplishment. The assessment process begins during mission analysis when the commander and staff consider what to measure and how to measure it to determine progress toward

> accomplishing a task, creating an effect, or achieving an objective. The assessment process uses measures of performance to evaluate task performance at all levels of war and measures of effectiveness to measure effects and determine the progress of operations toward achieving objectives. [8]

Selecting appropriate MOPs and MOEs – and relating them to task and purpose – can ensure that actions are focused on the desired end state.

Notes

1. FM 3-07, paragraph 4-69.
2. JP 5-0, III-61.
3. Ibid., III-60.
4. Ibid., III-60 – 61.
5. FM 3-0, paragraphs 5-86 – 5-87.
6. FM 3-07, paragraph 4-67.
7. Ibid., paragraph 4-68.
8. JP 3-0, xxi.

Chapter Ten

Conclusion

The purpose of this monograph is straightforward: to provide tools for campaign planning and assist planners in considering not only the traditional warfighting aspects of campaign planning but also all the other actions that are necessary for success in winning the war and ultimately winning the peace. Campaign planning should not be thought of as just a linear process with distinct phases and sequential actions. These tools should help planners to address campaign planning to win not only the traditional defensive and offensive operations that are inherent in campaigns but also the stability operations and support operations that have gained increasing importance—to win battles as well as winning the war and setting the conditions for winning the peace.

Each chapter has described an issue in campaign planning and provided a tool or tools to address those issues. These tools can be combined or used separately in planning to help the commander visualize the campaign. Following is a review of the bottom lines for each chapter:

Chapter One. Separate the issues of critical reasoning (identifying the problem) and creative thinking (identifying the solution). Do not cheat on critical reasoning. If you do, you may well have the best solution but for the wrong problem. When developing the solution, use a combination of innovative and adaptive approaches.

Chapter Two. Keep in mind the separate components of ends, ways, and means when approaching campaign planning. Determine the ends first, then analyze the means available, and finally determine the ways to accomplish the ends.

Chapter Three. Determining the friendly and enemy COGs (and decisive points) at the strategic, operational, and tactical levels is critical for linking plans to the end state. Continually

reassess the COGs, and use them as a sanity check to ensure you stay focused on attacking the enemy COGs while protecting the friendly ones.

Chapter Four. Think of COAs in terms of both simultaneous and sequential actions; all components of a campaign will not be linear. Think beyond the campaign at the operational level. "Winning the conflict is more than winning in combat" means setting the conditions for the strategic end state. Develop COAs using task organization, scheme of maneuver, main effort, defeat/stability mechanism, and anticipated use of reserves.

Chapter Five. The construct of logical lines of operation provides a methodology with which to visualize campaigns, particularly when there are a variety of offensive, defensive, stability, and support operations that occur simultaneously. Using the logical lines of operation enables the planner to synchronize activities and ensure that all operations contribute to achieving the desired end state. Using logical lines of operation also helps ensure that offensive, defensive, stability, and support operations are integrated in the plan and that the effects of all of the operational objectives and key tasks are considered in terms of each logical line of operation.

Chapter Six. The CV construct provides a methodology by which to link targeting to the COG and the end state. Translating the COG into CV provides a useful tool for the planner to visualize the campaign using a systems approach.

Chapter Seven. TVA and CVA are similar but approach the targeting problem from two different perspectives. TVA approaches targeting from what the enemy has; CVA approaches targeting from enemy deficiencies. John Warden's systems model provides another useful methodology for approaching targeting.

Chapter Eight. Conducting a wargame of a COA at the operational level follows the same basic steps as a wargame at the tactical level:

- Gather the tools
- List and review friendly forces
- List and review adversary forces
- List assumptions.
- List known critical events and decision points
- List evaluation criteria
- Determine participants
- Determine adversary courses of action (COA)
- Select wargaming method
- Select a method to record & display wargaming results
- Wargame the battle and assess the results.

At the operational level, wargaming should use a modified box method with proponents for each of the logical lines of operation for both enemy and friendly actions. During each turn of the wargame, each proponent should identify actions along their line of operation as well as the effects of actions in other logical lines.

Chapter Nine. Understanding how to apply MOPs and MOEs for assessments is a critical task in both planning and during operations. The assessment process uses measures of performance (MOP) to evaluate task performance at all levels of war and measures of effectiveness (MOE) to measure effects and determine the progress of operations toward achieving objectives. Selecting appropriate MOPs and MOEs – and relating them to task and purpose – can ensure that actions are focused on the desired end state.

In closing, I think it is important to remember the context for campaign planning. The following is from JP 3-0, page IV-3:

> Operational art is the application of creative imagination by commanders and staffs—supported by their skill, knowledge, and experience—to design strategies, campaigns, and major operations and organize and employ military forces. Operational art integrates ends, ways, and means across the levels of war. It is the thought process commanders use to visualize how best to efficiently and effectively employ military capabilities to accomplish their mission. Operational art also promotes unified action by helping JFCs and staffs understand how to facilitate the integration of other agencies and multinational partners toward achieving the national strategic end state.
>
> . . . Operational art requires broad vision; the ability to anticipate; and the skill to plan, prepare, execute, and assess. It helps commanders and their staffs order their thoughts and understand the conditions for victory before seeking battle, thus avoiding unnecessary battles. Without operational art, campaigns and operations would be a set of disconnected engagements.

Appendix A
Examples

The following pages contain some examples of past products – again, these examples do not provide the way to apply some of the tools from campaign planning, but are just examples of how some of the concepts contained in this monograph can be applied.

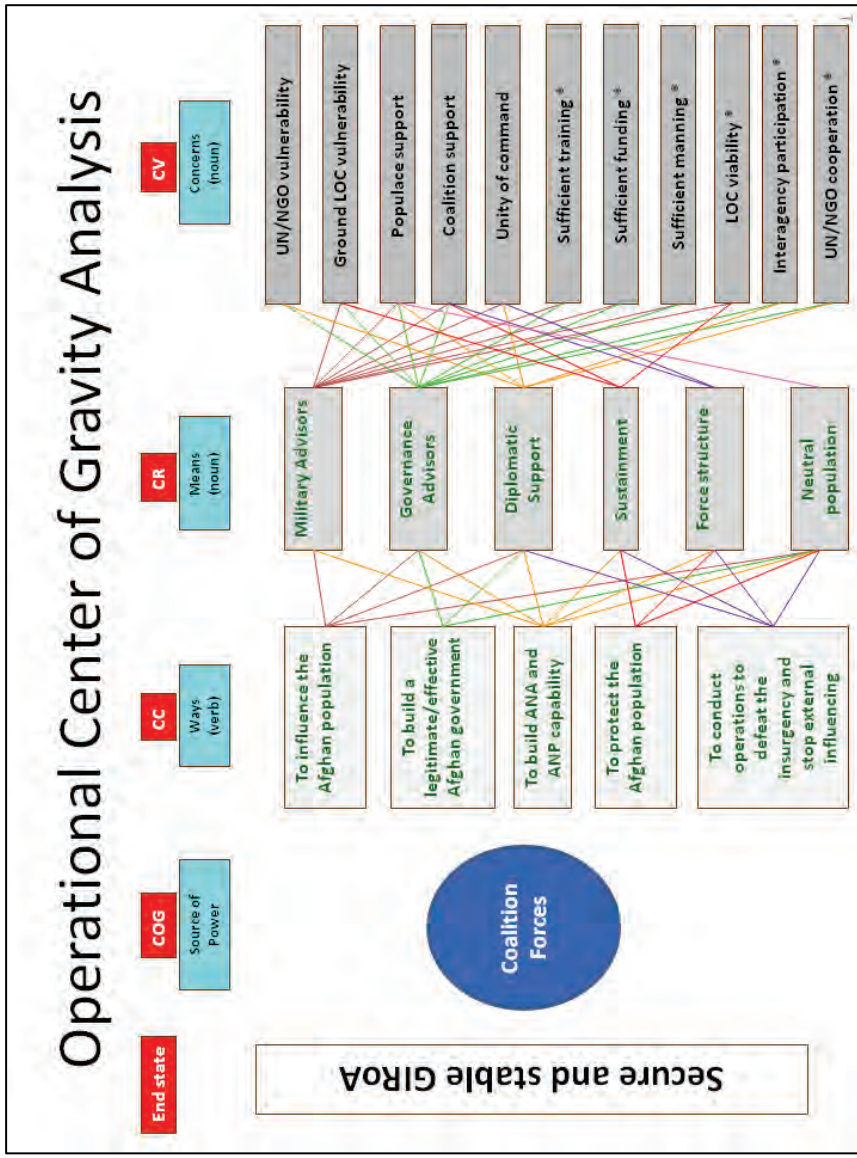

Operational Center of Gravity Analysis
End state
COG
Source of Power
CC
Ways (verb)
CR
Means (noun)
CV
Concerns (noun)
Secure and stable GIRoA
Coalition Forces
To influence the Afghan population
To build a legitimate/effective Afghan government
To build ANA and ANP capability
To protect the Afghan population
To conduct operations to defeat the insurgency and stop external influencing
Military Advisors
Governance Advisors
Diplomatic Support
Sustainment
Force structure
Neutral population
UN/NGO vulnerability
Ground LOC vulnerability
Populace support
Coalition support
Unity of command
Sufficient training *
Sufficient funding *
Sufficient manning *
LOC viability *
Interagency participation *
UN/NGO cooperation *

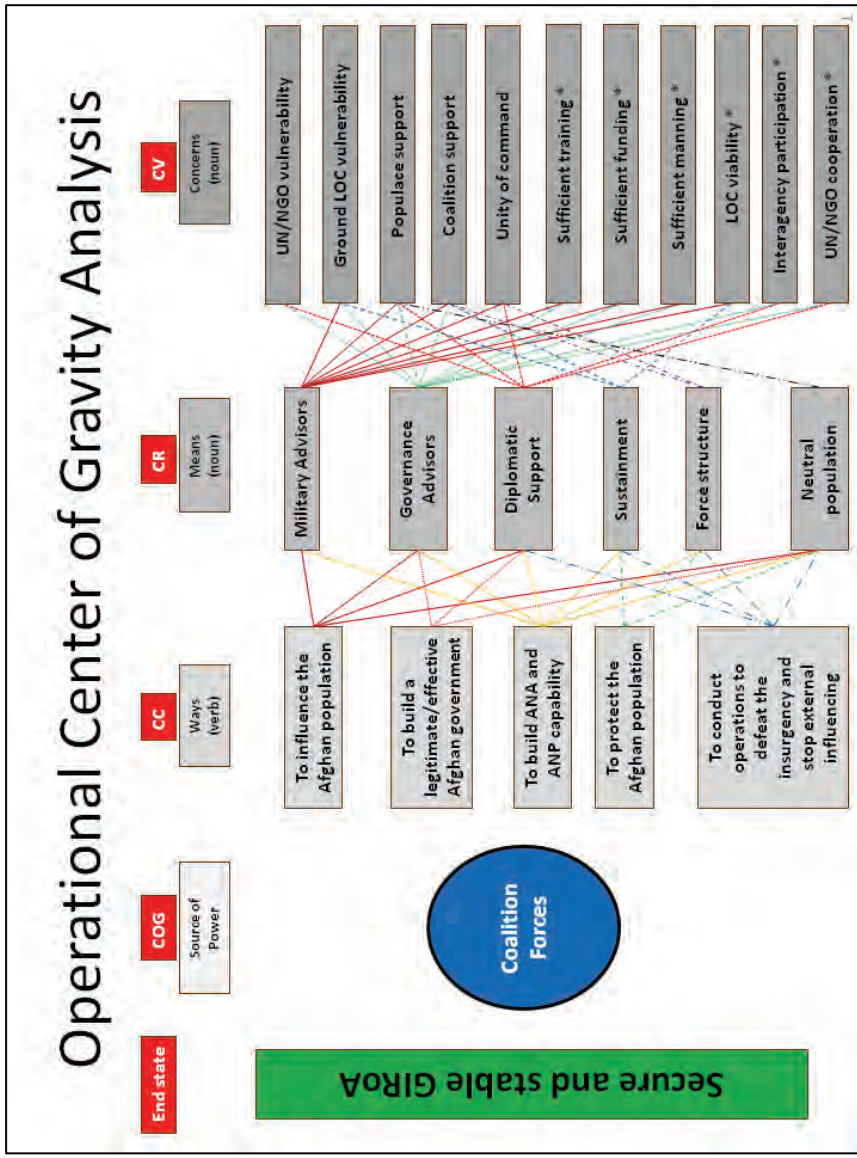
Figure A-1

Figure A-1 on the previous page is an example of how to do a crosswalk of the center of gravity analysis using the CC-CR-CV methodology.

Note that the example displays the friendly endstate to the far left; the end state is accomplished by the Center of Gravity (in this case, coalition forces) applying their critical capabilities (CC). The CC is shown as the "ways" that the COG will achieve the end state, and is expressed in verb form.

The critical capabilities require certain critical requirements (CR); the CR are displayed as means – and in noun form. Note that the CC need more than one CR, and that the CR are not independent, but are used to support multiple CC.

The critical vulnerabilities (CV) are displayed as the concerns because of shortages or deficiencies that are vulnerable to exploitation by the adversary. The CVs listed are not independent; many of the CVs are concerns for multiple CR.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Unity of command
Sufficient training*
Sufficient funding*
Sufficient manning*
LOC viability*
Interagency participation*
UN/NGO cooperation*

Figure A-2

Figure A-2 on the previous page shows the logical lines of pperation, as well as the operational objectives along each of the lines. In this example, the friendly center of gravity (coalition forces) is depicted on the left side – the COG, the source of power, uses the logical lines of operation to "channel" that power to meet the end state. In this example, the end state is shown as the different conditions that should exist along each of the logical lines of operation. This example also shows the defeat and/or stability mechanism that characterizes operations along each logical line of operation.

This example is also unique; the example indicates a "full spectrum operation" that includes a combination of offense, defense, and stability operations. The efforts of the coalition are focused against an adversary (threat forces) as well as focused towards stabilizing the host nation. In the initial appreciation of the problem, the greatest hindrance to supporting the establishment of a functional Afghan government was the cultural component of the Afghan tribal culture – and hence, the logical lines of operation use the stability mechanism of support to enable the governance, infrastructure, and development of the ANA and ANP forces.

The key is that the logical lines of operation help the coalition forces to synchronize their actions along multiple lines to accomplish objectives – and thereby establish conditions that lead to the desired end state.

Endstate – MOE / MOP Crosswalk

LLOs	Conditions	MOEs	MOPs
Information Operations (across all LOOs)	• Afghan populace comprehends message and is at least neutral	• > 65% of Afghan populace approves of GIRoA	• # of media outlets • # of messages countered
Support to Governance	• Functional, legitimate government capable of self-rule	• > 65% of Afghan populace approves of GIRoA	• # of people with basic needs met • # of people receiving basic utilities
Security / Combat Ops	• Insurgent activity neutralized, populace is confident in Governments ability to secure citizens	• BCTs providing security to PRTs	• Decrease in # of daily attacks by province
Reconciliation	• Co-opt all insurgents capable and willing to reconcile	• # of belligerents who no longer oppose GIRoA	• # of Key Leader Engagements
Infrastructure Development	• Establish infrastructure commensurate or better than 1979 Afghan standards	• % of population accessible to governmental infrastructure	• # of schools • # of markets active • # of miles paved
Train / Employ ANA / ANP	• 134,000 trained members of the ANA	• ANA/ANP Forces securing province independently	• # of ANA / ANP units capable of independent ops • Increase in retention rate

Figure A-3

Figure A-2 on the previous page shows the crosswalk of the logical lines of operation, the conditions for each of the logical lines of operation, and the measures of effectiveness and measures of performance that lead to those conditions.

It goes without saying that this is an inexact science, but this provides a tool to determine success or failure along each of the logical lines of operation – and insight for the commander to consider prioritization of assets.

Note that the most problematic area in the chart is to determine measures of effectiveness; in many ways, the MOE shown in the chart is more accurately described as indicators that provide an indirect measure of effectiveness.

About the Author

Dr. Jack D. Kem retired as a colonel from the US Army in 1998, having served as a field artillery and military intelligence officer. He is currently the Commandant's Distinguished Chair of Military Innovation and Supervisory Professor, Department of Joint, Interagency, and Multinational Operations (DJIMO), U.S. Army Command and General Staff College, Fort Leavenworth, Kansas. He holds a B.A. from Western Kentucky University, an M.P.A. from Auburn University at Montgomery, and a Ph.D. from North Carolina State University. His current research interests include innovation, ethics, spirituality, military transformation, and campaign planning.