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Army Deployments to OIF and OEF

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Laurie L. McDonald

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Preface

In October 2008, the Vice Chief of Staff of the U.S. Army asked RAND Arroyo Center to assess the demands placed upon the Army by deployments to Operation Enduring Freedom (OEF) in Afghanistan and Operation Iraqi Freedom (OIF) in Iraq. The timing of this request coincided with some publicly voiced misconceptions regarding the Army's capacity to deploy additional soldiers to Operations Enduring Freedom and Iraqi Freedom.

Analyzing Department of Defense (DoD) deployment data through December 2008, Arroyo found that the Army has provided over 1 million troop-years to OIF and OEF, and most soldiers now deployed to OEF and OIF are on their second or third tour. Those soldiers who have not yet gone to OEF and OIF typically fall into one of two categories: new soldiers, needing to complete training before deployment; and experienced soldiers, needed for missions outside of Iraq and Afghanistan.

The demand for active-duty soldiers in OEF and OIF would have exceeded supply under the Army's normal deployment policies, so the Army took several actions to increase supply: it increased the overall size of the active component; it reassigned soldiers from other missions to the pool of soldiers rotating to OEF and OIF; and it greatly increased the rate at which soldiers rotate to and from the wars—to a rate that the Chief of Staff of the Army has characterized as unsustainable. The Army retains very limited unutilized capacity to deploy additional active-duty soldiers beyond the current troop levels in OEF and OIF.

This work was performed as a direct-support effort by RAND Arroyo Center to the Office of the Vice Chief of Staff, U.S. Army, and to the Army Quadrennial Defense Review (QDR) Office. It should be of interest to those within the Army and the Department of Defense planning the nation's future force structure. RAND Arroyo Center, part of the RAND Corporation, is the

U.S. Army's federally funded research and development center for policy studies and analyses.

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Summary

In October 2008, the Vice Chief of Staff of the U.S. Army asked the RAND Arroyo Center to assess the demands placed upon the Army by the continuing deployments of soldiers to operations in Iraq and Afghanistan. As part of Arroyo's response, we conducted the analyses documented here in order to give the Army and other policymakers a fresh look at Army deployments.[1] In this analysis we addressed three broad questions:

1. How many soldiers has the Army been asked to maintain in theater over the course of OEF and OIF? How does this demand for soldiers compare with the numbers of troops maintained in theater by the other services?

2. How does the demand for soldiers translate into a rate of soldiers deployed? What has the Army done to reduce the individual deployment ratio by increasing the number of soldiers it can deploy?

3. Of the soldiers on active duty today, how many have deployed? How many have not yet deployed, and for what reasons?

The principal source of data for this analysis was the Defense Manpower Data Center (DMDC). DMDC uses the Contingency Tracking System (CTS) to track personnel involved in contingency operations. A deployment for OEF/OIF is defined as "a DoD Service member who is or has been *physically located* within the OEF/OIF combat zones or areas of operation (AOR), or has been *specifically identified* by his/her service as 'directly supporting' the OEF/OIF mission outside the designated combat zone (e.g., U.S. Air Force

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[1] Additional analyses are under way within RAND Arroyo Center to address this request.

aircrew or support personnel located at an airbase outside the combat zone)."[2] By using this source, we ensured that our data would be consistent with those used by DMDC, other offices within the Office of the Secretary of Defense (OSD), and the other services in their analyses.

Army Troop Levels Maintained in OIF and OEF

We found that the Army has provided over 1 million troop-years to OIF and OEF through December 2008.[3] Active-duty soldiers alone have contributed over 700,000 troop-years to these two wars. From the beginning of OIF in March 2003 through December 2008, the Army has maintained an average of 117,000 active-duty soldiers in OIF and OEF combined. The combined average increased to 128,000 active-duty soldiers from September 2005 through December 2008.

In the process of accumulating this much deployed time, most of the active-duty soldiers in the Army (67 percent) have deployed to OIF or OEF— and most of those soldiers have deployed for a second or third year. Approximately 373,000 of the soldiers in the Army as of December 2008 had served in OIF or OEF.[4] Over 121,000 have deployed for their first year, 173,000 for their second year, and 79,000 for their third year or longer. Of this last group, over 9,000 are deploying for their fourth year. The burden falls most heavily on the middle ranks of the officers and the noncommissioned officers. These soldiers have more deployed time than their counterparts from the other services.

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[2] Michelle Rudolph, Defense Manpower Data Center, prepared for the 10th Annual Force Health Protection Conference, 4–10 August 2007. See the appendix for additional details regarding the CTS database.

[3] Total of all Army active-duty and mobilized reserve component soldiers who have served time in OIF or OEF since the beginning of these conflicts. This includes soldiers who have subsequently left the service.

[4] These 373,000 are all of the soldiers, still on active duty as of December 2008, who deployed one or more times to OIF or OEF.

Soldier BOG:Dwell Ratios

To maintain a high number of soldiers in theater, the Army has deployed them at BOG:Dwell ratios between 1:1 and 1:2—and closer to 1:1—since the beginning of OIF. Boots on ground, or BOG, refers to the time that soldiers spend in theater at their deployed locations. "Dwell" is supposed to represent the time that soldiers spend at their home stations. (In practice, however, the time spent traveling to theater, the time spent traveling home, and the time training away from home station is counted as dwell.)

The BOG:Dwell ratios the Army has sustained in OIF and OEF show that soldiers have deployed more often than the DoD goal of 1:2 for the active component. The Army has increased end strength, moved soldiers from Korea and Europe to home-stationed units, and has decreased the size of the generating force in order to generate more deployable soldiers. However, until recently, demand has increased as quickly as the number of available soldiers— so no net easing of deployment ratio has resulted.

Soldiers Not Yet Deployed

We examined the statement that roughly one-third of the Army has "never deployed" to OIF and OEF. [5] We found that most of the soldiers included in this category are relatively new to the service, and are often still in training. Therefore, a better characterization for these soldiers (and likely the new members of other services) is "not-yet-deployed" to Iraq or Afghanistan. Out of an active-duty strength of 557,000 soldiers as of December 2008, the Army had deployed 373,000 soldiers. The remaining 184,000 soldiers had not yet deployed. New soldiers account for a majority (109,000) of the Army's "not-

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[5] See, for example, the briefing by Kris L. Hoffman, Defense Manpower Data Center, entitled "Deployment Accountability Update (June 2008 CTS Deployment File)," prepared for the Honorable Dr. David S.C. Chu, Under Secretary of Defense for Personnel and Readiness, July 31, 2008.

yet-deployed" numbers, and roughly 4,000 more personnel are cadets at the U.S. Military Academy, who count toward active-duty end strength.

Of the remaining 71,000, there are over 10,000 soldiers forward-stationed in Korea, Europe, or other overseas locations who have not yet served in OIF or OEF. Another 27,000 are in military occupational specialties that support the current war efforts or other contingency missions, but are not located within Iraq or Afghanistan.

That leaves 34,000 soldiers—of which 3,000 have been injured prior to deployment and are in warrior transition units. The final 31,000 soldiers (about 5.6 percent of the active-duty force) are in the United States, have more than two years in the Army, but have not yet deployed to OIF or OEF.

To recapitulate, the breakout of soldiers in the Army as of December 2008 is as follows:

- 67 percent of the active-duty Army has deployed and contributed a large, and growing, cumulative time deployed in theater.
- 20 percent are recently accessed (including U.S. Military Academy cadets); most of these will deploy when ready, depending on requirements in the OIF and OEF theaters.
- 2 percent have not yet deployed to OIF or OEF and are currently deployed to other overseas locations; they may be rotated through OIF or OEF as they are borrowed from their current stations or after they complete these assignments.
- 5 percent have not yet deployed to OIF or OEF and are in key jobs supporting global military operations; these soldiers too may deploy if they are sent as individual replacements, or, as above, they may deploy in a subsequent assignment.
- 3,000 additional soldiers were hurt prior to deploying.

Therefore, in total, our assessment is that virtually all of the Army's currently serving soldiers have either already deployed to OIF/OEF at least once (67 percent) or simply have not served long enough to get deployed (20

percent). Of the remainder, 7 percent is made up of soldiers who have not had an opportunity to deploy to OIF/OEF because they have been needed elsewhere, or have been injured prior to deploying. This leaves a small portion of the force—less than 6 percent—made up of soldiers who have been in the Army more than two years, are in military occupational specialties that do typically deploy to Iraq and Afghanistan, are serving in units stationed in the United States, but have not yet deployed to OIF or OEF.

Conclusions

The Army has provided the bulk of U.S. troops to OIF and OEF: over 1 million troop years as of December 2008. These deployments represent 52 percent of the total troop deployments within the area of operations, and over 75 percent of the deployments on the ground in Iraq, Kuwait, and Afghanistan in 2008.

Since the beginning of OIF, the active-duty soldiers who have deployed have operated at a BOG:Dwell ratio of approximately 1:1. Almost 67 percent of the soldiers in the Army in December 2008 had deployed to Iraq and Afghanistan. Most of these soldiers were working on their second or third year of cumulative deployed duty.

Most of the remaining soldiers (about 20 percent) were new to the Army and still engaged in individual, collective, or unit training. Of the remainder, 7 percent are in key specialties supporting current operations or are deployed to Korea or Europe. Therefore, the active-duty Army is almost completely (about 94 percent) utilized and therefore retains very little unutilized capacity to deploy additional active-duty soldiers.

Acknowledgments

Abbreviations

AC	Active Component
AOR	Area of Responsibility
Bde	Brigade
BOG	Boots on Ground
CBRNE	Chemical, biological, radiological, nuclear, and explosive
CCMRF	CBRNE Consequence Management Response Force
CONUS	Continental United States
CTS	Contingency Tracking System
DMDC	Defense Manpower Data Center
DMRR	Defense Manpower Requirements Reports
DoD	Department of Defense
DRB	Division Ready Brigade
FY	Fiscal Year
GRF	Global Response Force
ID	Infantry Division
IET	Initial entry training
MEDCOM	Medical Command
MFO	Multinational Force and Observers
MI	Military Intelligence
MOS	Military Occupational Specialty
MTOE	Modified Table of Organization and Equipment
MTT	Mobile training team
NMD	National Missile Defense
NTC	National Training Center
OEF	Operation Enduring Freedom

OIF	Operation Iraqi Freedom
OSD	Office of the Secretary of Defense
QDR	Quadrennial Defense Review
TAMD	Theater Air and Missile Defense
TDA	Table of Distribution and Allowances
TRADOC	Training and Doctrine Command
TTHS	Trainees, Transients, Holdees, and Students
USAF	U.S. Air Force
USAFMSA	U.S. Army Force Management Support Activity
USD(P&R)	Under Secretary of Defense for Personnel and Readiness
USMA	U.S. Military Academy
USMC	U.S. Marine Corps
USSOCOM	U.S. Special Operations Command
WTU(s)	Warrior Transition Unit(s)

1. Introduction

In October 2008, the Vice Chief of Staff of the U.S. Army asked RAND Arroyo Center to assess the sources of stress upon the Army given the ongoing deployments of soldiers to operations in Iraq and Afghanistan. Arroyo conducted the analyses documented here to give the Army and other policymakers a fresh look at Army deployments. In this analysis we assessed the magnitude of soldier deployments to Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF), along with the capacity of the Army to sustain these deployments.[1]

Purpose

The purpose of this analysis is to address three broad questions:

1. How many soldiers has the Army been asked to maintain in theater over the course of OEF and OIF? How does this demand for soldiers compare with the numbers of troops maintained in theater by the other services?
2. How does the demand for soldiers translate into a rate of soldiers deployed? What has the Army done to reduce the individual deployment ratio by increasing the number of soldiers it can deploy?
3. Of the soldiers on active duty today, how many have deployed? How many have not yet deployed, and for what reasons?

Data Sources

The main source of data for this analysis is the Defense Manpower Data Center (DMDC). All of the deployment data in this analysis were drawn from

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[1] Additional analyses are under way within RAND Arroyo Center to explore other aspects of the sources of stress upon the Army.

the DMDC database that tracks uniformed military personnel who have received hostile fire pay in Iraq, Afghanistan, the broader theaters supporting these wars, and operations in other regions associated with Operation Enduring Freedom. These data sets represent the most comprehensive sources for deployment histories of the four services. In addition, by using this source, we ensured that our data would be consistent with those used by the DMDC in their own analyses.[2]

Some features of this database merit description before proceeding with our analysis. First, a deployment for OEF/OIF is defined as "a DoD Service member who is or has been *physically located* within the OEF/OIF combat zones or areas of operation (AOR), or has been *specifically identified* by his/her service as 'directly supporting' the OEF/OIF mission outside the designated combat zone (e.g., U.S. Air Force aircrew or support personnel located at an airbase outside the combat zone)."[3] These soldiers, sailors, airmen, or marines are either identified by their services, or identified through Defense Finance and Accounting Service pay records as described below.

Typically, the deployment "clock" for soldiers begins once they "swipe" their identification cards upon arrival on the ground within the AOR. This begins their eligibility for hostile fire or imminent danger pay for the month in which they arrive. The deployment clock for sailors, airmen, and marines serving on the ground also begins with their arrival on the ground in the AOR. However, sailors and marines serving onboard ships begin their deployment when those ships pass within the sea areas designated as hostile fire or imminent danger pay areas. Similarly, aircrew members begin their eligibility for hostile fire/imminent danger pay once their aircraft enter the designated airspace. Therefore, sailors, airmen, and marines counted as deployed in the

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[2] Please see the appendix for a description of the DMDC database used.

[3] Michelle Rudolph, Defense Manpower Data Center, prepared for the 10th Annual Force Health Protection Conference, 4–10 August 2007. See the appendix for additional details regarding the CTS database.

DMDC database may not have served on the ground in Iraq and Afghanistan if they were counted while on aircraft or ships serving in the designated airspace and sea areas. Also, soldiers, sailors, airmen, and marines serving in other designated land areas within the AOR would be counted as deployed regardless of whether they entered Iraq or Afghanistan during their deployments. Finally, some troops—for example, airmen serving on a base outside of the combat zone—are included within the deployment count if their services described their duties as direct support to OEF/OIF.

Troops from each of the services are entitled to the entire monthly hostile fire/imminent danger pay amount regardless of how many days in that month they actually spend in theater. They will, therefore, appear within a monthly count whether they spend one day or the entire month within the AOR. Note, however, that only those troops earning this pay in those areas associated with OIF or OEF are counted as deployed within this DMDC database.

The DMDC counts troops still on active duty for that month. For the Army, the active-duty numbers include approximately 541,000 active component soldiers and nearly 16,000 Army Reserve soldiers on Title 10 active guard and reserve (AGR) status as of December 2008. These numbers are a snapshot in time: For example, a soldier with credited deployment time who leaves the Army on November 30, 2008 will not be included in the December 31, 2008 data. However, soldiers joining the Army on December 1, 2008 (with no deployment time) are included. Therefore, the DMDC data only include as deployed those who have served in OEF or OIF and are still in the Army as of the date published.

OEF/OIF Designated Hostile Fire Pay/ Imminent Danger Pay Zones

The operating areas designated by the DoD for hostile fire pay/imminent danger pay and associated with OIF/OEF include the following:[4]

Afghanistan
Arabian Peninsula, including:

- Bahrain
- Kuwait
- Oman
- Qatar
- Saudi Arabia

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[4] DoD Financial Management Regulation 7000.14-R, Volume 7A, Chapter 10, Under Secretary of Defense (Comptroller), May 9, 2009. As of November 26, 2009: http://comptroller.defense.gov/FMR

- UAE
- Yemen

Djibouti

Iraq

Kyrgyzstan

Uzbekistan

The surface area of the sea boundaries:

- Red Sea
- Gulf of Aden
- Gulf of Oman
- Arabian Sea north of 10°N latitude and west of 68°E longitude

The airspace over these areas.

2. Demand for Troops in Operation Iraqi Freedom and Operation Enduring Freedom
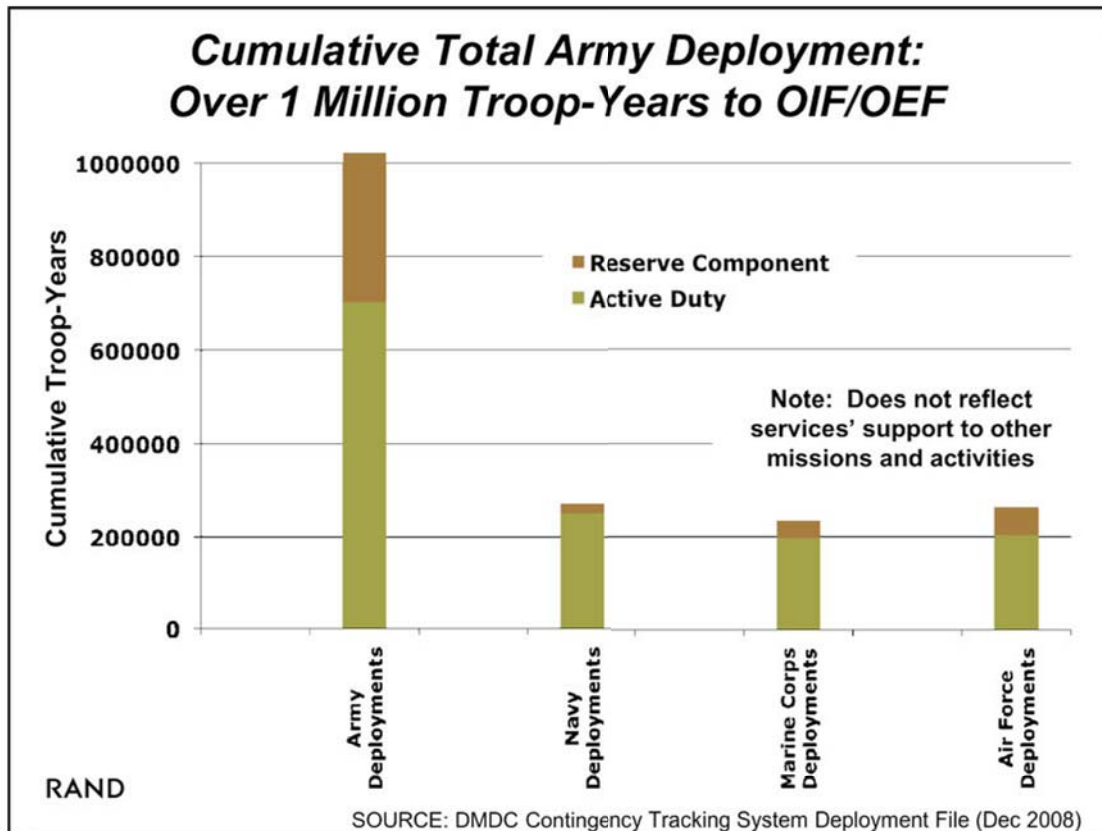
Cumulative Troop-Years Contributed to OIF and OEF

To begin, we assessed overall demand for troops to support OIF and OEF. Our proxy for demand was the troops provided by the military services, as shown in the figure above. (In fact, the combatant commanders and their subordinate commanders have at times requested more. Therefore, troops provided may actually understate total demand, because of limited supply and other demands for troops worldwide.)

We use cumulative troop-years deployed to measure personnel committed to OIF and OEF by the Army, Navy, Marine Corps, and Air Force. For each

service, the olive-green bar represents troops deployed from that service's active component and the brown bar represents troops deployed from the reserve components. These bars include personnel on the ground in Iraq and Afghanistan and those supporting these operations from ships, aircraft, and bases in the respective theaters. The DMDC database we used does not count as deployed troops in other theaters such as Korea, Europe, MFO Egypt, at sea, or in other parts of the world.

The largest portion of DoD's cumulative troop-years were provided by the Army, and both its active and reserve deployments are much higher than those of the other services. While not surprising in a predominantly ground operation, it does underscore the demands placed upon soldiers. In 2008 the Army passed a significant milestone: 1 million troop-years deployed.[1]

(As shown on the prior chart, the Army Reserve and Army National Guard contribute a significant number of the Army's troops. A detailed assessment is needed to determine how many more soldiers the Army National Guard could potentially provide given their current support to operations at home and abroad, as well as their other state and national responsibilities. A similar assessment is needed for the U.S. Army Reserve. Future updates to this report will include assessments of the Army reserve components.)

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[1] Total of all Army active-duty and mobilized reserve component soldiers who have served time in OIF or OEF since the beginning of these conflicts. This includes soldiers who have subsequently left the service.
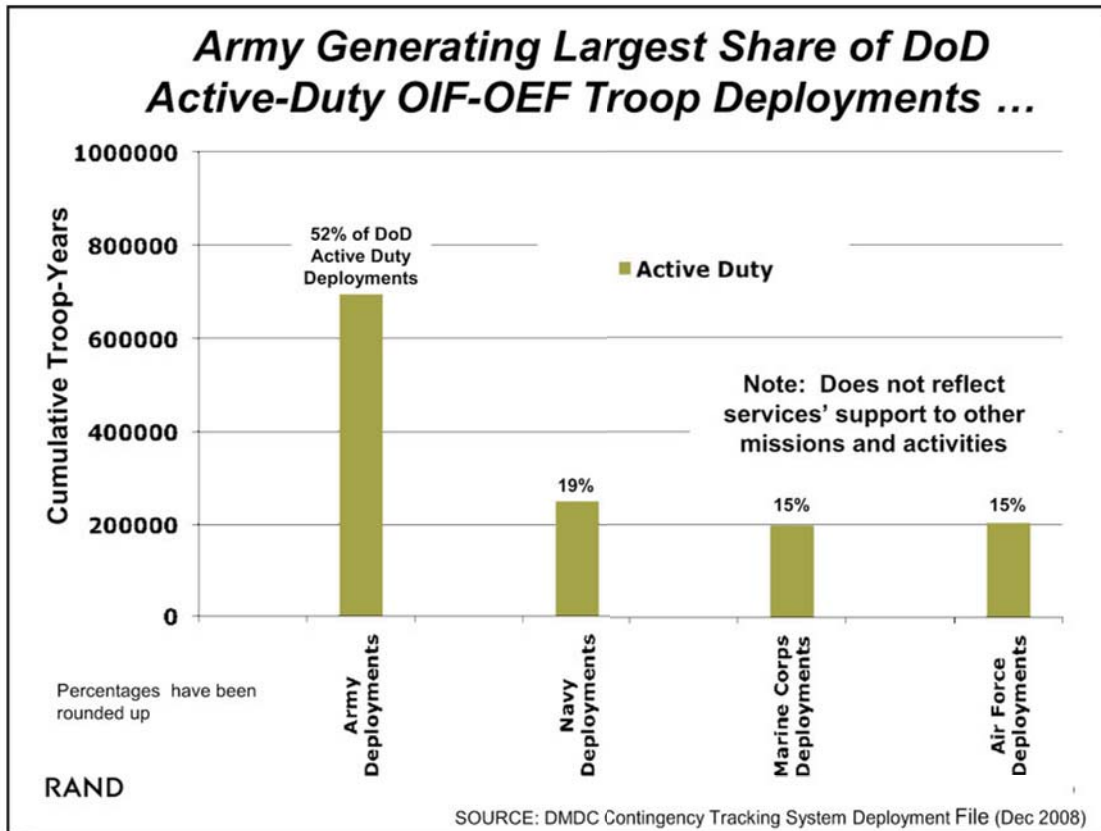
Active-Duty Troop-Years Deployed

The figure above shows the cumulative deployment of active-duty troops to Iraq and Afghanistan from across all four services. Fifty-two percent of the cumulative active-duty troop-years deployed to Iraq and Afghanistan have been contributed by the Army. As we will discuss in more detail below, the portion of deployed Department of Defense (DoD) active-duty troops represented by soldiers is higher than the Army's share of total DoD active-duty troops.

It is important to note that each of the services also supports other missions not included in the DMDC data as "deployed." (Recall that the definition of "deployed" in the DMDC database is limited to troops in the OIF and OEF areas of operation, and those who have received hostile fire pay in connection with other aspects of OEF.) Troops from each of the services serving in Korea, Kosovo, MFO Egypt, at sea, and in other theaters are not counted.

For the remainder of this document we will focus on the active-duty Army troops deployed, determine how busy they are, assess steps taken by the Army to increase its active-duty capacity, and determine whether the Army could provide even more.

... In Total and as a Percentage of FY2008 DoD Active-Duty Assigned Strength

Note: Does not reflect services' support to other missions and activities

Percentages have been rounded up

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SOURCE: DMDC Contingency Tracking System Deployment File (Dec 2008)
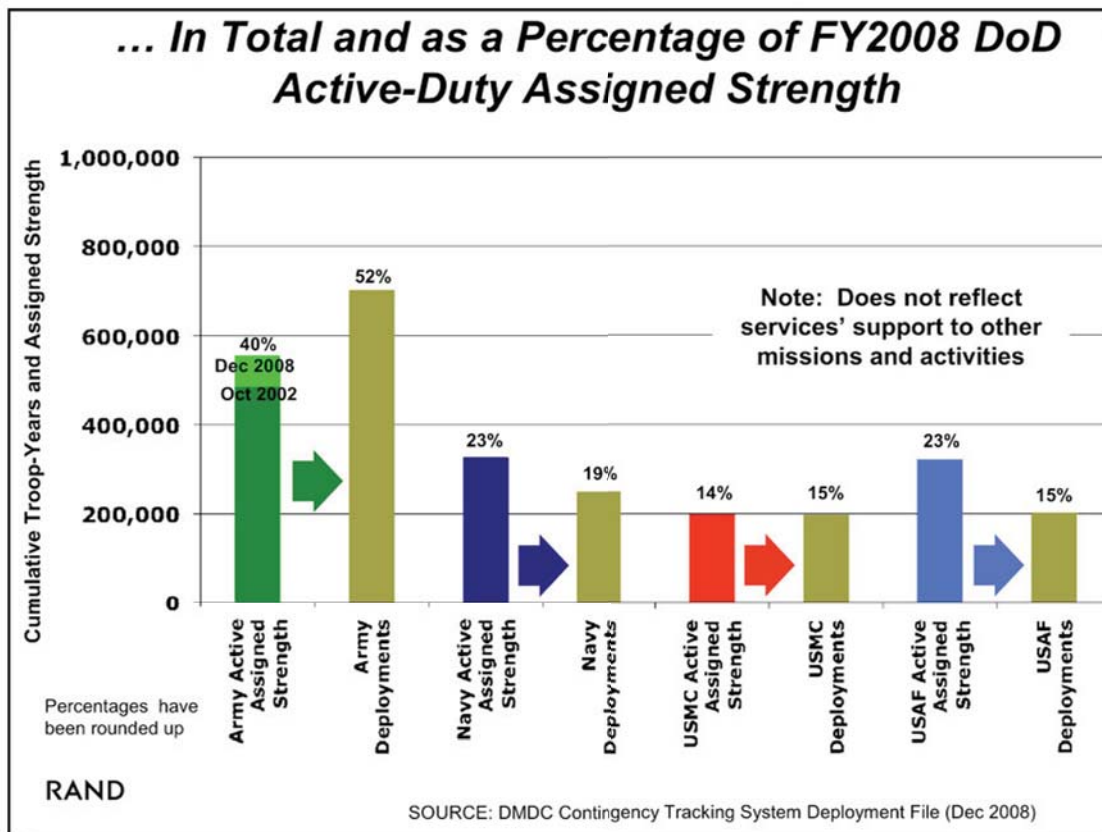
Active-Duty Assigned Strength Supporting Cumulative Deployments

As a benchmark, it is interesting to note how the size of each service—measured in numbers of active-duty assigned troops in 2008—compares with the cumulative number of active-duty troops deployed to OIF and OEF. (Active-duty strength equals the sum of active component end strength, and those Army Reserve soldiers on full-time active-duty status—as distinct from mobilized reservists.)

The war in Afghanistan began in early FY2002, and the buildup of forces for Operation Iraqi Freedom began at the end of that same year. The FY2002

end strength was 487,000 soldiers (the dark green bar in the figure above).[2] In December 2008, the Army active-duty strength reported by DMDC had grown to 557,000 soldiers (shown by the light green bar).

The Army represented 40 percent of the DoD's active-duty strength in 2008, but had contributed 52 percent of the active-duty troop-years to Iraq and Afghanistan. This indicates that the Army is flowing a much higher proportion of its active-duty strength to the ongoing wars than the other services.

(As shown in the figure above, the Army was at its greatest size in 2008— representing 40 percent of the total DoD active-duty end strength. In 2002 the Army was smaller, and represented only 35 percent of DoD active-duty end strength.)

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[2] For comparison, FY2001 Army end strength was 481,000 soldiers. However, the large demands on soldier deployments began in 2002 as Army forces were deployed for OIF. Therefore, we have focused upon FY2002 end strength because it represents Army active-duty soldiers on hand at the beginning of OIF.
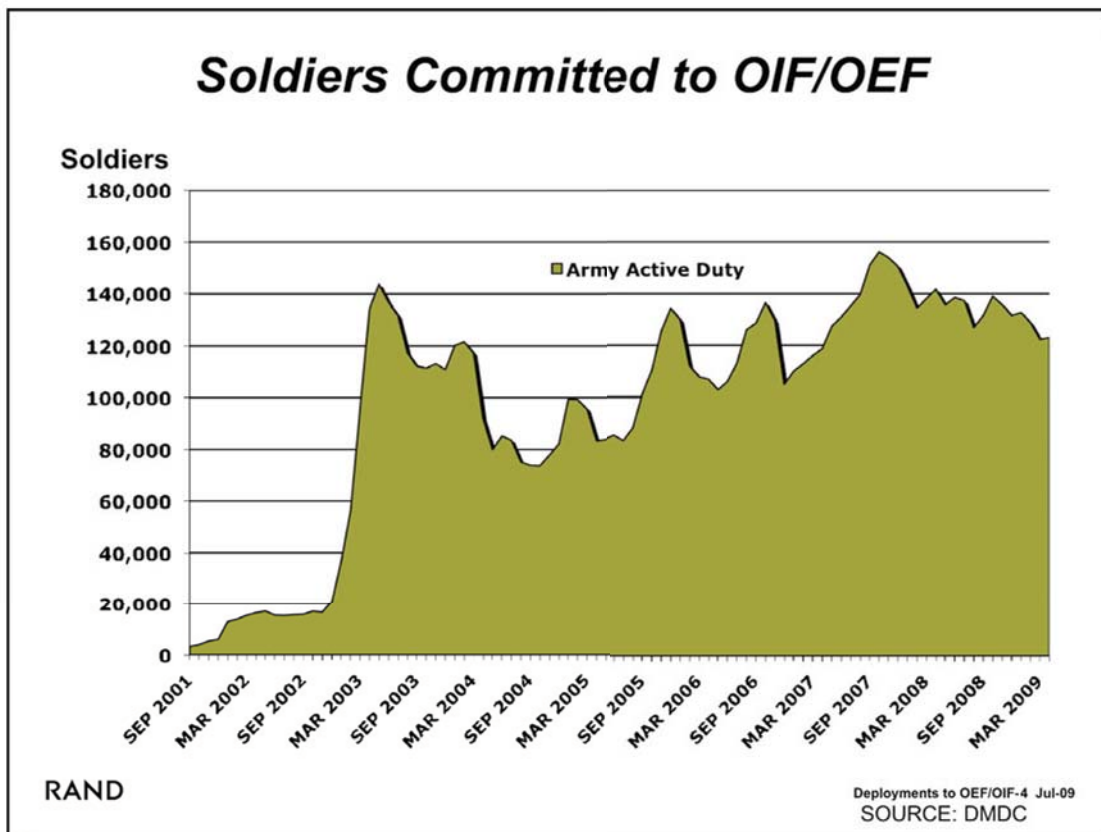
Yearly Demand for Active-Duty Soldiers

The figure above shows how many Army active-duty soldiers were deployed to Iraq and Afghanistan for each month from September 2001 through April 2009. Three interesting features to note:

1. The monthly troop counts were fairly low when the war was confined to Afghanistan (less than 20,000 active-duty soldiers each month). When troops were massed for Operation Iraqi Freedom, the count rose significantly, reaching ~144,000 in May 2003.

2. Active-duty troop counts declined in the middle of 2004 as the total size of the force in Iraq was reduced and the reserve components took a larger share of the load. (The active-duty units returning to the United States used this time to convert to the new modular unit design. They then redeployed to Iraq or Afghanistan as

"modularized" combat or functional brigades.) Active-duty soldier numbers did not reach 100,000 again until September 2005.

3. After September 2005, active-duty soldier deployments never fell below 100,000. The average monthly number of active-duty soldiers from the period September 2005 through April 2009 was 128,000. The average number of soldiers deployed from March 2003 through April 2009 was 117,000.
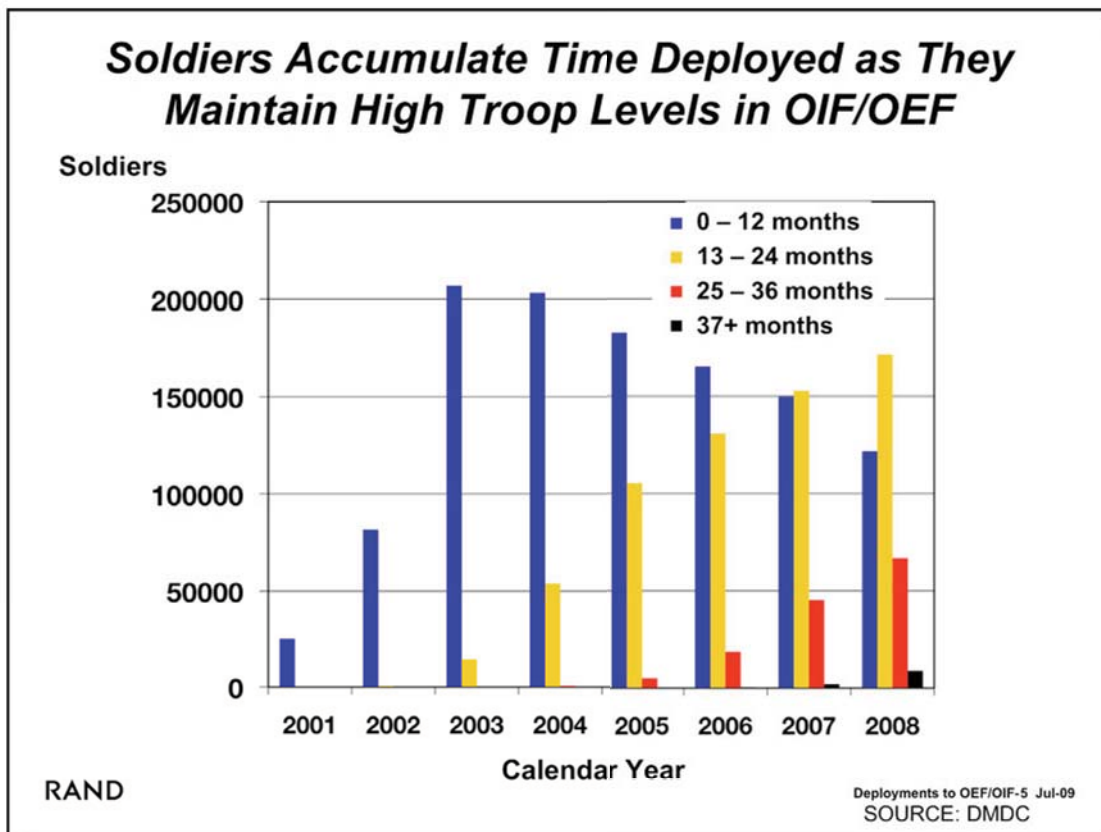
The Army's Cumulative Deployed Contribution Increased Steadily as Soldiers Returned to Theater for Repeated Deployments

It is interesting to see how the cumulative deployed time for soldiers has grown as the wars in Iraq and Afghanistan have progressed. The figure above shows total cumulative time deployed for active-duty soldiers at the end of December for 2001 through 2008. The blue bars show soldiers in their first year of deployment for each year. These bars began at 25,000 soldiers in December 2001 and peaked at 207,000 soldiers in December 2003. By December 2008, the number of soldiers on their first deployments had dropped to 121,000 as more and more soldiers were completing their second or third year of deployed duty.

The number of soldiers completing their second year of duty is shown by the yellow bars. They exceeded first-year soldiers for the first time in December

2007 (153,000 soldiers in year 2 versus 150,000 soldiers in year 1). In December 2008 the second-year soldier numbers reached more than 172,000.

Soldiers in their third year of deployment reached 69,000 in December 2008, and soldiers in their fourth year of deployment reached 13,000.

In general, it takes two or more years of service to generate a year of time deployed. Therefore, about every two years a group of soldiers begins another year of deployed duty. That is, the soldiers beginning their second year in 2003 are largely the soldiers beginning their first year in 2001; these soldiers then began their third year in 2005, and their fourth year in 2007 or 2008.

Significant Number of Soldiers Entering Their Third Year of Cumulative Deployed Time
(As of December 2008)
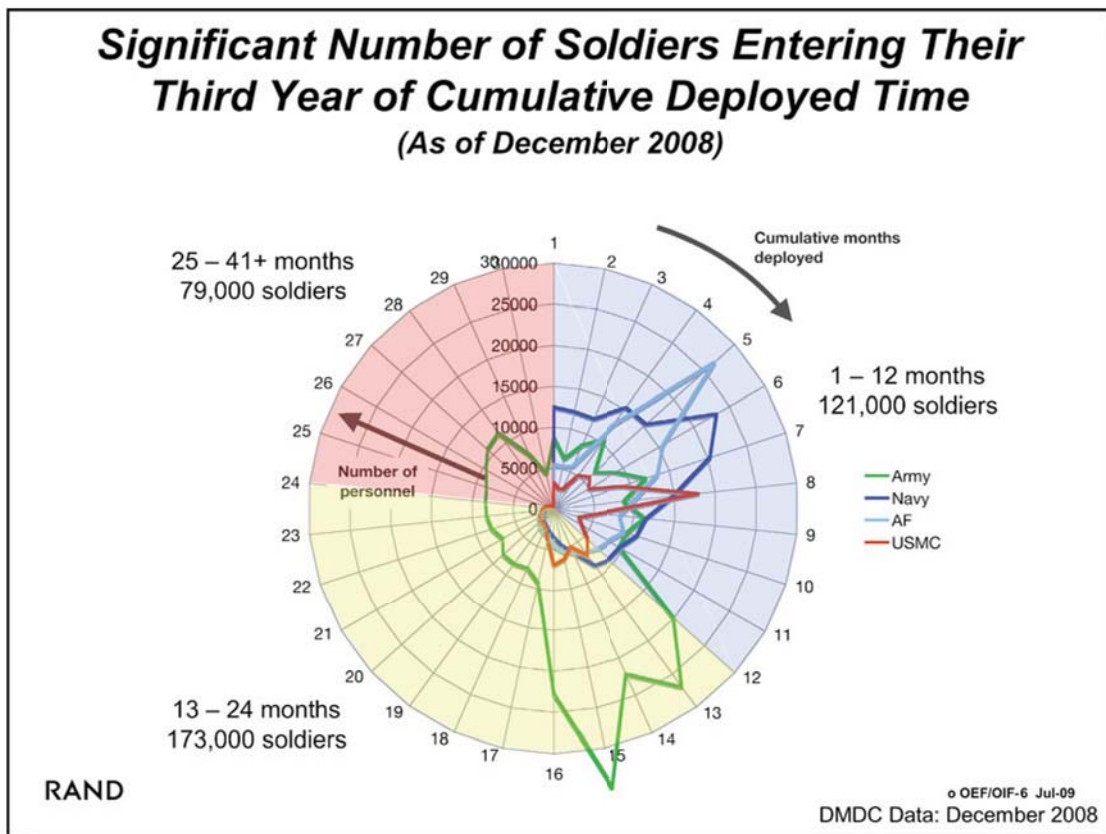
Cumulative Soldier Time Deployed Exceeds Cumulative Deployed Time of Other Services

This chart reflects the cumulative deployments for each service as of December 2008. The numbers around the outside circle (proceeding in a clockwise direction) depict cumulative months deployed, and the rings (moving outward in a radial direction) depict the number of service members who have been deployed for that period of time. For example, 27,000 soldiers had a cumulative deployment time of 13 months, 23,000 soldiers had 14 months, and 35,000 soldiers had accumulated 15 months of deployed time.

Of particular note are the 173,000 soldiers working on their second year of deployed time and the 79,000 soldiers working on their third year—or longer—of deployed time. (Including roughly 9,000 soldiers in their 4th year of deployed time.) For the purpose of comparison, deployments by service are given below:

Table 1
Army Deployments to OIF and OEF

	Army	Navy	Air Force	USMC
Not yet deployed (troops)	184,531	123,148	151,083	84,076
Not yet deployed (percantage)	33%	38%	46%	42%
Beginning, accumulating, or completed				
1st year of deployed duty	121,200	166,771	127,716	69,387
2nd year of deployed duty	172,925	34,267	40,760	42,021
3rd year of deployed duty	68,896	2,846	49,76	4,141
4th year of deployed duty	9,187	710	714	396
Total:	556,829	327,742	325,249	200,021

Please note that the numbers in the row "1st year of deployed duty" reflect all active-duty soldiers, sailors, airmen, and marines in some stage of beginning or completing one cumulative year of deployed duty. This category includes everything from personnel who have visited the theater for a short period one or more times to those with 365 days of continuous deployed duty. (The previous "tachometer" chart, in contrast, better reflects the distribution of accumulated time.) Similarly, the "2nd, 3rd, and 4th year" rows reflect the number of active-duty troops at some point of completing two, three, or four years of duty, respectively, in OIF or OEF.

Bulk of Deployment Burden Falls on Mid-Grade Soldiers — And Junior Soldiers Starting Out
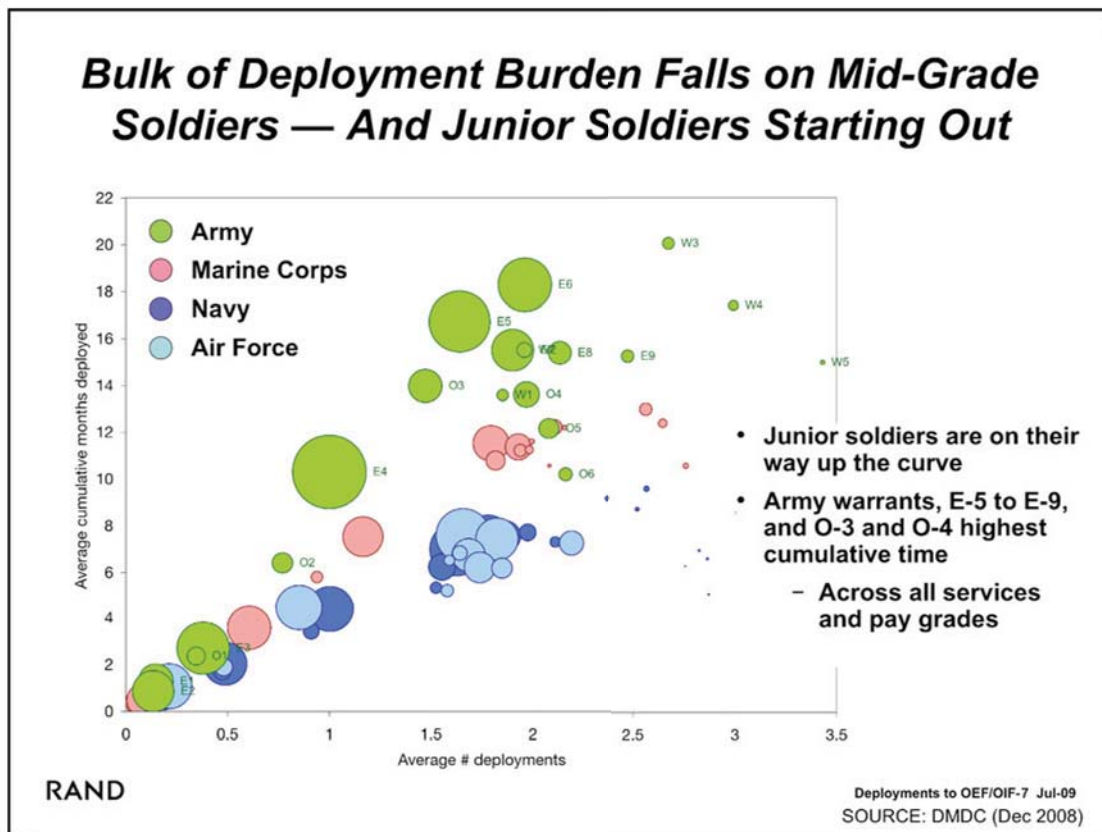
Deployment Burden Falls Most Heavily on the Army's Warrants, Noncommissioned Officers, and the Middle Ranks of Officers

It is also interesting to see where the burden falls by grade for each service. The figure above shows how often soldiers of each grade or rank are deployed. The horizontal axis shows average number of deployments at each grade, and the vertical axis shows average cumulative months deployed since 2001. In other words, the troops at the top of this figure have more average months deployed, while troops toward the right-hand side have the greatest number of deployments. For example, Army E-6 noncommissioned officers, on average, had completed two deployments and, on average, had over 18 months of cumulative deployed time.

The size of the bubbles represents the relative size of each population. So, Army E-4s were the single largest population in this data series.

In general Army soldiers are deploying as frequently as, or more frequently than, their counterparts in the other services and hence have more cumulative deployment experience. This is evident in the pay grade comparisons as well. The Army middle grades—E-4 through E-9, Captains and Majors, and Warrant Officers—had the most deployment experience. In fact, they had more months deployed than any other rank or group of ranks from any of the other services. Warrant officers are especially heavily deployed.

3. Army Deployment Capacity and Soldier Deployment Ratio

2002 Supply: Active Component Soldiers Available to Support Continuing Missions and Contingencies
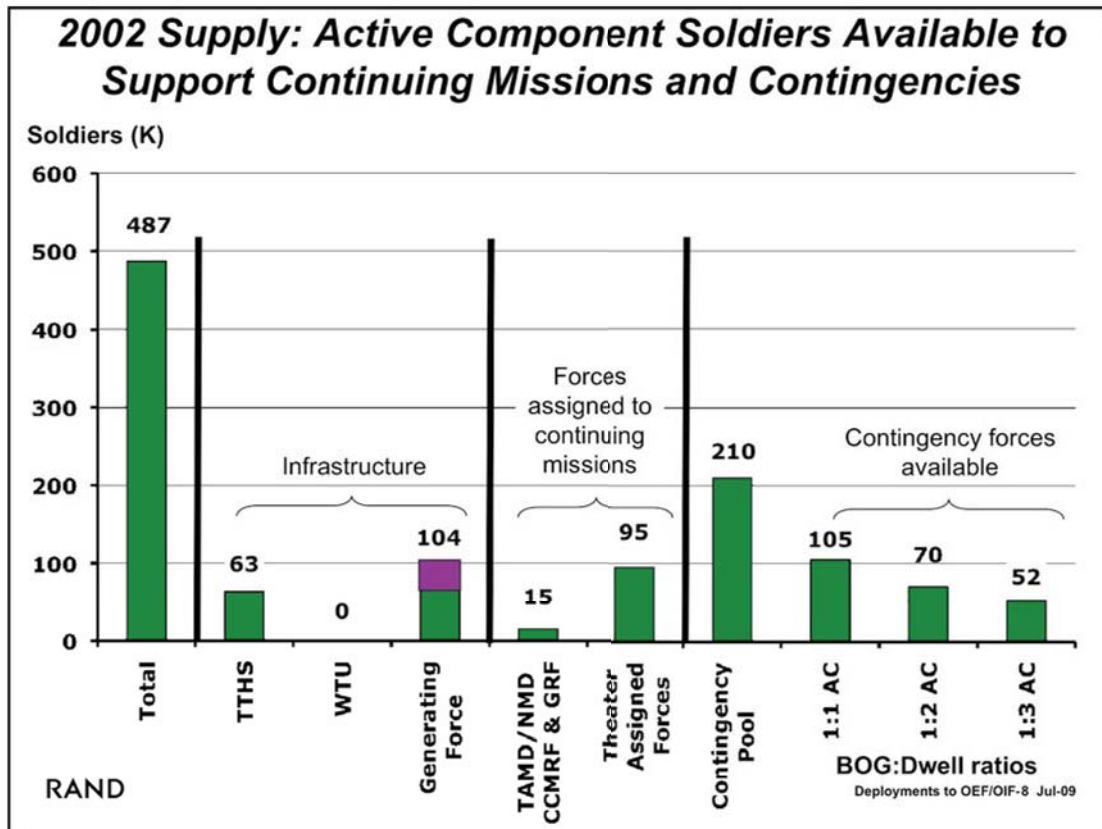
Army Capacity to Support Troop Demands: 2002 End Strength

The Department of Defense Green Book reported Army active-duty strength for FY2002 of 487,000 soldiers. Of these soldiers, the Army reported that 63,000 were in the Army's trainees, transients, holdees, and students (TTHS) account.[1] Another 104,000 soldiers were in the generating force.[2]

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[1] The TTHS account includes all active-duty soldiers on temporary status within the Army.

[2] As we will note below, many of these soldiers are engaged in joint or national duties. The portion of the bar representing these soldiers is colored purple.

In addition, the Army provided 11,000 active-duty soldiers for theater air and missile defense forces and national missile defense, and another 4,000 soldiers for a global response force (or GRF—formerly known as the "division ready brigade" or DRB). The Army also had 95,000 soldiers serving in Korea and Europe.

After accounting for all of these tasks and missions, we estimate that 210,000 soldiers would be available for a notional "contingency pool." Soldiers from this pool could be deployed at alternative "boots on ground" to "dwell" ratios to Iraq, Afghanistan, or other missions. Boots on ground, or BOG, refers to the time that soldiers spend in theater at their deployed locations. "Dwell" is supposed to represent the time that soldiers spend at their home stations. (At home stations soldiers recover and reset mentally and physically from previous deployments, receive new equipment, and train for their next deployment. Therefore, the "dwell" pace can be hectic and the hours spent at work each day very long.)

In fact, however, all of the time not spent in theater (i.e., "Not BOG") is counted as "dwell." That means that "dwell" includes all of the time spent traveling to theater, the time spent traveling home, and the time spent training away from home station (e.g., at the National Training Center—NTC—at Fort Irwin, CA). (Thus, rather than BOG:Dwell, the ratio might better be called BOG:Not BOG.)

A 1:1 BOG:Dwell ratio indicates that a soldier spends one time period (typically a year, and sometimes up to 15 months) in theater, and the same amount of time not in theater (including time at home station, traveling to and from theater, and training) before returning to theater. A 1:2 ratio indicates two time periods away from theater for every time period in theater, and a 1:3 ratio yields three time periods away from theater for every time period in theater. The Army has recently deployed soldiers to Iraq and Afghanistan at ratios of 1:1 or even higher. The Secretary of Defense has set 1:2 as his objective, whereas the Army prefers a sustained BOG:Dwell of 1:3.

(As a comparison, the Navy has expressed the optimal turnaround ratio (i.e., the days in home port for each day on deployment) as 2.7 in order to complete the interdeployment training cycle. This is similar to a BOG:Dwell of 1:3 if the naval forces count the time sailing to and from their operating areas as deployed time. (Since days spent traveling to and from theater are counted as "dwell" by the Army for deploying soldiers.) The Air Force has stated a preference for 120 days of deployment for each Air Expeditionary Task Force within a 20-month cycle. This implies a deployment ratio of 1:5.][3]

At a ratio of 1:1, 105,000 soldiers can be deployed at any given time from a contingency force of 210,000 soldiers. At 1:2, nearly 70,000 soldiers could be deployed; and at 1:3, 52,000 soldiers could be deployed.

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[3] Statement of Vice Admiral Herbert A. Browne, Jr., Commander Third Fleet, before the Readiness, Personnel, and MILCON Subcommittee of the House National Security Committee on Fleet Readiness, September 25, 1998, and the U.S. Air Force Transformation Flight Plan, General John P. Jumper and Dr. James G. Roche, HQ, U.S. Air Force, Washington, D.C., 2004.

Soldiers Committed to OIF/OEF
(Compared with 2002 supply)
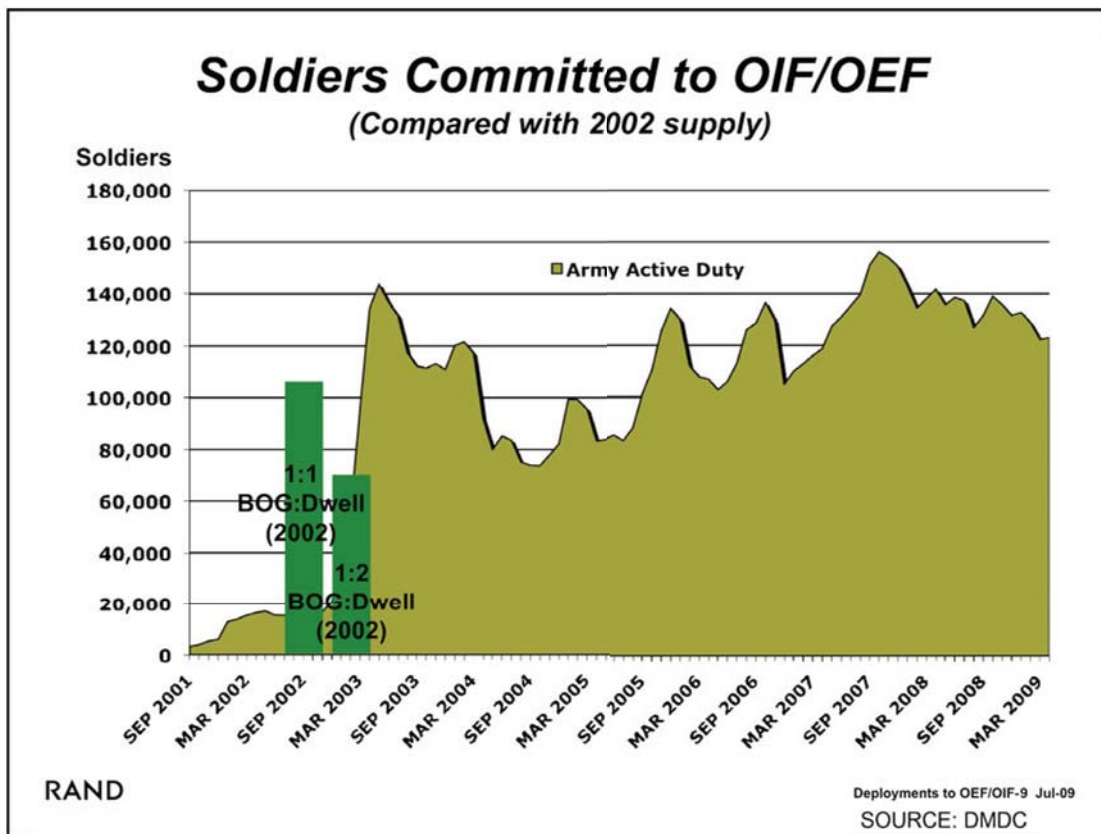
BOG:Dwell Ratio Required to Support Deployment Demands, 2003–2005

This chart shows that the Army as organized and manned in 2002 could have provided 105,000 soldiers at a BOG:Dwell ratio of 1:1 and 70,000 soldiers at 1:2. From March 2003 through March 2004, the Army deployed soldiers in amounts higher than could be sustained by these estimated capacities.

From March 2004 through September 2005, active-duty soldier deployments dropped, and could have been sustained with the capacities estimated at ratios between 1:1 and 1:2. This was made possible through the deployment of an increased number of Army Reserve and Army National Guard soldiers, as shown in the figure below.

After September 2005, active-duty soldier demand exceeded the 2002 amounts estimated to be available at even a 1:1 deployment ratio.

Reserve Component Force Deployments
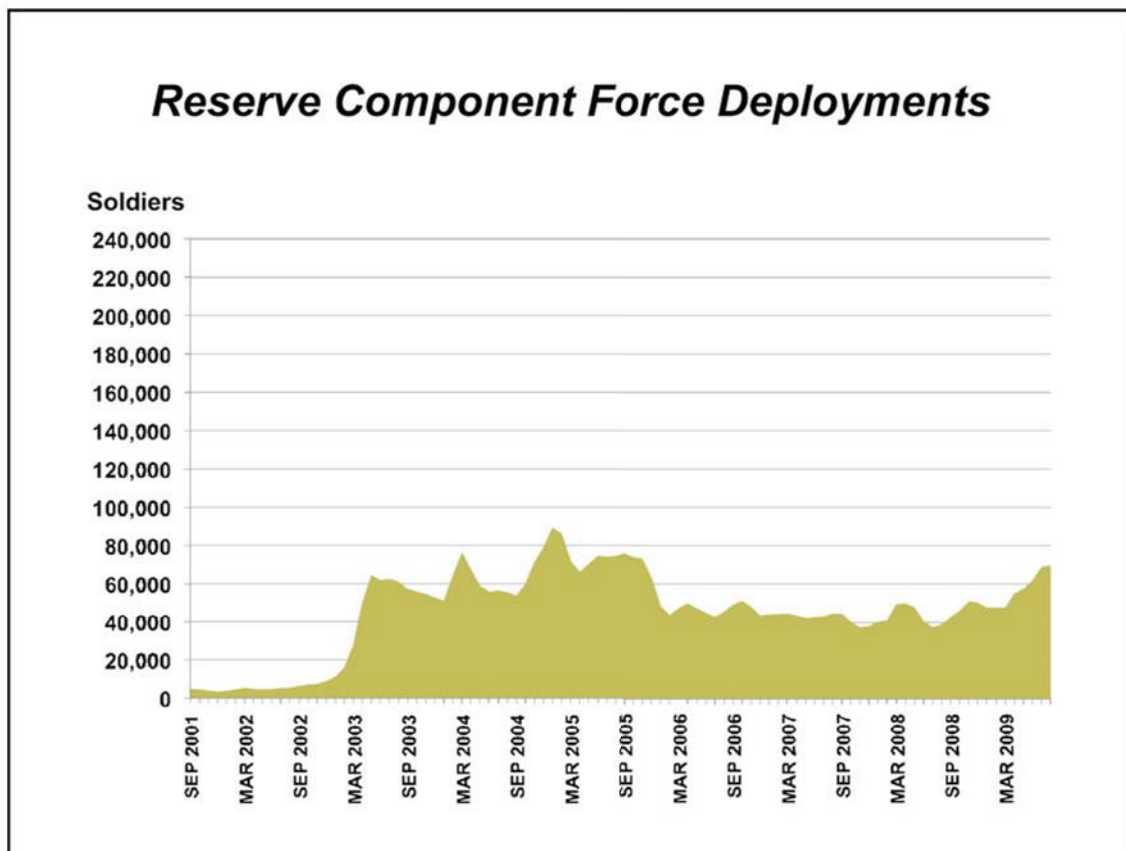
The Army's reserve component deployed significant numbers of soldiers to OIF from its beginning in March 2003. An increase in the numbers of reserve component soldiers in September 2004 allowed the Army to reduce deployments of active-duty soldiers over the following year. (Reserve component soldier deployments then declined to a level around 40,000 for the next 3 years.) Reserve component soldier deployments have increased again in 2009, allowing a similar decrease in active-duty soldier deployments.

2002 Army Had 67% of Troops in Operating Forces
(FY2002 OSD estimate)

Legend:
- Forces
- Infrastructure

Chart data (Troops (K)):
- Army: Forces 67%, Infrastructure 33%
- Navy: Forces 56%, Infrastructure 44%
- Marine Corps: Forces 69%, Infrastructure 31%
- Air Force: Forces 52%, Infrastructure 44%

RAND

Deployments to OEF/OIF-10 Jul-09

SOURCE: Defense Manpower Requirements Report, FY2009, ODUSD(PI)(RQ)
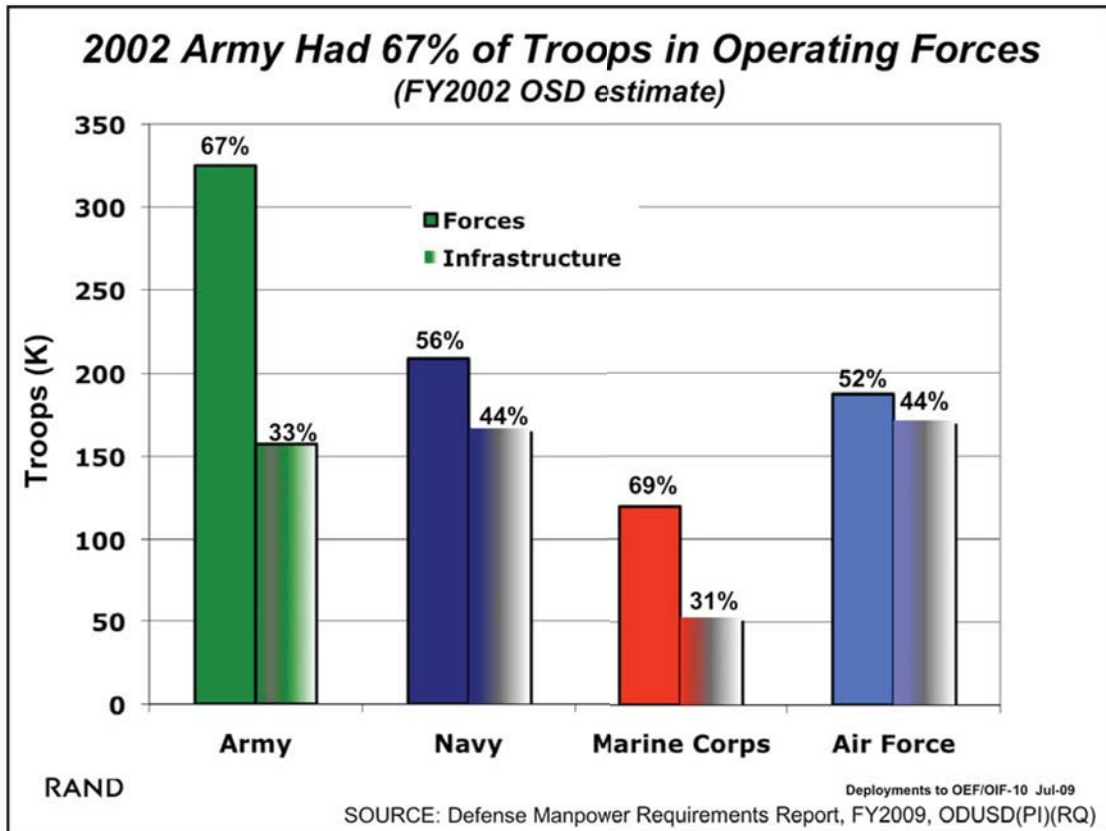
Soldiers Assigned to "Infrastructure" and "Forces"

Over the course of operations in Iraq, the DoD and the Army took several steps to increase the number of soldiers available for deployment. First, the DoD sought authority to increase Army end strength. Army active-duty end strength increased from 487,000 in FY2002 to an active-duty strength of 557,000 soldiers in December 2008. The Army also took steps to shift soldiers into operational assignments from other jobs in the Army.

The Defense Manpower Requirements Report provides estimates of the numbers of troops used by the services in "infrastructure" activities, and the numbers of troops available as "forces." For the Army, the 2002 infrastructure estimate (contained within the FY2003 report) included 63,000 soldiers that the Army had planned for its TTHS account and slightly more than 94,000 soldiers in the generating force. The operating force was projected to have 325,000 soldiers, for a total end strength of 482,000 soldiers. (The Army later

reported 104,000 soldiers in the generating force and an actual FY2002 end strength of 487,000 soldiers.)

As shown in the figure above, the FY2002 plan resulted in two-thirds of the active-duty soldiers in the operating forces, and one-third of the soldiers in the infrastructure accounts. The proportion of operating forces for the Navy and Air Force was higher than that planned, and somewhat lower for the Marine Corps than planned.

(However, we should note that the Marine Corps does receive some infrastructure support from the Navy and the Army. For example, Navy offices provide support to Marine Corps acquisition activities. In addition, much ground combat and combat support training is provided at Army-operated facilities. These include training in artillery, armor, engineer, military police, and some other tasks.)

2008 Army Increased Operating Forces to 71%
(FY2008 OSD estimate)

SOURCE: Defense Manpower Requirements Report, FY2009, ODUSD(PI)(RQ)
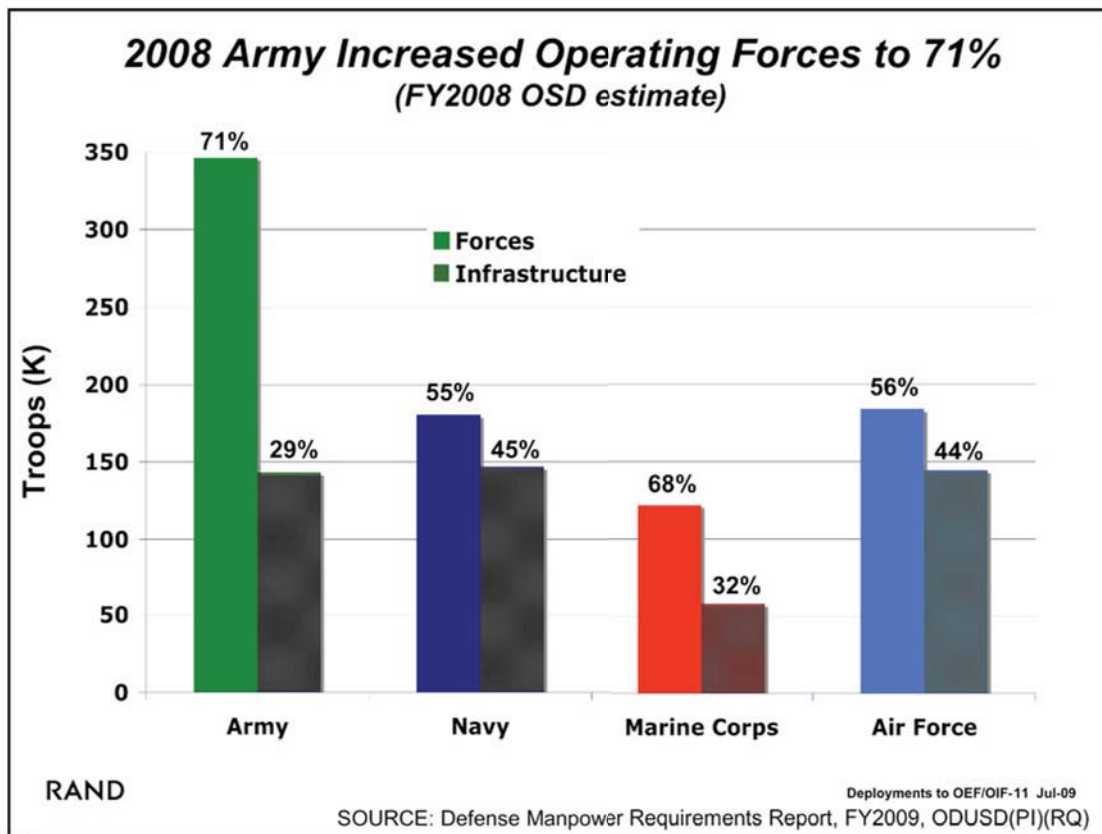
Soldiers Moved from "Infrastructure" to "Forces"

By FY2008, the Army's proportions had changed, as shown in the figure above. The 2008 estimate (contained within the FY2009 report) included 80,000 troops that the Army planned for its generating force, and 63,000 soldiers that the Army had planned for its TTHS account. (The original FY2008 estimate included a planned end strength of 489,000 soldiers. The actual active-duty strength reported by DMDC at the end of December 2008 was 557,000 soldiers. The higher strength included soldiers affected by stop-loss, those added as part of a 65,000 soldier permanent end strength increase, and Army Reserve soldiers on full-time active duty.)

When compared to the other services, the Army planned to run its "infrastructure" activities with many fewer uniformed personnel as a percentage

of its total end strength.[4] In all, the Army planned in 2008 to have 29 percent of its force invested in infrastructure activities. An interesting comparison might be made with the Navy—which planned to have 45 percent of its uniformed personnel devoted to infrastructure activities. It is worth noting that the Navy has historically maintained a rotational force structure and may through long experience have arrived at a sustainable ratio of "forces" to "infrastructure." If so, it may be that the Army has attempted to reduce the uniformed portion of its "infrastructure" to a level that cannot sustain a world-class Army.

Also, the Army counts all Table of Distribution and Allowances (TDA) soldiers as part of its generating force. However, about half of these soldiers have roles apart from, or in addition to, what we would consider purely Title 10 roles ("organize, train, and equip the Army") as shown below:

Table 2
Army Joint Activities and National Missions

Joint Activities and National Missions	
Army Operations Center	300
Theater Assigned	2,216
Support to USSOCOM	101
Strategic Intelligence	2,244
Criminal Investigation Command	732
Army Corps of Engineers	408
Assigned to Joint Duty	8,086
Translators, Joint MTT Training	2,339
Signals and Network Commands	180
MEDCOM	23,133
Military District of Washington	500
Asymmetric Warfare Office	223
Total	40,462

SOURCE: 2008 USAFMSA data.

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[4] To some degree it is difficult to compare the Army with the Navy and Air Force due to their differing roles, equipment, and infrastructure functions. However, the other services have used a rotational forces structure before the Army—making these comparisons potentially useful.

These soldiers engaged in the following joint activities and national missions:

1. Army Operations Center: manages Army direct support to contingencies.
2. Theater assigned: TDA organizations assigned to Army Component Commands for theater-related duties.
3. Support to U.S. Special Operations Command.
4. Strategic Intelligence: support to Intelligence Community, including 704th MI Brigade.
5. Criminal investigation duty for uniformed military.
6. Army Corps of Engineers: national infrastructure and services support.
7. Joint duty officers and enlisted personnel, assigned to combatant commands, the joint staff, etc.
8. Translators supporting deployed operations and the 1st Bde, 1st ID (replaced by 162nd Bde) tasked to train joint military training teams.
9. Strategic signals and computer network defense.
10. Army Medical Command: provide health services to troops and military medical beneficiary community.
11. Military District of Washington: ceremonial and security duties.
12. Asymmetric Warfare Office: develop operational concepts to defeat enemy irregular warfare operations.

In all, fully half of the soldiers counted as being in the Army's generating force are occupied some or all of the time in duties other than organizing, training, and equipping Army forces.

2008 Supply: Active Component Soldiers Available to Support Continuing Missions and Contingencies
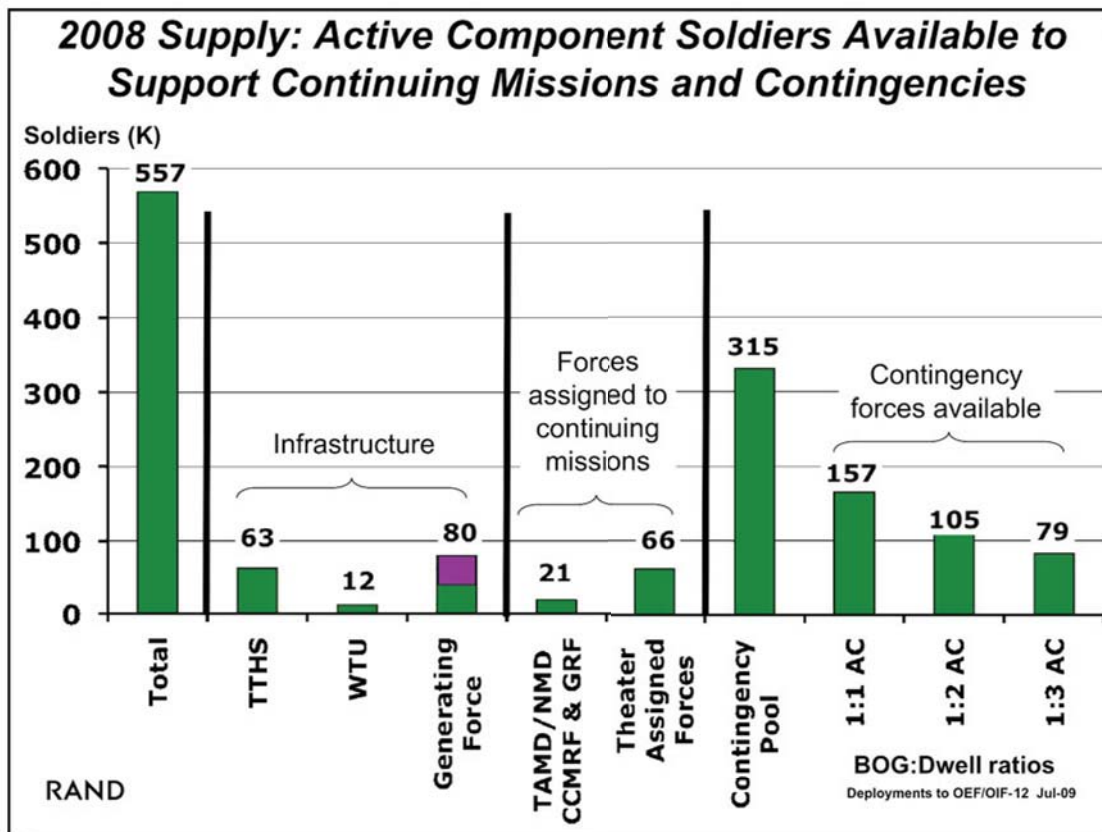
DoD Increased Army End Strength and Changed Other Demands

DMDC reported an increase in Army active-duty strength to 557,000 soldiers in December 2008. Of these soldiers, the Army planned to have 63,000 in the TTHS accounts and 80,000 in the generating force. In addition, 12,000 were assigned to warrior transition units as of January 2009.[5]

The Army continued to provide 11,000 soldiers for theater air and missile defense forces and national missile defense, and 4,000 soldiers for the GRF. More recently the Army has been tasked to provide an active-component brigade and supporting units as part of the chemical, biological, radiological,

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[5] Soldiers are assigned to warrior transition units (WTUs) when they have been wounded or otherwise injured and are not able to conduct their normal duties. Of the 12,000 in WTUs as of January 2009, 9,000 were veterans of OIF or OEF. The other 3,000 injured have not yet deployed to OIF or OEF.

nuclear, and explosive (CBRNE) consequence management response force (CCMRF). Each CCMRF is projected to comprise a total of 6,000 soldiers. Together these tasks may occupy up to 21,000 active-duty soldiers. In addition, the Army has assigned 66,000 soldiers to serve on foreign soil in Korea, Europe, and other overseas duty stations.[6]

This results in a notional contingency pool of 315,000 soldiers, able to provide 157,000 soldiers at a BOG:Dwell of 1:1 and 105,000 at 1:2. Additional soldiers could be (and, it appears, have been) borrowed from the CCMRF, missile defense forces, or theater assigned forces. In theory, these 87,000 soldiers could be added to the contingency pool if the Army were relieved of these missions and the obligation to provide a GRF.

In an important sense, these estimates reflect an optimistic case and ignore real-life factors that may reduce the number of soldiers available in practice. First, there exists an additional "friction" in the system not explicitly treated here. Each time a unit is ordered to deploy, some number of soldiers are not available when the unit is due to ship out. These soldiers may not be cleared to deploy due to unresolved medical issues, because they need additional training, because they had not yet accumulated 12 months between deployments, or for other extenuating reasons. The Army has reported that these numbers can be as high as 10 percent of a unit's strength. Many of these soldiers do subsequently deploy "late" to meet with their units. Future work will explicitly treat the effects of this friction.

Second, this analysis treats every soldier as fungible with any other. In fact, soldiers have different military occupational specialties (MOSs), and grades (i.e., rank), are organized into different types of units and echelons and are trained for specific missions. These dimensions exist for an important reason: to ensure that soldiers with the right training, expertise, experience and

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[6] In total, 66,000 soldiers were permanently stationed overseas in 2008. This is a significant reduction from the 95,000 soldiers stationed in overseas posts in 2002.

leadership qualities, organization and operational concepts, and mission training are available for a wide scope of possible missions and tasks. These dimensions were created to meet a detailed and varied demand for ground capabilities. Any of these factors can be changed—and have been over the course of OEF and OIF—but the process takes time and may present additional constraints upon the number of soldiers available at any given moment.
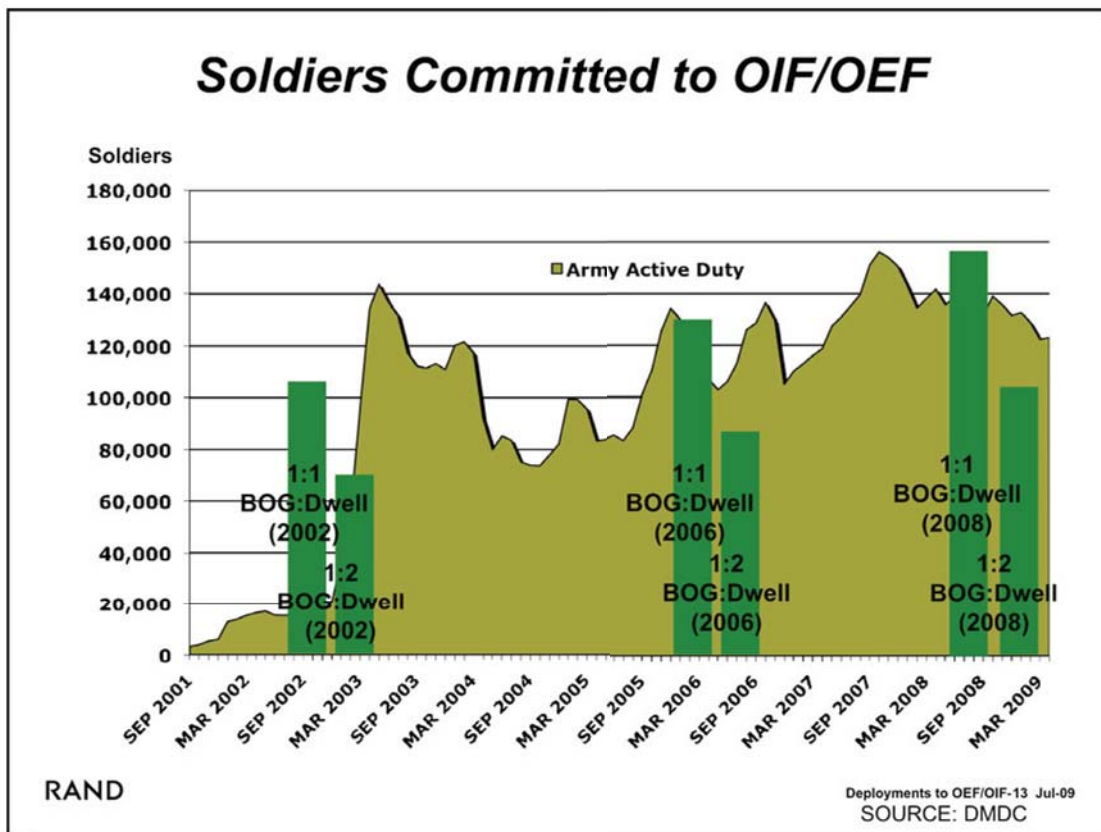
BOG:Dwell Ratio Required to Provide Soldier Numbers Demanded, 2005–2009

Recall that the Army in 2002 could provide 105,000 soldiers at a BOG:Dwell of 1:1 and 70,000 soldiers at 1:2. By increasing end strength and moving soldiers home from Korea and Europe, we estimate that the FY2006 Army could have fielded 130,000 soldiers at a BOG:Dwell of 1:1 and 87,000 soldiers at 1:2. These additional soldiers were needed in the field to meet steadily increasing troop demands in Iraq and Afghanistan after September 2005.

The Army further increased its size, moved soldiers out of the generating force, and reduced its overseas presence so that, by the end of 2008, we estimate that it could have provided 157,000 soldiers at a BOG:Dwell of 1:1 and 105,000 soldiers at 1:2. These would have been enough soldiers to meet peak demands at a 1:1 BOG:Dwell ratio during the 2007 surge. The required

BOG:Dwell declined to between 1:1 and 1:2 from September 2008 through the beginning of 2009.

The DoD goal is to achieve a BOG:Dwell of 1:2 or better for the active components.[7] The Army goal is to eventually reach a 1:3 BOG:Dwell.[8] So far in the current wars, neither goal has been achievable,[9] and neither is likely to be reached soon.[10]

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[7] Robert M. Gates, Secretary of Defense, statement submitted to the Senate Armed Service Committee, January 27, 2009:

> In an effort to meet our nation's commitments and relieve stress on our force and their troops' families, the Department continues to expand the end-strength of the Army and Marine Corps. . . . The expectation is that, with a larger total force, individual troops and units will, over time, deploy less frequently with longer dwell times at home. The goal for the Army is two years off for every year of deployment . . . [and, for the Reserve Component,] the goal is five years of dwell time for one year deployed.

[8] James D. Thurman, Lieutenant General, Deputy Chief of Staff, G-3/5/7, Active Component 12-Month Boots on Ground (BOG) Policy, 10 April 2008.

[9] Tom Philpott, *European Stars and Stripes,* January 31, 2009, Military Update, "Mullen: Money Crisis Will Impact Security":

> The current pace allows a grueling "one-to-one" ratio of "dwell time" at home to time away, usually in a war zone. For Army and Marine ground forces, the ratio is less than one-to-one, Mullen said, which means these fighters, and peacekeepers, are spending more time in Iraq or Afghanistan than they do with families.

[10] William H. McMichael, "Care for Troops, Families Tops Mullen's List of Priorities," *Army Times*, June 8, 2009, p. 8.

4. Mapping Soldier Flows into Units and Identifying Soldiers Not Yet Deployed
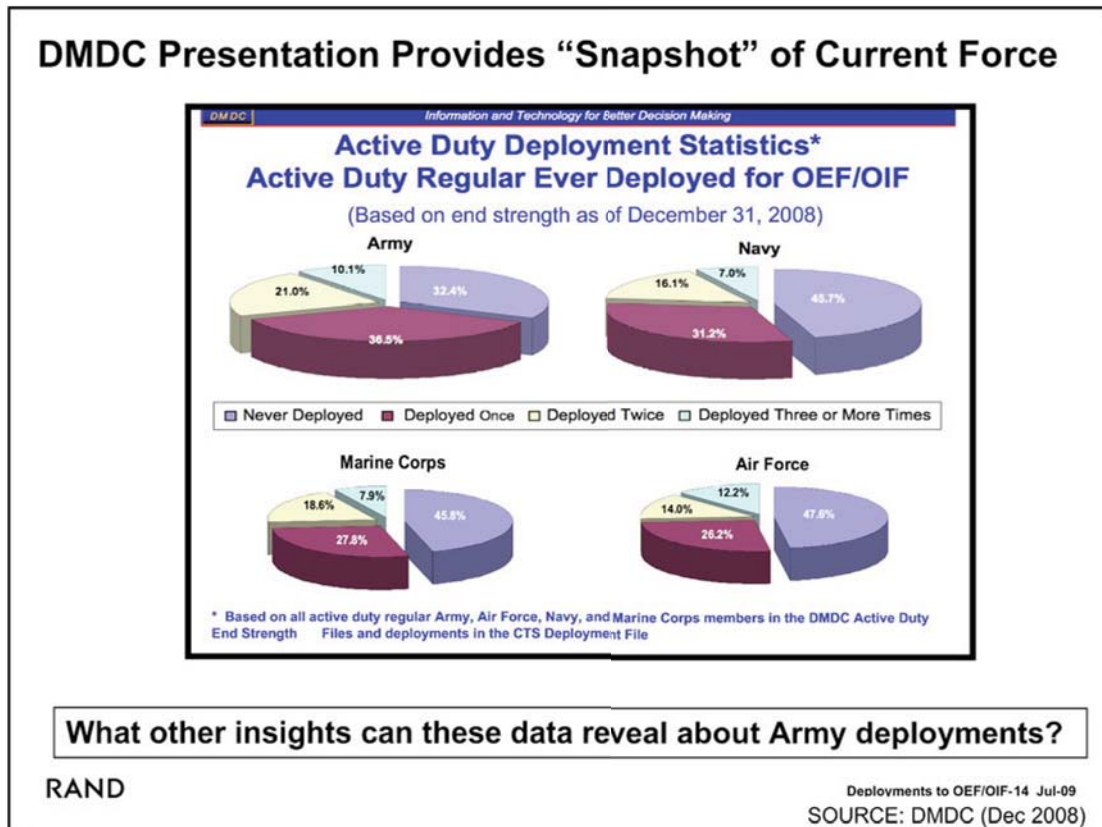
Analyses from USD (P&R)

The DMDC provides some analyses of troop deployments in periodic briefings to the Under Secretary of Defense for Personnel and Readiness (USD[P&R]). One chart from a December 2008 briefing to USD(P&R) is shown above.

Although there is nothing technically wrong with these graphics, they may contribute to two unfortunate misperceptions. First, this graphic only depicts the number of times a particular soldier, sailor, airman, or marine has deployed—and not the cumulative time spent deployed. This has the effect of

obscuring the total level of effort each service has been obliged to maintain in theater. As we have shown in Section 2, it requires the same number of troops to deploy them once and maintain them in theater for a year as it does to deploy them four times and maintain them for three months each time (neglecting additional frictional effects). Furthermore, the adverse psychological effect of the one-year deployment may be larger than the cumulative effects of four 3-month deployments. Therefore, cumulative troop-years deployed is a better measure of the total commitment of human resources to OIF and OEF.[1]

Second, those troops who have not yet deployed to Iraq or Afghanistan are listed as "never deployed." However, a closer examination of the data shows that many of these troops are relatively new to their services and likely have not yet had an opportunity to deploy. We will examine this second issue in this section.

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[1] It may, in fact, be a bit harder to do the shorter turnarounds, because of overlap time, processing, etc.

Soldiers Assigned to One of Three Types of Duties After Training
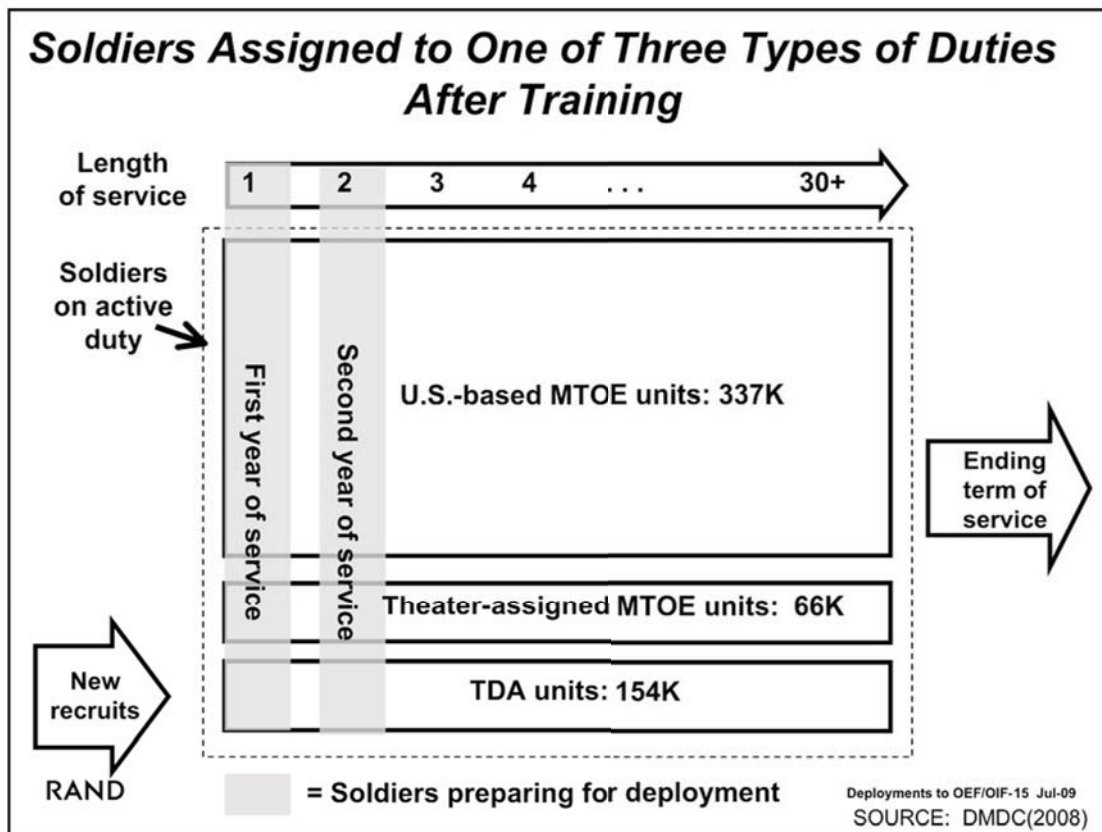
Illustration of the Flow of Soldiers from Recruits to Trained and Ready Soldiers

This chart depicts a simple "production model" for providing active component soldiers to units across the Army.

Beginning at the left, we see new recruits entering the Army. (In FY2008 80,000 new active-duty recruits entered the Army.) Initially, they are assigned to training units and count against the TTHS account. Soldiers in this account are part of the "infrastructure," as are soldiers assigned to "Table of Distribution and Allowances" (TDA) organizations. The TDA also includes soldiers in warrior transition units and soldiers in generating force billets. (We described some of these assignments in Section 3.) All together, the soldiers in the TTHS account and in TDA units comprise the "Institutional Army" or "Infrastructure," in the parlance of the Defense Manpower Requirements Reports (DMRR). The total number of soldiers in the TTHS and in TDA units

and billets was 154,000 as of December 2008. This includes the generating force, the TTHS, and the warrior transition units.

Much of a soldier's first year is spent receiving training and arriving at his or her first post-training assignment. Initial entry training for new recruits can take from four months (for infantry) to roughly a year (for military intelligence). Additional time is consumed in initial processing, in post-training leave, and in moving soldiers to their first post-training assignments. We have labeled these soldiers as "First year of service" in the figure above.

Once their initial training is complete, soldiers are usually assigned to a Modification Table of Organization and Equipment (MTOE) unit. These units comprise the operating forces in the "Operational Army" (or "Forces" in the DMRR lexicon). The U.S.-based MTOE units number 337,000 soldiers, and the MTOE units stationed overseas (e.g., Korea, Europe, etc.) number 66,000. Soldiers might then be deployed to Iraq and Afghanistan as members of any of these units. Most soldiers, however, are deployed to Iraq and Afghanistan as members of U.S.-based MTOE units.

Before deploying, soldiers ideally spend time integrating and training with their assigned units. In theory, the Army could send soldiers directly to theater after they receive their initial entry training and without training as part of their new units. However, these soldiers would then miss both the collective training that makes them part of a cohesive unit and the mission-specific training to give them specialized skills needed in theater. We have labeled these soldiers as "Second year of service" in the figure above.

If newly assigned soldiers joined their units when those units returned from Iraq and Afghanistan, then they would have to wait at least a year before having the opportunity to deploy to Afghanistan and Iraq. This can stretch the length of time that a soldier may be in the Army but not yet deployed to nearly two years, or even more.

We would expect that soldiers in their third year will generally have had the opportunity to deploy—unless they have been assigned to another overseas location or their operational specialty keeps them out of Iraq and Afghanistan.

(These considerations notwithstanding, we will subsequently show that most soldiers in the generating force, stationed at overseas locations, or in the CONUS-based contingency forces with more than three years of service, have deployed at least once to Iraq or Afghanistan.)

In summary, all soldiers in the Army at any given moment—December 2008 in this example—are counted as potentially deployable (i.e., all current soldiers count in the denominator of the deployed fraction). This includes those soldiers new to the service who have not yet had an opportunity to deploy. Those soldiers who have deployed to Iraq or Afghanistan and were still in the Army as of December 2008 are counted as the deployed fraction (they are in both the numerator and denominator). Soldiers who have completed their enlistments or time in service and have left the Army before 2008 do not count toward the end strength or the deployed fraction (that is, they are not counted in the numerator or denominator).

There will always be some fraction of soldiers who have not yet deployed as new soldiers continue to enter the Army and are trained and integrated with units with pending deployment orders. Eventually most of these new soldiers will deploy—but as they do, soldiers with deployment histories will leave and new soldiers will enter.

Growth in Numbers of Deployed Soldiers Depends Upon Flow Into, Through, and Out of Army

Length of service: 1   2   3   4   . . .   30+

Soldiers on active duty →

First year of service — 80K

Second year of service — 66K

U.S.-based MTOE units 255K

Theater MTOE: 51K

TDA: 105K

New recruits →

Ending term of service →

SOURCE: DMDC(2008)
Deployments to OEF/OIF-16 Jul-09

RAND
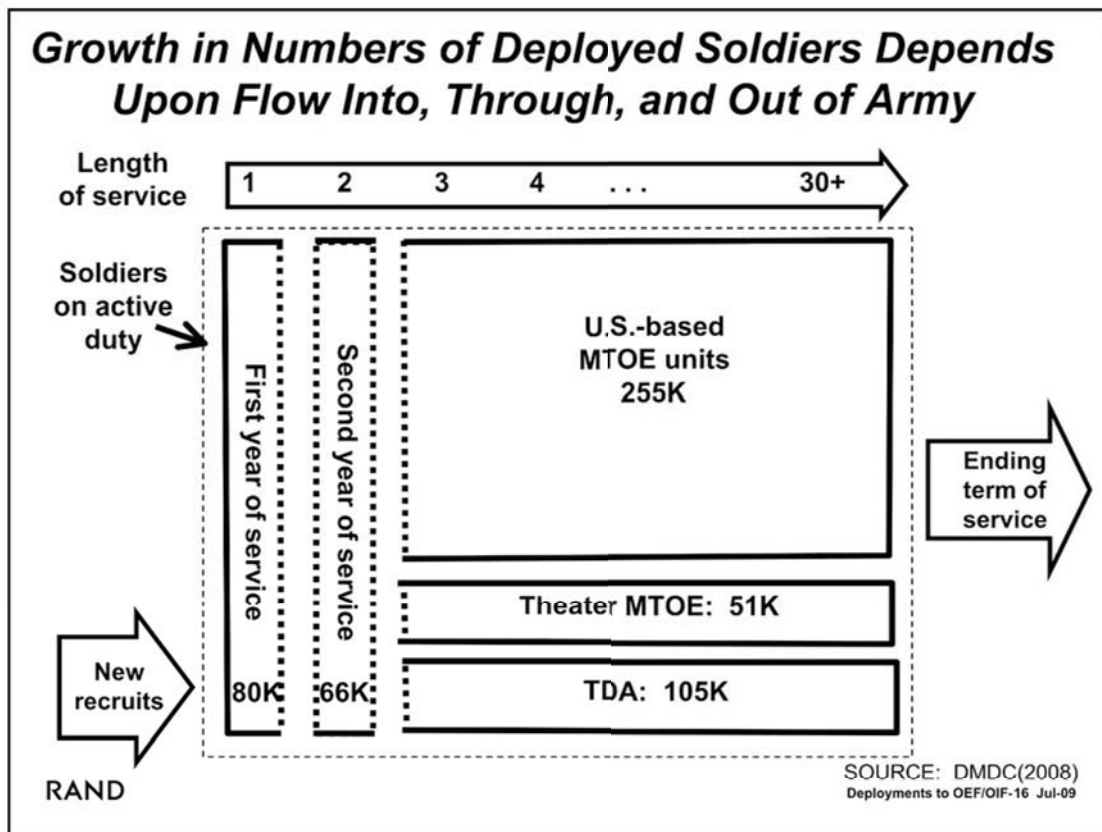
Size of Each Pool

We regrouped the soldiers in the Army into each of the bins above to account for the fact that soldiers in their first year are engaged in individual training or beginning integration with the units to which they have been assigned. Many soldiers in their second year are training and exercising with their first units. Therefore, substantial numbers of soldiers in their first and second years are still preparing to deploy; some—particularly from the second year—may already be deployed.

(Please note that some soldiers in each one of these categories have deployed or may currently be deployed. As we will show below, most of the soldiers who have deployed are in the U.S.- and overseas-based MTOE units. However, some fraction of the soldiers in virtually all of these categories is currently deployed.)

We will look at the soldiers in each of these groups separately from soldiers with three or more years of service in the U.S.-based MTOE, Theater MTOE, or TDA units.

In December 2008 the Army had:

- 80,000 soldiers in their first year (i.e., with 0–12 months) of service. These soldiers were in initial entry training or integrating with their first assigned units.

- 66,000 soldiers in their second year (i.e., 13–24 months) of service. These soldiers were in unit-level training or otherwise serving with their first assigned units.

- 255,000 soldiers with more than two years of service in U.S.-based MTOE contingency forces.

- 51,000 soldiers with more than two years of service in overseas-based MTOE contingency forces.

- 105,000 soldiers with more than two years of service in TDA units worldwide.

Most Soldiers Eventually Deploy to OEF or OIF

Soldiers

Legend:
— Not-yet-deployed to OIF/OEF
— Total soldiers by year group

Year Group

RAND

Deployments to OEF/OIF-18 Jul-09
SOURCE: DMDC
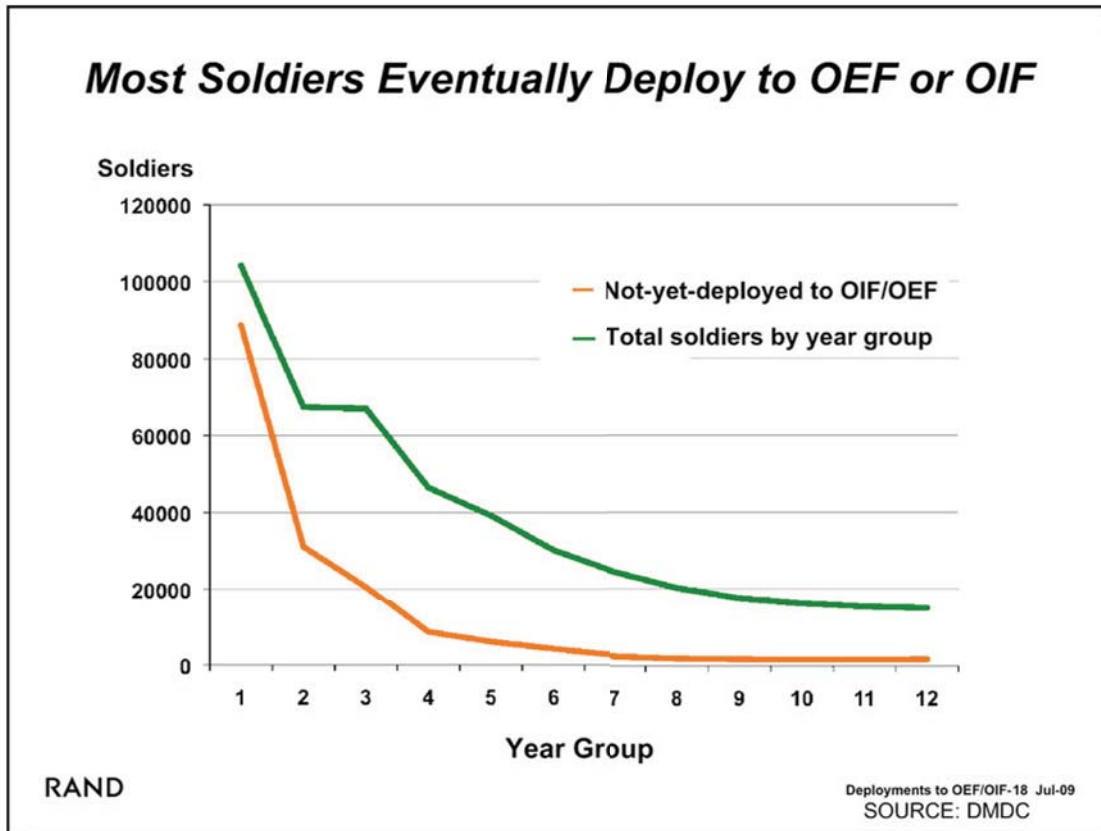
A question arising at this point in our work was: Will the soldiers who have not deployed in their first or second year eventually deploy? How do we know that many of these soldiers will not fill jobs that do not require them to deploy to OEF or OIF? The answer, in large part, can be seen in the figure above. The green line shows the total number of active-duty soldiers in the Army by year group. (That is, soldiers within year 1 have served in the Army for 0–12 months, etc.) The orange line shows the number of troops who have not yet deployed. One can see that the fraction of "not-yet-deployed" soldiers is very high for the 1-, 2-, and 3-year groups. However, each succeeding year group has a higher fraction of soldiers who have deployed—reaching 82 percent deployed by year 4. Ultimately, 90 percent of more experienced year-groups have deployed to OEF or OIF.

Most Soldiers with 2+ Years of Service Have Deployed to OIF or OEF
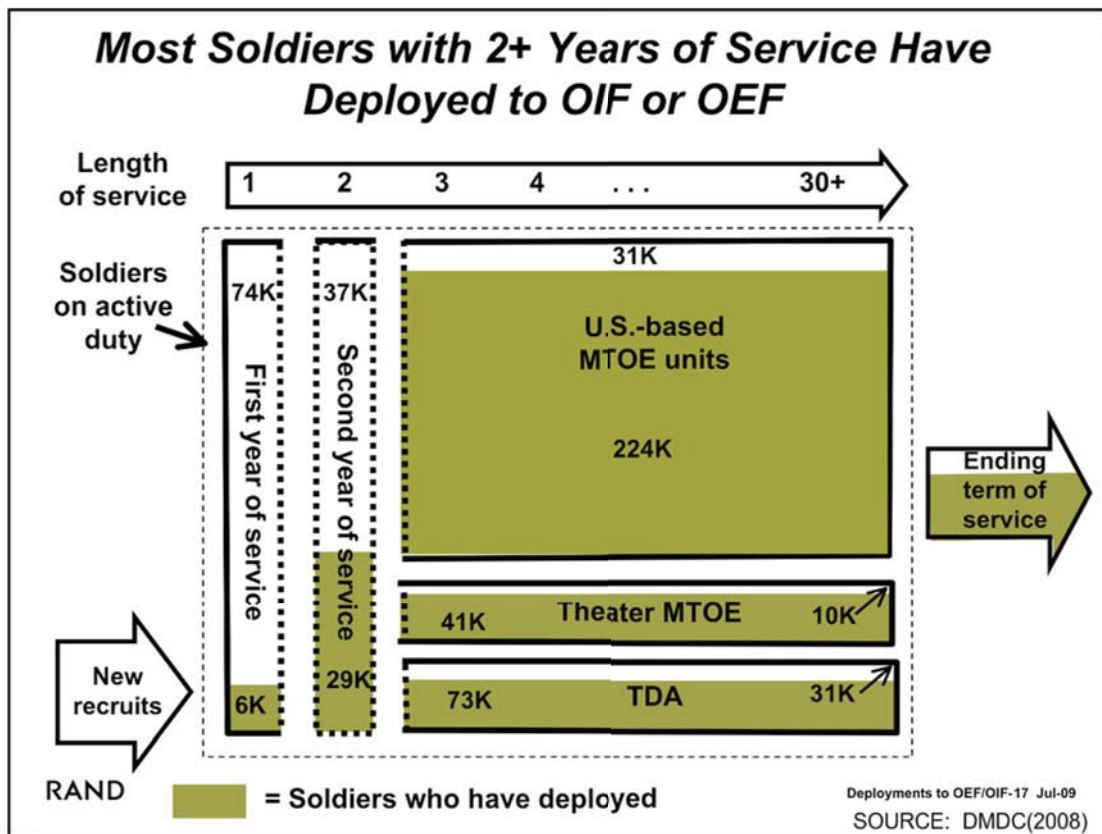
Identify Groups of Trained and Ready Soldiers Who Have Not Yet Deployed

Of the 80,000 soldiers in the Army in their first year of service as of December 2008, 6,000 of them have deployed. The remaining 74,000 are still in their initial entry training, on their way to their first unit assignments, or integrating and training with their first units.

Of the 66,000 soldiers in their second year of service, 29,000 of them have deployed or are currently deployed. Of the remaining 37,000 soldiers, most are assigned to CONUS-based MTOE units preparing to deploy. The rest are in MTOE units assigned to overseas theaters, or in TDA units.

The majority of soldiers with more than two years of experience have deployed. Of the 255,000 soldiers assigned to CONUS-based MTOE units, 224,000 of them (88 percent) have deployed to Iraq or Afghanistan or are currently deployed. Of the 51,000 soldiers with more than two years of

experience assigned to MTOE units stationed overseas, 41,000 of them (80 percent) have previously deployed to Iraq or Afghanistan. Similarly, among the 104,000 soldiers with more than two years of experience assigned to TDA units, 73,000 of them (70 percent) have previously deployed to Iraq or Afghanistan.

In addition, 65 percent of the veterans who left the Army in 2008 had deployed to Iraq or Afghanistan.
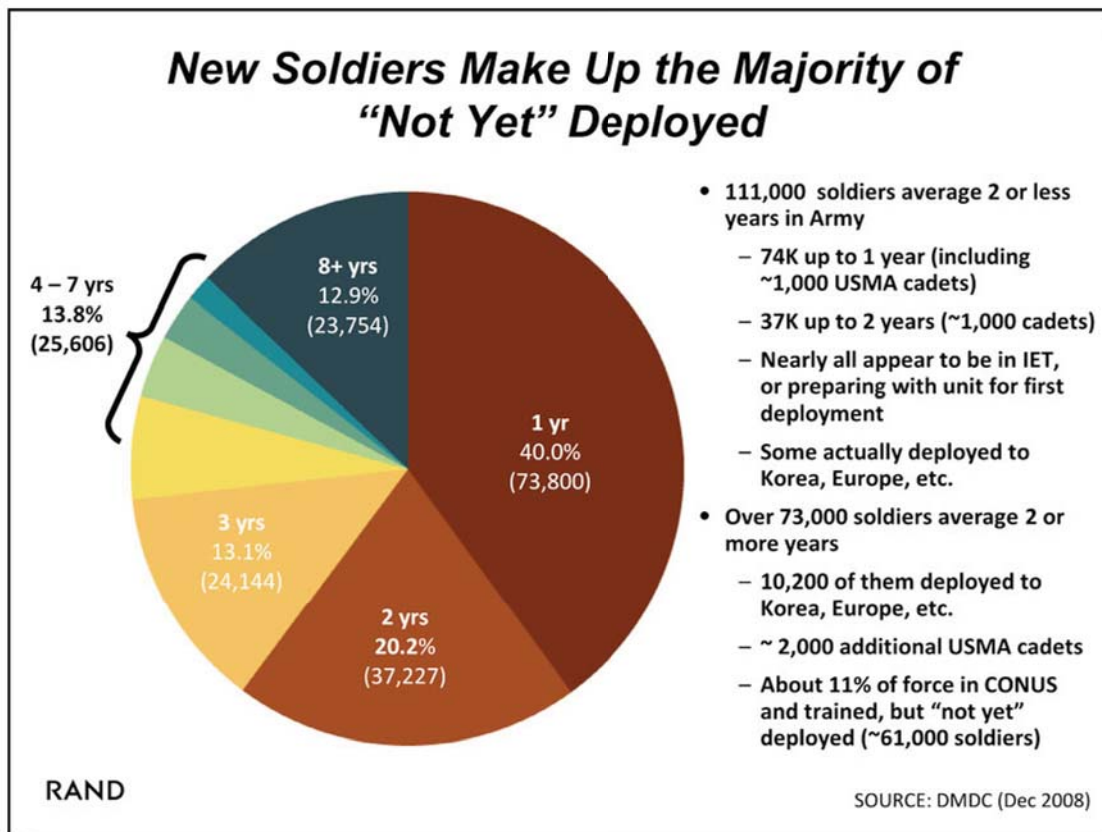
Distribution of Not-Yet-Deployed Soldiers by Length of Service

Now let's look at the not-yet-deployed soldiers by length of service. The first thing to note in this chart is that the majority (60 percent) of the not-yet-deployed soldiers have been in the service for 1–2 years. This suggests that most of these soldiers are still in initial training or are in their first unit assignment and awaiting deployment. Also in this category are about 1,000 first-year and 1,000 second-year cadets at the U.S. Military Academy at West Point, New York. Roughly 2,000 third-year and fourth-year cadets are included in the 3-year and 4-year bins.

On the other end of this experience range, the 8+-year slice contains more senior personnel. There are fewer requirements for these more senior personnel in theater, so it takes longer to cycle a large number of personnel through these assignments.

There are other reasons why soldiers in the Army for more than two years have not yet deployed. For example, there are 10,000 personnel with more than two years of experience who are currently in Korea, Europe, and at other overseas locations. These soldiers are serving with forward-deployed units, but they are not included in the "deployed" category because they have not yet deployed in support of OEF or OIF.

Much of Remainder Composed of Soldiers in Key Specialties or Stationed Overseas

- 61,000 soldiers in CONUS with more than 2 years

Pie chart:
- 8+ yrs 12.6% (24,000)
- 4–7 yrs 11.6% (25,000)
- 3 yrs 11.2% (24,000)
- 2 yrs 20% (37,000)
- 1 yr 40% (74,000)

Exemplar MOSs

Military Occupational Specialty	CONUS Not Yet Deployed	Deployed Peers
Medical/ Health	13,421	24,970
Intelligence/ Networks	9,034	42,746
Air Defense	2,752	4,880
Recruiting	2,365	1,673

27,572 soldiers

RAND

Deployments to OEF/OIF-24 Jul-09
SOURCE: DMDC (Dec 2008)

Distribution of Not-Yet-Deployed Soldiers by Military Occupational Specialty

To recap, over 73,000 soldiers have more than two years of service in the Army and have not yet deployed to Iraq or Afghanistan. Approximately 10,000 of these soldiers are serving in Korea, Europe, or some other overseas location. After accounting for U.S. Military Academy cadets, 61,000 soldiers having more than two years of service are in the United States who have not yet deployed to OEF or OIF.

Of these 61,000, a total of 27,572 personnel are assigned to missions that directly contribute to OEF/OIF or other defense missions but are not located in theater. Over 13,000 of them are medical personnel at facilities like Walter Reed; another 9,000 are intelligence, strategic signals, and network personnel at Fort Mead and similar installations; roughly 2,800 are air defense personnel who occasionally deploy to the vicinity of North Korea, and about 2,400 are

permanent recruiters spread across the United States. These soldiers contribute directly to the military effort in Iraq, Afghanistan, and elsewhere, but their occupations keep them outside the current war theaters.

These personnel, too, may someday deploy. Of the personnel in the medical field, almost 25,000 of those with more than two years of experience have deployed—as have most of those in the larger intelligence, signals, and network community, and in the air defense community. It will take some time for the remaining personnel in each of these communities to cycle through the deployed positions in each of these occupational specialties.

May Take Time to Rotate Some Soldier Specialties into Deploying Units

TDA units 18,000
TRADOC 13,000
MTOE units 30,000

Korea, overseas 10,000

61,000 soldiers

New to Army 113,000

Have deployed 373,000

Exemplar MOSs

Military Occupational Specialty	CONUS Not Yet Deployed
Medical/ Health	13,421
Intelligence/ Networks	9,034
Air Defense	2,752
Recruiting	2,365
	27,572 Soldiers

RAND

SOURCE: DMDC (Dec 2008)
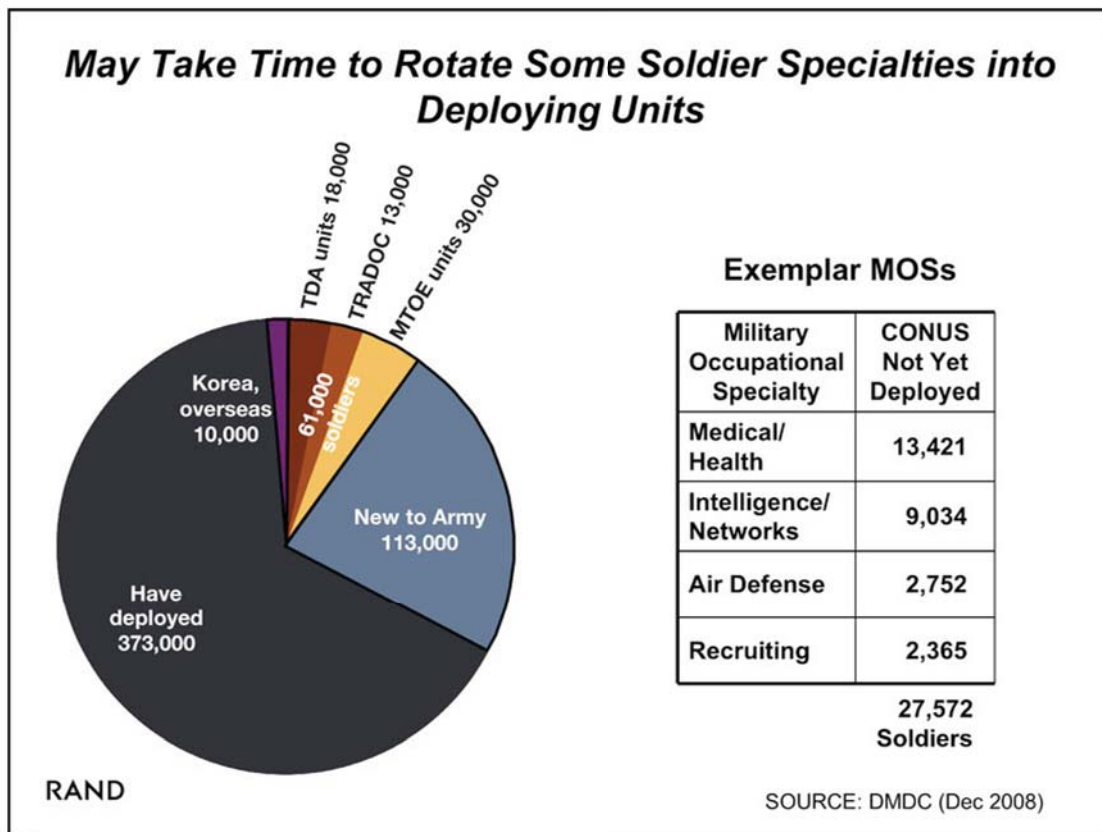
Distribution of Not-Yet-Deployed Soldiers by Unit of Assignment and Military Occupational Specialty

To review, our analyses provide the following picture of the incidence of Army deployments as of December 2008:

373,000 soldiers have deployed to Iraq or Afghanistan: usually for more than one tour.

Of the 184,000 who have not yet deployed, 113,000 soldiers (including 4,000 West Point cadets) are still preparing to deploy. They are typically completing initial entry training, training with the first units to which they have been assigned, or awaiting their first deployments to Iraq or Afghanistan.

An additional 10,000 soldiers who have been in the Army more than two years are forward-deployed to Korea, Europe, or other overseas locations. That leaves 61,000 soldiers who have been in the Army for more than two years, are in CONUS, and have not yet deployed to Iraq or Afghanistan.

These 61,000 personnel are assigned to CONUS-based MTOE units (30,000), TRADOC (13,000), or other non-TRADOC TDA units (18,000). Looked at another way, 27,572 of these remaining 61,000 soldiers are assigned to missions that are critical to OEF/OIF but are not located in the deployed theater.

That leaves around 34,000 soldiers who have not yet deployed. Of these, 3,000 have been injured prior to deployment and are in warrior transition units.

The final 31,000 soldiers (about 6 percent of the active-duty force) are in the United States, have more than two years in the Army, but have not yet deployed to OIF or OEF.

Conclusions

- Army has provided over 1 million troop-years to OIF and OEF
  - Soldiers 52% of all cumulative DoD active-duty deployments
  - Average of 128,000 active-duty soldiers maintained in OIF/OEF since September 2005
- Active-duty soldiers have deployed at a BOG:Dwell ratio between 1:1 and 1:2 since the beginning of OIF
  - For much of this period, soldiers have deployed at a 1:1 ratio
  - Increases in contingency pool absorbed by increased demand
- Our assessment of the 2008 Army concludes that:
  - 67% have deployed to OIF/OEF – have large cumulative deployed time
  - 20% are new to Army – still training, integrating, or preparing to deploy
  - 2% have not yet deployed to OIF/OEF but are deployed to other overseas locations
  - 5% have not yet deployed to OIF/OEF and are in jobs key to current global military operations
  - Additional soldiers hurt prior to deploying
    - Total: 94% [or more] are conducting, preparing for, or supporting missions in OIF or OEF or at other overseas locations

RAND   Deployments to OEF/OIF-23 Jul-09

Answers to the Research Questions Posed

1. Army Troop Levels Maintained in OIF and OEF

We found that the Army has provided over 1 million troop-years to OIF and OEF through December 2008.[2] Active-duty soldiers alone have contributed over 700,000 troop-years to these two wars. From the beginning of OIF in March 2003 through December 2008, the Army has maintained an average of 117,000 active-duty soldiers in OIF and OEF combined. The combined average increased to 128,000 active-duty soldiers from September 2005 through December 2008.

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[2] Total of all Army active-duty and mobilized reserve component soldiers who have served time in OIF or OEF since the beginning of these conflicts. This includes soldiers who have subsequently left the service.

In the process of accumulating this much deployed time, most of the active-duty soldiers in the Army (67 percent) have deployed to OIF or OEF—and most of those soldiers have deployed for a second or third year. Approximately 373,000 of the soldiers in the Army as of December 2008 had served in OIF or OEF.[3] Over 121,000 have deployed for their first year, 173,000 for their second year, and 79,000 for their third year or longer. Of this last group, over 9,000 are deploying for their fourth year. The burden falls most heavily on the middle ranks of the officers and the noncommissioned officers. These soldiers have more deployed time than their counterparts from the other services.

2. Soldier BOG:Dwell Ratios

To maintain a high number of soldiers in theater, the Army has deployed them at BOG:Dwell ratios between 1:1 and 1:2—and closer to 1:1—since the beginning of OIF. Boots on ground, or BOG, refers to the time that soldiers spend in theater at their deployed locations. "Dwell" is supposed to represent the time that soldiers spend at their home stations. (In practice, however, the time spent traveling to theater, the time spent traveling home, and the time training away from home station is counted as dwell.)

The BOG:Dwell ratios the Army has sustained in OIF and OEF show that soldiers have deployed more often than the DoD goal of 1:2 for the active component. The Army has increased end strength, moved soldiers from Korea and Europe to home-stationed units, and has decreased the size of the generating force in order to generate more deployable soldiers. However, until recently, demand has increased as quickly as the number of available soldiers—so no net easing of deployment ratio has resulted.

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[3] These 373,000 are all of the soldiers, still on active duty as of December 2008, who deployed one or more times to OIF or OEF.

3. Soldiers Not Yet Deployed

We examined the statement that roughly one-third of the Army has "never deployed" to OIF and OEF. [4] We found that most of the soldiers included in this category are relatively new to the service, and are often still in training. Therefore, a better characterization for these soldiers (and likely the new members of other services) is "not-yet-deployed" to Iraq or Afghanistan. Out of an active-duty strength of 557,000 soldiers as of December 2008, the Army had deployed 373,000 soldiers. The remaining 184,000 soldiers had not yet deployed. New soldiers account for a majority (109,000) of the Army's "not-yet-deployed" numbers, and roughly 4,000 more personnel are cadets at the U.S. Military Academy, who count toward active-duty end strength.

Of the remaining 71,000, there are over 10,000 soldiers forward-stationed in Korea, Europe, or other overseas locations who have not yet served in OIF or OEF. Another 27,000 are in military occupational specialties that support the current war efforts or other contingency missions, but are not located within Iraq or Afghanistan.

That leaves 34,000 soldiers—of which 3,000 have been injured prior to deployment and are in warrior transition units. The final 31,000 soldiers (about 5.6 percent of the active-duty force) are in the United States, have more than two years in the Army, but have not yet deployed to OIF or OEF.

To recapitulate, the breakout of soldiers in the Army as of December 2008 is as follows:

- 67 percent of the active-duty Army has deployed and contributed a large, and growing, cumulative time deployed in theater.

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[4] See for example briefing by Kris L. Hoffman, Defense Manpower Data Center entitled "Deployment Accountability Update (June 2008 CTS Deployment File)", repared for the Honorable Dr. David S. C. Chu, Under Secretary of Defense for Personnel & Readiness, July 31, 2008

- 20 percent are recently accessed (including U.S. Military Academy cadets); most of these will deploy when ready, depending on requirements in the OIF and OEF theaters.
- 2 percent have not yet deployed to OIF or OEF and are currently deployed to other overseas locations; they may be rotated through OIF or OEF as they are borrowed from their current stations or after they complete these assignments.
- 5 percent have not yet deployed to OIF or OEF and are in key jobs supporting global military operations; these soldiers too may deploy if they are sent as individual replacements, or, as above, they may deploy in a subsequent assignment.
- 3,000 additional soldiers were hurt prior to deploying.

Therefore, in total, our assessment is that virtually all of the Army's currently serving soldiers have either already deployed to OIF/OEF at least once (67 percent) or simply have not served long enough to get deployed (20 percent). Of the remainder, 7 percent is made up of soldiers who have not had an opportunity to deploy to OIF/OEF because they have been needed elsewhere, or have been injured prior to deploying. This leaves a small portion of the force—less than 6 percent—made up of soldiers who have been in the Army more than two years, are in military occupational specialties that do typically deploy to Iraq and Afghanistan, are serving in units stationed in the United States, but have not yet deployed to OIF or OEF.

Conclusions

The Army has provided the bulk of U.S. troops to OIF and OEF: over 1 million troop years as of December 2008. These deployments represent 52 percent of the total troop deployments within the area of operations, and over 75 percent of the deployments on the ground in Iraq, Kuwait, and Afghanistan in 2008.

Since the beginning of OIF, the active-duty soldiers who have deployed have operated at a BOG:Dwell ratio of approximately 1:1. Almost 67 percent of

the soldiers in the Army in December 2008 had deployed to Iraq and Afghanistan. Most of these soldiers were working on their second or third year of cumulative deployed duty.

Most of the remaining soldiers (about 20 percent) were new to the Army and still engaged in individual, collective, or unit training. Of the remainder, 7 percent are in key specialties supporting current operations or are deployed to Korea or Europe. Therefore, the active-duty Army is almost completely (about 94 percent) utilized and therefore retains very little unutilized capacity to deploy additional active-duty soldiers.

Appendix: Defense Manpower Data Center's Personnel Deployment Accountability Update[1]
(May 2007 CTS Deployment File)

Contingency Tracking System (CTS) Program Overview

CTS program information is used to determine individual and family member benefits, provide information for health surveillance programs during and after deployments, and provide information to DoD decision makers. The CTS program has two components: the Deployment Files and the Activation Files. The CTS Deployment File is used for tracking the location of deployed personnel; deployment information is collected by DMDC according to the requirements of Department of Defense (DoD) Instruction 6490.3, "Deployment Health," and MCM-0006-02, "Updated Procedures for Deployment Health Surveillance and Readiness." CTS deployment information is provided to the Department of Veterans Affairs (VA) to ensure that appropriate post-war health care and compensation are available for veterans.

Contingency Tracking System (CTS) Deployment File Overview

The CTS Deployment File entered production in August 2004 and is the successor to other systems used to track personnel involved in contingency operations since Desert Shield/Storm (Gulf War I). It includes all U.S. military personnel who have been deployed in support of the Global War on Terror, i.e., Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). It covers the entire OEF/OIF timeline from September 11, 2001 to the present.

It is updated monthly and includes a separate individual record for every deployment event, for each member, and a specific beginning date and ending

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[1] Michelle Rudolph, Defense Manpower Data Center, prepared for the 10th Annual Force Health Protection Conference, 4–10 August 2007.

date for each event. It also includes the member's specific location on specified dates *if* this information is provided by the service, as well as demographics for the member as of the specific beginning and ending date of the event.

Contingency Tracking System (CTS) Deployment Definition

A CTS "deployment" for OEF/OIF is defined as a DoD service member who is or has been *physically located* within the OEF/OIF combat zones or areas of operation (AOR), or has been *specifically identified* by his/her service as "directly supporting" the OEF/OIF mission outside the designated combat zone (e.g., USAF aircrew or support personnel located at an airbase outside the combat zone).

CTS Deployment File: Data Sources Service and Agency Deployment Submissions

- Army:
  - Deployed Theater Accountability System (DTAS), August 2004 to present
  - Joint Theater Personnel Repository (JTPR), January 2003 to August 2004
- Navy:
  - Individual Tempo (ITEMPO), September 2001 to present
  - Navy Status of Forces (NSOF) file
- Marine Corps:
  - Marine Corps Total Force System (MCTFS), September 2001 to present
  - DTAS, August 2004 to present
- Air Force:
  - Deliberate Crisis Action Planning and Execution Segment (DCAPES), September 2001 to present
- Defense Finance and Accounting Service (DFAS):

— Combat Zone Tax Exclusion (CZTE) or Imminent Danger Pay (IDP) Extract File, September 2001 to present

CTS Deployment File: Data Users

- Office of the Secretary of Defense
- Office of the Under Secretary of Defense for Personnel and Readiness
- Office of the Deputy Under Secretary of Defense for Program Integration
  - Defense Enrollment Eligibility Reporting System

- Office of the Assistant Secretary of Defense for Health Affairs
  - Deployment Health Support Directorate
  - DoD Center for Deployment Health Research
  - U.S. Army Center for Health Promotion and Preventive Medicine
  - Army Medical Surveillance Activity
  - Naval Health Research Center
  - Air Force Institute of Health

- Office of the Assistant Secretary of Defense for Reserve Affairs
- Office of the Deputy Under Secretary of Defense for Manpower Personnel Policy
- Office of the Chairman Joint Chiefs of Staff
  - J1
  - J8

- Office of the Assistant Secretary of Defense for Public Affairs
- United States Central Command
- Department of Veterans Affairs
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