

Center of Gravity Analysis

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MILITARY STUDENTS defining the concept of the center of gravity (COG) are like blind men describing an elephant. They know a definition exists, but they describe it according to their own experiences, and invariably someone will define COG as “the will of the people.” The center of gravity is too important a concept to guess at. Joint Publication (JP) 5-0 (Draft 2), *Doctrine for Joint Planning Operations*, clearly states the critical role of COG analysis: “The most important task confronting campaign planners in this process is being able to identify friendly and adversary strategic centers of gravity; that is, the sources of strength, power, and resistance.”¹ The reason identifying centers of gravity is the most important task is because a “faulty analysis of friendly or adversary centers of gravity can have very serious consequences; specifically, the inability to accomplish the military objectives at an acceptable cost and the unconscionable expenditure of lives, time, and materiel in efforts that do not produce decisive strategic or operational results.”²

There are two reasons why centers of gravity are so difficult to identify or define. First, the armed services suffer from years of conflicting definitions for center of gravity. Not until 1997 did they agree to the current joint definition.³ Second, the services teach a COG theory without a practical framework to make the theory useful. Fixing the problem is easy; the joint community must agree on a simple definition and provide a framework.

What are Centers of Gravity?

Centers of gravity are sources of power. Joseph Strange of the U.S. Marine Corps War College defines centers of gravity as the “primary sources of moral or physical strength, power, and resistance.”⁴ A center of gravity is the source of power that creates a force or a critical capability that allows an entity to act or accomplish a task or purpose.

Ignore the joint definition; it only leads to confusion and debate. Prussian strategist Carl von

Clausewitz states, “Out of the characteristics a certain center of gravity develops, the hub of all power and movement, on which everything depends. That is the point against which all our energies should be directed.”⁵

However, Clausewitz’s definition, according to U.S. Army and joint doctrine, misses the mark, so the joint community changed it by limiting sources of power to military systems and by defining centers of gravity as “those characteristics, capabilities, or localities from which a military force derives its freedom of action, physical strength, or will to fight.”⁶ According to this definition, only military forces have centers of gravity; nations and other systems do not. Most planners and strategists ignore this limitation, but the definition is flawed, nonetheless.

The joint definition also gives the impression that military forces are not centers of gravity themselves but only possess them. The current joint definition should replace “military force” with something like “system” or “entity.” This change would broaden the definition to include nations or organizations. Next, the definition should be simplified by replacing “characteristics, capabilities, or localities” with simple words like “source,” “agent,” or “things.” Next, we should drop terms like “freedom of action,” “physical strength,” or “will to fight” and replace them with the plainer “ability to act.” We should drop “physical strength” and “will to fight” entirely because they are prerequisites for freedom of action. Without “will” or “strength,” one cannot act, and the ability to act is a definition of power.⁷ The simplified joint definition of center of gravity then becomes “a system’s source of power to act.”

Requirements and Vulnerabilities

Once having defined “center of gravity,” we next need to build a framework for understanding and identifying it. Essential to understanding the center of gravity is understanding “critical capabilities,” “critical requirements,” and “critical vulnerabilities.”⁸

JP 5-0(D2) calls these “critical factors.”⁹ These factors possess tremendous planning and instructional utility because they establish a sensible hierarchy with logical relationships. Strange gives the following definitions:

□ Critical capabilities, which are “primary abilities [that merit] a center of gravity to be identified as such in the context of a given scenario, situation, or mission.”¹⁰ Critical capabilities generate force or persuasion. The center of gravity is the source of power for critical capabilities, and critical capabilities are what a center of gravity can do. For example, an organization establishes a goal. The critical capability is the means to achieve that goal. The center of gravity is the source of power or the possessor of that critical capability.

□ Critical requirements (CR) are “essential conditions, resources and means for a critical capability to be fully operative.”¹¹ Without critical requirements, a center of gravity cannot function successfully and will cease being a source of power that generates the critical capability. The key word is “critical.” Although a system might require many things, few requirements are critical. The task is to identify those that are.

□ Critical vulnerabilities (CV) are “critical requirements or components thereof which are deficient, or vulnerable to neutralization, interdiction, or attack (moral/physical harm) in a manner achieving decisive or significant results, disproportional to the military resources applied.”¹² More simply, critical vulnerabilities are critical requirements or components that are vulnerable to attack or disruption. Critical vulnerabilities make great targets and objectives or, conversely, things to protect. Students and planners often make the mistake of correctly

identifying a critical vulnerability but misidentifying it as a center of gravity.

If one understands these critical factors, separating genuine centers of gravity from apparent centers of gravity becomes easy. One must acknowledge that centers of gravity are not self-sufficient. They require input to produce capabilities or force. The ability to produce a capability or force defines a center of gravity and separates it from resources or requirements.

A helpful validity test for identifying a center of gravity and distinguishing it from CRs or CVs is the “does/uses” test. The “does” test identifies the critical capability. Only centers of gravity are inherently capable of performing a particular task or achieving a specific purpose. In other words, the system “does” the work and is the source of power that generates the force or critical capability. The “use” test identifies something that the system “uses” to perform a task or achieve a purpose; it is a “requirement.”

A railroad has tracks, fuel, operators, cars, locomotives and administrative and support activities. (See figure.) The critical capability is the ability to move freight. The locomotive is the center of gravity because only it has the inherent capability to move freight (the critical capability). Only the locomotive can create the force to accomplish the mission. The tracks, cars, operators, and fuel are CRs. The locomotive uses them. If any of the CRs are vulnerable to interference they become CVs.

Finding a Center of Gravity

How does one discover a center of gravity? Sun Tzu provides a clue. He says, “Know the enemy and know yourself. . . .”¹³ Finding the center of gravity requires work. A commander needs to know how

— Determining “Does/Uses” Criteria —

Item	“Does/Uses”	Explanation
Tracks	No	The tracks do nothing themselves. The locomotive uses the tracks to support and guide it.
Fuel	No	The fuel is not an actor. The locomotive uses the fuel.
Cars	No	The cars carry the freight, but they cannot move it on their own. The locomotive moves the cars.
Operators	No	Operators are critical, but they do not have the inherent capability to move freight by themselves.
Locomotive	Yes	The locomotive is the doer. It has the inherent critical capability to perform an action.

his opponent's and his systems operate and their strengths and weakness. Gaining this understanding is the most difficult part of COG analysis and requires a holistic view of the organization's systems. A commander must avoid the temptation to skip a holistic systems analysis and jump to identifying vulnerabilities because he might mistakenly identify them as centers of gravity.

There are four steps in analyzing an enemy's center of gravity:

1. Determine the enemy's critical capability, the absolutely essential function the enemy's system performs. The system might have several capabilities, but not all are critical in every situation.
2. Identify the enemy's critical capability's source of power, which is the enemy's center of gravity.
3. Identify the center of gravity's critical requirements.
4. Identify the critical requirements or components that are vulnerable to attack or disruption. These CVs become targets to attack or are requirements for the enemy to protect.

What does one do with a center of gravity after it is identified? Remember, the essence of a campaign plan is a focused effort against an enemy's center of gravity while protecting one's own.

Attacking a Center of Gravity

There are two ways to attack a center of gravity: directly or indirectly. Both are valid, and the choice depends on resources available. If an enemy's center of gravity is vulnerable, a direct attack might be desired, but direct attacks on centers of gravity are difficult and costly. An indirect approach might be more appropriate.

An indirect attack against an enemy center of gravity's CRs causes a center of gravity to lose its critical capability or ability to generate force. In this case, some of a center of gravity's CRs might be vulnerable to attack or disruption. A direct attack on a COG's requirements is an indirect attack on the COG proper.

Strategic centers of gravity. When one talks about centers of gravity, one talks about power or the ability to act or to prevent others from interfering. At the strategic level there are only two elements of national power: military power or economic power. We must not be misled by the other so-called elements of power: diplomacy and information (the oft-cited "will of the people"). At the national or strategic level, a center of gravity is either a military/security capability or an economic/industrial capability. In total war, a strategic center of gravity is an

economic/industrial capability. In limited wars, a strategic center of gravity is almost always a military/security capability.

If this distillation of strategic centers of gravity seems too simple, consider the following. Diplomacy is merely a negotiation on using military or economic power to influence others. Foreign policy without military or economic clout is like the Vatican's foreign policy; it succeeds only with the cooperation of the willing. Joseph Stalin knew this when he asked how many divisions the Pope had. The UN's diplomacy only works when its members possess enough military or economic backing.

Conventional wisdom holds that information is power. I disagree. Information is not power; it is a tool, an enabler. It helps one wield military or economic power. By itself, it is simply information.

What about the "will of the people" or great leaders? Why is Franklin D. Roosevelt, Winston Churchill, Joseph Stalin, or the will of the people not a center of gravity? The answer is simple if one recalls critical capability versus critical requirement. Although these World War II leaders were critical requirements who enabled the center of gravity to be created or function, none by himself had the inherent ability to defeat Germany and Japan; therefore, none was a center of gravity. They were the operators and fuel for the locomotive.

Still confused? Consider the Chinese resistance to Japanese occupation during World War II. The Chinese will was against the Japanese occupation. If the Chinese will to resist was a center of gravity, it should have had, by itself, the inherent ability to drive out Japan, but it could not because it did not have that ability. It was not a center of gravity.

If I asked my son why the Allies won World War II, he would say the Allies won because they had more "stuff." In other words, the Allied center of gravity was its economic/industrial capability, specifically, America's industrial capability. The Axis did not have the ability to break the Allied center of gravity, although the German U-Boat campaign came close to breaking that strategic center of gravity's critical requirement (shipping). Ultimately, Germany lost the war because the Allies' center of gravity was too strong and produced ever more ships to carry ever more stuff. Likewise, after inviting the U.S. to the Great Pacific War, Japan went on the defensive and never mounted much of an attack against this same strategic center of gravity or its critical requirements. So Japan, too, lost.

Operational centers of gravity. Defeating an enemy's strategic centers of gravity in a single strike

is difficult if not impossible. So, as with attacking any complex problem, we can break strategic centers of gravity down into more manageable pieces. Campaigns focus on these pieces, which are operational centers of gravity. A campaign should be part of a step-by-step process that directly or indirectly attacks these operational centers of gravity or sets the stage for future campaigns that attack operational centers of gravity. The defeat of operational centers of gravity weakens strategic centers of gravity.

An operational center of gravity is something that protects a strategic center of gravity. Typically, operational centers of gravity are military capabilities or forces. Another way to define an operational center of gravity is to identify what blocks a commander's direct access to his opponent's strategic center of gravity. Identifying obstacles reveals a strong candidate for an operational center of gravity. Almost always an operational-level center of gravity will be a military/security capability.

Identifying and defining a center of gravity focuses military effort. Therefore we should avoid broad definitions. Identifying and defining a center of gravity requires careful analysis. For example, it might be more useful to identify strategic nuclear forces, land power, or a specific type of unit or capability as the center of gravity rather than simply saying "military forces."

What They Is and What They Ain't

The following are things that can be and often are centers of gravity:

- Joint forces.
- Nuclear forces.
- Land power.
- Sea power.
- Air power.
- Special operations forces.
- Unconventional forces, including terrorists.
- State security forces.
- Specific units.

The following are things often mistakenly identified as centers of gravity:

- The will of the people. (This might be a requirement. If the will creates a force, the force could be a COG.)
 - Leadership/key personality. (This is just another potential requirement; after all, Churchill still needed military force to enact his will.)
 - Air ports or sea ports of debarkation. (Is the Port of Pusan the force holding back the North Korean Army?)

- Strategic mobility. (This would make FedEx a center of gravity.)

- Lines of communication. (Lines of communications are just rails in a railroad in need of a locomotive.)

- Resources. (By themselves, resources are not COGs. The COG would be the control of the resource market. Otherwise resources might be requirements for a COG.)

- Time. (Time is, perhaps, a requirement or even a strategy, but try stopping your opponent by calling time out.)

- The media. (The media is a tool to influence the will of the people and key leaders, which is only a requirement.)

- Coalition/allies. (Coalition partners or allies might be required to bring or add to real COGs [military or economic might].)

The following rules will help lead us in the right direction:

- Determine COG "do and use."
- Determine if COGs are military/security or economic/industrial.
- Determine if, at the strategic level with full mobilization, the COG is an economic/industrial capability. At less than full mobilization, the center of gravity is a military/security capability.
- Determine if, at the operational level, the COG is a military/security capability.
- Be specific.

The COG is a powerful warfighting tool. Understanding its definition and the framework of critical factors should reduce the confusion. **MR**

NOTES

1. U.S. Joint Chiefs of Staff, Joint Publication (JP) 5-0, *Doctrine for Planning Joint Operations* (Washington, DC: U.S. Government Printing Office [GPO], December 2002, draft 2), IV-12.
2. *Ibid.*, IV-13.
3. Joe Strange, *Centers of Gravity & Critical Vulnerabilities* (Quantico, VA: U.S. Marine Corps Association, 1996), 93-96.
4. *Ibid.*, ix.
5. Carl von Clausewitz, *On War*, trans. and eds. Michael Howard and Peter Paret (Indiana: Princeton University Press, 1984), 595-96.
6. JP 5-0 (draft 2), GL-4. Draft 2 deletes the word "localities" from the definition.
7. *Merriam-Webster's Collegiate Dictionary* (Springfield, MA: Merriam-Webster Inc., 1999), 913.
8. Strange, ix.
9. JP 5-0 (D2), IV-13.
10. Strange, ix.
11. *Ibid.*; JP 5-0 (D2), IV-13, has accepted this definition.
12. *Ibid.*, ix; JP 5-0 (D2), IV-13, uses the term "aspects" in lieu of "critical requirements."
13. Sun Tzu, *The Art of War* (London: Oxford University Press, 1963), 84.

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