



NATIONAL DEFENSE RESEARCH INSTITUTE

THE ARTS
CHILD POLICY
CIVIL JUSTICE
EDUCATION
ENERGY AND ENVIRONMENT
HEALTH AND HEALTH CARE
INTERNATIONAL AFFAIRS
NATIONAL SECURITY
POPULATION AND AGING
PUBLIC SAFETY
SCIENCE AND TECHNOLOGY
SUBSTANCE ABUSE
TERRORISM AND
HOMELAND SECURITY
TRANSPORTATION AND
INFRASTRUCTURE
WORKFORCE AND WORKPLACE

This PDF document was made available from www.rand.org as a public service of the RAND Corporation.

[Jump down to document](#) ▼

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world.

Support RAND

[Purchase this document](#)

[Browse Books & Publications](#)

[Make a charitable contribution](#)

For More Information

Visit RAND at www.rand.org

Explore [RAND National Defense Research Institute](#)

View [document details](#)

Limited Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law as indicated in a notice appearing later in this work. This electronic representation of RAND intellectual property is provided for non-commercial use only. Unauthorized posting of RAND PDFs to a non-RAND Web site is prohibited. RAND PDFs are protected under copyright law. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents for commercial use. For information on reprint and linking permissions, please see [RAND Permissions](#).

This product is part of the RAND Corporation monograph series. RAND monographs present major research findings that address the challenges facing the public and private sectors. All RAND monographs undergo rigorous peer review to ensure high standards for research quality and objectivity.

Networked Forces in Stability Operations

101st Airborne Division,
3/2 and 1/25 Stryker Brigades
in Northern Iraq

Daniel Gonzales, John Hollywood, Jerry M. Sollinger, James McFadden,
John DeJarnette, Sarah Harting, Donald Temple

Prepared for the Office of the Secretary of Defense
Approved for public release; distribution unlimited



NATIONAL DEFENSE RESEARCH INSTITUTE

The research described in this report was prepared for the Office of the Secretary of Defense (OSD). The research was conducted in the RAND National Defense Research Institute, a federally funded research and development center sponsored by the OSD, the Joint Staff, the Unified Combatant Commands, the Department of the Navy, the Marine Corps, the defense agencies, and the defense Intelligence Community under Contract DASW01-01-C-0004.

Library of Congress Cataloging-in-Publication Data

Networked forces in stability operations : 101st Airborne Division, 3/2 and 1/25 Stryker brigades in northern Iraq / Daniel Gonzales ... [et al.].

p. cm.

Includes bibliographical references.

ISBN 978-0-8330-4303-0 (pbk. : alk. paper)

1. Command and control systems—United States—Evaluation—Case studies.
2. Communications, Military—Evaluation—Case studies.
3. Stryker brigade combat teams—Evaluation—Case studies.
4. United States. Army. Airborne Division, 101st—History—21st century.
5. United States—Armed Forces—Stability operations—Evaluation.
6. Iraq War, 2003—Campaigns. I. Gonzales, Daniel, 1956–

UA943.N48 2007

956.7044'342—dc22

2007041879

Public release of this report was granted by the Chief of the DoD Office of Security Review on 17 September 2007, per DD Form 1910.

The RAND Corporation is a nonprofit research organization providing objective analysis and effective solutions that address the challenges facing the public and private sectors around the world. RAND's publications do not necessarily reflect the opinions of its research clients and sponsors.

RAND® is a registered trademark.

© Copyright 2007 RAND Corporation

All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from RAND.

Published 2007 by the RAND Corporation

1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138

1200 South Hayes Street, Arlington, VA 22202-5050

4570 Fifth Avenue, Suite 600, Pittsburgh, PA 15213-2665

RAND URL: <http://www.rand.org>

To order RAND documents or to obtain additional information, contact

Distribution Services: Telephone: (310) 451-7002;

Fax: (310) 451-6915; Email: order@rand.org

Summary

Background

The Stryker brigade, one of the Army's newest units, has advanced command, control, and intelligence capabilities and uses a network-centric concept of operations. These capabilities include the full complement of Army digital communications and battle command systems. Its networked capabilities enabled it to employ network-centric operations (NCO) capabilities down to a lower echelon than other Army units. An important issue for the Department of Defense and the Army is whether these improved capabilities translate into an information advantage and, if so, whether that advantage results in greater mission effectiveness in stability operations.

Purpose and Approach

This study attempts to answer those two questions by focusing on the Stryker brigade's performance in stability operations. It employs the case-study methodology to examine three units that operated in the same area in Iraq between 2003 and 2005: the 101st Airborne Division (ABD), the 3/2 Stryker brigade combat team (SBCT), and the 1/25 SBCT. All served in Iraq's northern provinces. The study compares the performance of the units along a number of dimensions. The comparisons between the 101st ABD and the Stryker brigades are especially important because, although the 101st ABD had some advanced battle command systems, it was largely an "analog" unit, i.e., one that communicated using analog radios and generally used voice-only, line-of-sight communications at the tactical level. In many respects, the units of the 101st ABD closely resemble light infantry brigades. In contrast to the 101st ABD, Stryker units had networked digital communications networks and access to high-capacity satellite

communications at lower echelons, which enabled them to communicate even when units did not have line of sight between them.

We recognize the issues inherent in the methodology and in the specific comparisons we make. Case studies are essentially qualitative comparisons, although they can be informed by quantitative information. Additionally, they are analogies because in real-world operations the cases are not identical. We also recognize that the situations confronting the three units differed substantially, even though all three units operated in the same provinces in Iraq. The 101st ABD was there shortly after major combat operations (MCO) concluded but before the insurgency had hit full stride. Furthermore, the two Stryker brigades did not have identical sets of equipment. The 1/25 SBCT had more enhanced communications and intelligence capabilities than did the 3/2 SBCT. That said, we believe that the methodology can shed light on the performance of the two types of units and on how network-centric capabilities affect unit performance.

We use two of the four U.S. objectives for stability and reconstruction in Iraq (see Table S.1) to assess the mission effectiveness of stability operations undertaken by each unit.

Table S.1
U.S. Stability Objectives

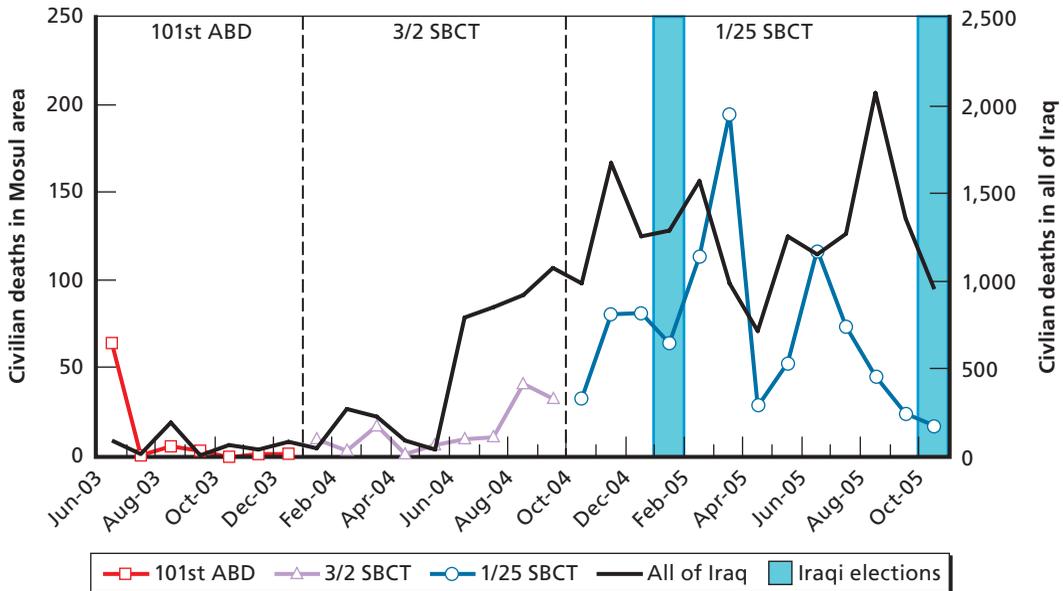
Political	Forge a broadly supported national concept for democratic governance
Security	Defeating terrorists and containing insurgents

Civilian Deaths

Figure S.1 plots reported civilians killed in action (KIAs) by month for all of Iraq and for Mosul. As shown, the number of civilian KIAs per month surged in June 2004 and remained roughly flat or increased slightly thereafter throughout Iraq as a whole. The data indicate that there has not been any sustained reduction in civilian casualties in Iraq overall after the peaks in February and August 2005.

Before we turn to a detailed examination of each unit’s performance, we look at trends in civilian and U.S. casualties in Iraq and in northern Iraq.

Figure S.1
Civilians Killed in All of Iraq and in Mosul



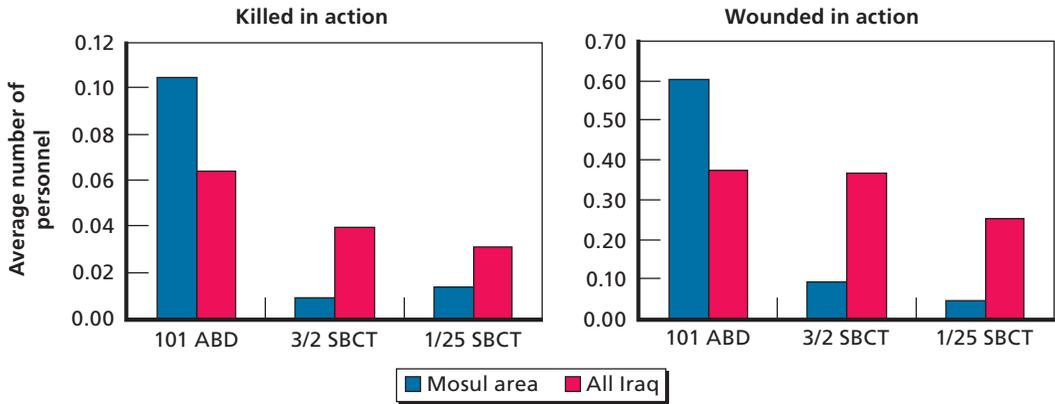
RAND MG593-S.1

Figure S.1 also plots reported civilian KIAs for Mosul and indicates when each unit operated in Mosul and elsewhere in northern Iraq. In comparison with civilian KIAs elsewhere in Iraq, civilian KIAs in Mosul fall off sharply after June 2005. This pattern is consistent with reports that the 1/25 SBCT defeated a major insurgent offensive in Mosul, captured key insurgent leaders, and disrupted insurgent operations.

U.S. Casualties Adjusted for Operational Tempo

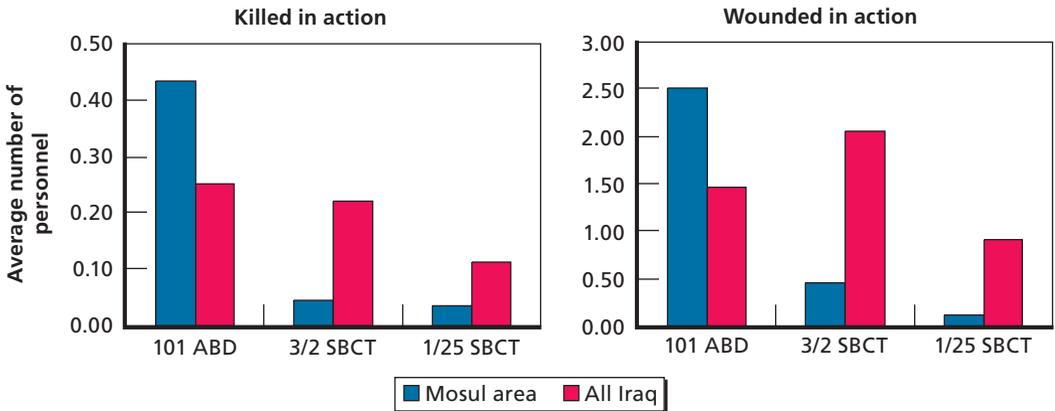
Figures S.2 and S.3 show order-of-magnitude reductions in casualty rates for both Stryker brigades relative to both the 101st ABD and other units in Iraq at the same time, when operational intensity (both enemy and U.S.) factors are taken into account. These results reflect the growing intensity of Stryker brigade operations in response to attacks as the insurgency grew over time. Note that the 1/25 SBCT casualty rates

Figure S.2
U.S. Personnel Killed and Wounded in Action per Enemy Attack



RAND MG593-S.2

Figure S.3
U.S. Personnel Killed and Wounded in Action per Offensive Operation



RAND MG593-S.3

(adjusted for operational tempo [OPTEMPO] and enemy attacks) are the lowest of all units in Area of Operation (AO) North.

Our analysis of SBCT tactical defensive operations indicates the SBCT's combined materiel improvements (Force XXI Battle Command Brigade and Below (FBCB2) and digital communications) and nonmateriel improvements (doctrine; tactics, techniques, and procedures [TTPs]; training) led to significant improvements in blue force quality of information and situation awareness. In some cases, the SBCTs were able to capitalize on improved blue force awareness to execute a number of advanced tactics, including accelerated planning, dynamic force retasking, self-synchronization, and swarming, which in turn led to improvements in performing tactical defensive missions. The SBCTs displayed a robust dynamic response to enemy ambushes and attacks.

The 1/25 SBCT also used these advanced tactics, new networked intelligence capabilities, and decentralized operations to conduct targeted raids that enabled Stryker units to respond quickly and effectively to intelligence tips. Further, these new intelligence capabilities were integrated into the tactical capabilities of 1/25 SBCT units.¹ These operations would not have been possible without the SBCTs' information and networking capabilities embedded at the tactical level.²

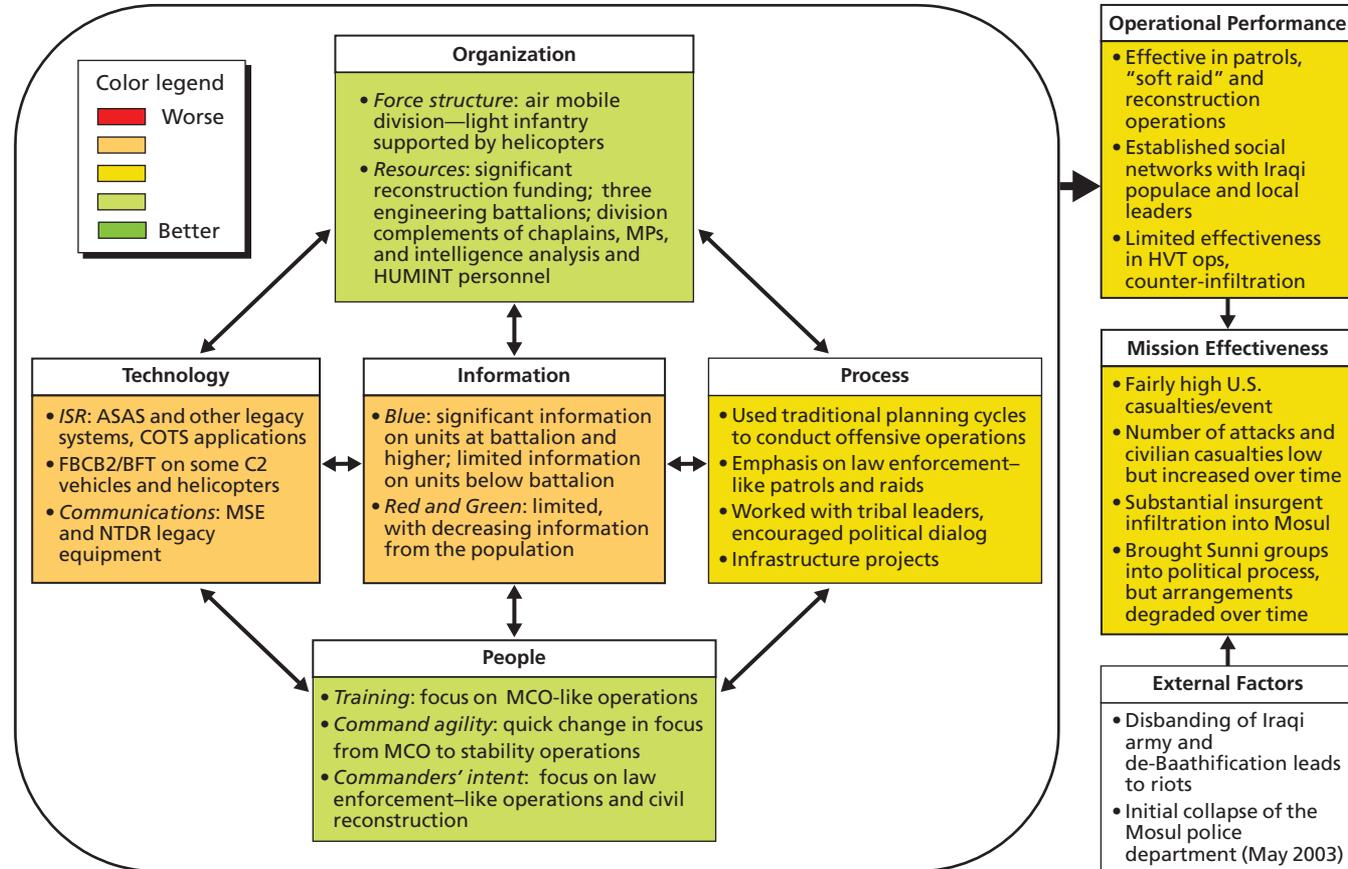
Assessment of 101st ABD Mission Effectiveness

Figure S.4 summarizes the materiel and nonmateriel factors contributing to the performance of the 101st ABD in Iraq. From a communications network technology perspective, the 101st ABD benefited from having FBCB2–Blue Force Tracking (FBCB2-BFT) systems on some command and control (C2) vehicles and many helicopters (68 ground systems and 88 aviation systems). The rest of its systems were the Army's standard issue—they relied on mobile subscriber equipment (MSE) and near-term digital radio (NTDR) legacy equipment for communications and the All Source Analysis System (ASAS) and other legacy systems for intelligence, surveillance, and reconnaissance.

¹ See the classified annexes to this monograph for further details.

² The conclusions we reach here are similar to those identified independently in Robert D. Kaplan, "The Coming Normalcy?" *The Atlantic Monthly*, Vol. 297, No. 4, April 2006, pp. 72–81.

Figure S.4
Key Factors Influencing 101st ABD Performance in Stability Operations



RAND MG593-S.4

From an organizational perspective, the 101st ABD is as an air-mobile division, comprising light infantry supported by helicopters, with about 17,000 troops total. In comparison, the Iraqi province in which they operated most heavily, Ninawah, has a population of about 2.5 million (with Mosul having a population of about 1.8 million), for a total force ratio of about 6.8 soldiers per thousand residents; historically, this ratio is at the edge of the force size needed to conduct a stability operation.³ Note that this force ratio does not include security forces that were hired, equipped, and trained by U.S. forces (regional police and new Iraqi Army forces). We do not include these forces in the force presence ratio for several reasons: First, their numbers could not be accurately ascertained because they changed significantly from month to month. Second, the reliability and experience of these forces varied significantly depending upon the unit and the time in question.

The 101st ABD also had more than \$31 million in reconstruction funding available (about \$12,400 per thousand residents), along with three engineering battalions available to support reconstruction activities. The unit also had a division complement of chaplains and military police available for liaison activities and a division complement of intelligence personnel, including tactical human intelligence (HUMINT) teams.

Before Operation Iraqi Freedom (OIF), the 101st ABD's training had focused on major combat operations. However, once those operations were over and reconstruction began, the commanders' intent rapidly switched to a focus on civil reconstruction and conducting law enforcement-like operations to provide security. Consequently, even though the unit as a whole had not trained for stability operations, the commanders of the 101st ABD were able to reorient their soldiers to conduct stability operations relatively well, without the excessive use of combat power and without generating large-scale animosity among the populace.

The reorientation of the 101st ABD included stability-specific processes that emphasized law enforcement-like patrols and "soft" raids (for example, knocking on doors rather than barging into homes), and heavy spending on reconstruction projects performed by local contractors. In addition, there was substantial command emphasis

³ James Quinlivan conducted a historical analysis of the force ratios required to conduct stability operations. He found that, historically, ratios of one to four soldiers per thousand residents were sufficient strictly for routine policing (such as in post-World War II Germany); ratios of four to ten per thousand could be adequate, but at the cost of carrying out harshly punitive actions; and ratios of ten or more per thousand were the norm for stability operations. (See "Force Requirements in Stability Operations" *Parameters*, Winter 1995, pp. 59–69.)

on social networking with tribal leaders to bring Sunni groups into the political process, making good use of reconstruction funding to do so.

Many security operations, however, had to be conducted using lengthy (usually daylong) planning cycles. Leaders of the 101st ABD had to arrange face-to-face meetings to conduct planning because of a lack of widespread real-time mobile communications. The division also had only limited voice combat net radio systems to monitor operations and respond dynamically.

From an information perspective, the 101st ABD's FBCB2-BFT systems provided significant information on units at the battalion level and higher. However, the 101st ABD had very limited real-time information on units below battalion level. Stability and counterinsurgency operations have been characterized as small-unit operations—company and below. The 101st ABD also had limited information on enemy forces and the civilian ("green") population. It had limited tools for collecting and analyzing intelligence, and the flow of information from the population appears to have decreased over time as population groups (notably Sunnis) became more hostile to the occupation.

The 101st ABD performed well in conducting reconstruction and some types of security operations. They were reportedly effective in conducting distributed patrols and "soft raids" and in initially building social networks with the population. However, raids against adaptive insurgent leaders were less effective at counter-infiltration.

The 101st ABD did have a high number of U.S. casualties per attack or coalition operation, but many local Sunnis were brought into the political process and a local multiethnic governing council was formed. From a stability perspective, the number of enemy attacks and civilian casualties remained low during the 101st ABD's deployment but increased steadily over time. As time went on, there was substantial insurgent infiltration into Mosul. Further, while Sunni groups initially took an active part in the political process, this activity lessened. The major external factors further hampering the 101st ABD's effectiveness were widespread de-Ba'athification and the Coalition Provisional Authority's (CPA's) disbanding of the Iraqi army; these decisions triggered riots and the first collapse of the Mosul police department in May 2003. Repercussions from the coalition force operations in Fallujah also lessened Sunni participation, especially given Arab media accounts of what happened there in the summer and fall of 2004.

Assessment of 3/2 SBCT Mission Effectiveness

Figure S.5 summarizes the materiel and nonmateriel factors contributing to the performance of the 3/2 SBCT in Iraq. From a technology perspective, the 3/2 SBCT enjoyed several significant advantages over the 101st ABD. It had the FBCB2–Enhanced Position Location Reporting System (EPLRS) on most platforms, allowing visibility and messaging with most tactical units. It also had a high-bandwidth satellite communications (SATCOM) network, the Interim Ku-band Satellite System (IKSS), to provide communications between the brigade’s battalion-level units and higher headquarters.

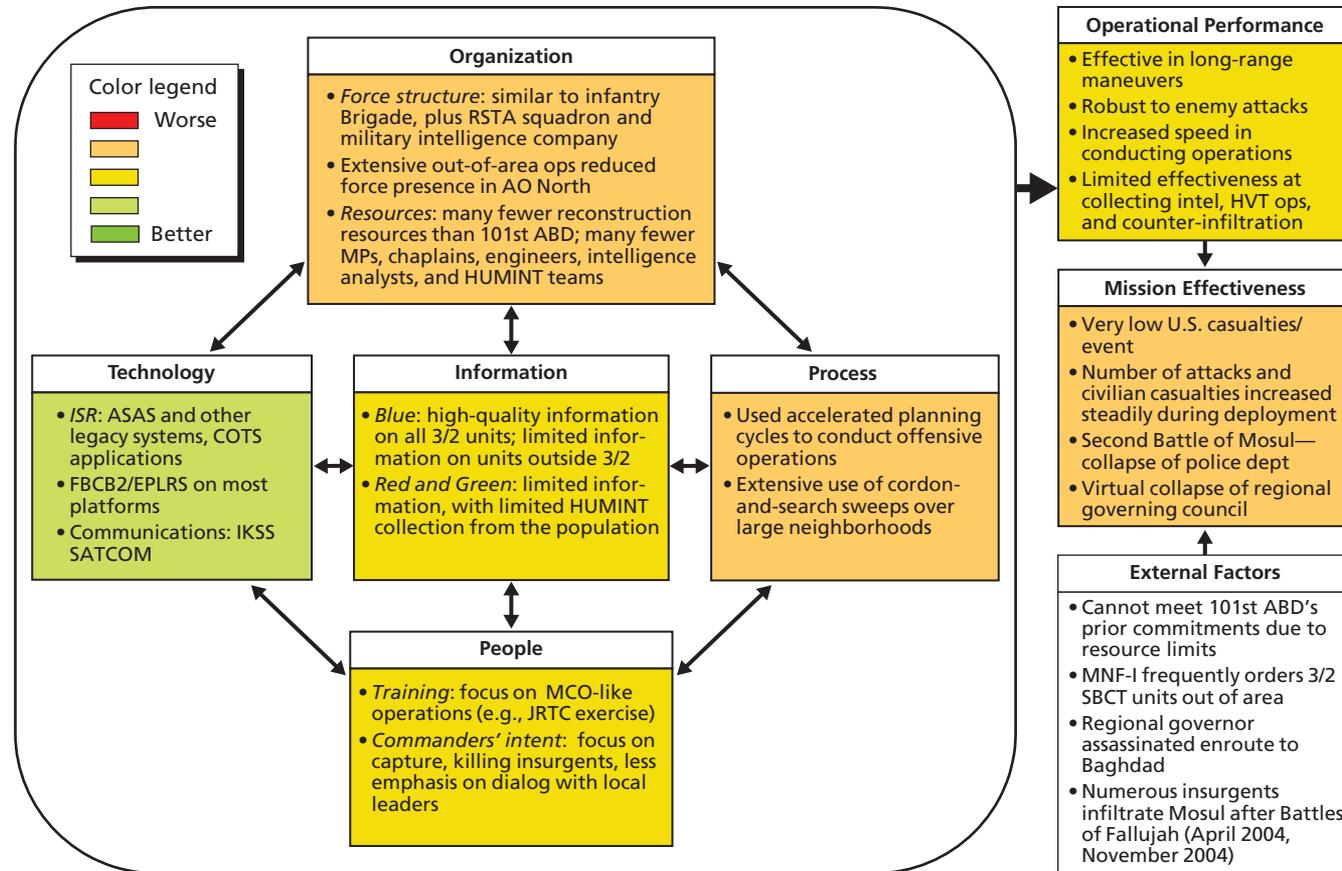
From an organizational perspective, however, the 3/2 SBCT had many fewer resources. Its structure is similar to that of an infantry brigade, with the addition of a reconnaissance, surveillance, and target acquisition (RSTA) squadron and military intelligence company—about 5,000 troops total. With respect to Ninawah province, this meant the force ratio decreased to about two soldiers per thousand residents, which is far below the level historically needed for stability operations.⁴ This ratio was further worsened by the fact that the 3/2 SBCT was the Multi-National Corps–Iraq’s (MNC-I’s) reserve force of choice, and frequently had company- or battalion-sized task forces conduct operations outside of northern Iraq. The 3/2 SBCT also had many fewer military police (MPs), chaplains, and engineers available than the 101st ABD and had many fewer intelligence analysts than a full division.

The 3/2 SBCT also had many fewer financial resources than the 101st ABD. They initially were given only a brigade-sized slice of reconstruction funding, despite being responsible for the same area of responsibility as the 101st ABD. Thus, the money initially available per thousand residents was less than one-third of what it was under the 101st ABD. Further, by the time the 3/2 SBCT was deployed to the theater, the CPA controlled nearly all reconstruction funding. The CPA was reportedly very slow to disburse reconstruction funds. This and the reduced funding resulted in the suspension or cancellation of many promised reconstruction projects. Some funding was eventually restored, and by the end of the rotation, the 3/2 reported distributing over \$15 million in reconstruction funds; however, this amount is still less than half of what it had been under the 101st ABD (\$6,000 per thousand residents versus \$12,400 per thousand).⁵

⁴ This force ratio does not include Iraqi security forces. We do not include these forces in the force presence ratio because of reasons cited above.

⁵ COL Michael Rounds, USA, “Arrowhead Brigade Combat Team in OIF I and II,” PowerPoint presentation, November 16, 2004, not available to the general public.

Figure S.5
Key Factors Influencing 3/2 SBCT Performance in Stability Operations



RAND MG593-S.5

From a people and process perspective, the 3/2 SBCT utilized major combat-like operations frequently in stability operations. When conducting these operations, it used advanced tactics, such as accelerated planning cycles for conducting offensive operations. It also used high-density FBCB2 systems to conduct dynamic C2 of operations for adaptive maneuver when deployed in out-of-area operations in central and southern Iraq. However, from a stability-specific operations perspective, the 3/2 SBCT's heavy emphasis on major combat-like operations, including frequent neighborhood sweeps, did not aid in building relations with the local population.

From an information perspective, the 3/2 SBCT had significant information on all units within the brigade down to the tactical level, although it continued to have limited information on units outside the 3/2 SBCT. Information on enemy forces and the civilian population continued to be low, with limited information collected from the population.

The 3/2 SBCT performed well in major combat-like operations when they were needed, including long-range maneuvers for out-of-area operations. It accelerated cycle times for conducting offensive operations and responded effectively to enemy attacks. However, the SBCT's limited effectiveness at collecting intelligence from the population hampered efforts at counter-infiltration and its conduct of targeted operations or raids against high-value targets. In addition, many of its cordon and search-and-sweep operations of Mosul neighborhoods appear to have been counterproductive and probably generated considerable resentment and distrust of coalition forces.

Consequently, with respect to effectiveness, we assess that the 3/2 SBCT did well on key MCO measures, such as casualties—it had extremely low U.S. casualties per event. However, with respect to security objectives for stability operations, the number of attacks and civilian casualties increased steadily throughout the deployment, culminating in the collapse of local police forces in Mosul shortly after the 3/2 SBCT's deployment (November 2004) and in the de facto collapse of the regional governing council earlier in 2004. The 3/2 SBCT's effectiveness was also dramatically hampered by two external factors. First, the 101st ABD had made many commitments to local residents and leaders concerning reconstruction projects; but without the 101st ABD's resources, the 3/2 SBCT could not honor these commitments, leading to significant resentment. Second, the first and second battles of Fallujah in 2004 strongly degraded security in Mosul, both due to Sunni outrage at the battles and at the perceived treatment of Sunni civilians in Fallujah and to the thousands of insurgents who fled Fallujah and set up operations in Mosul.

Assessment of 1/25 SBCT Mission Effectiveness

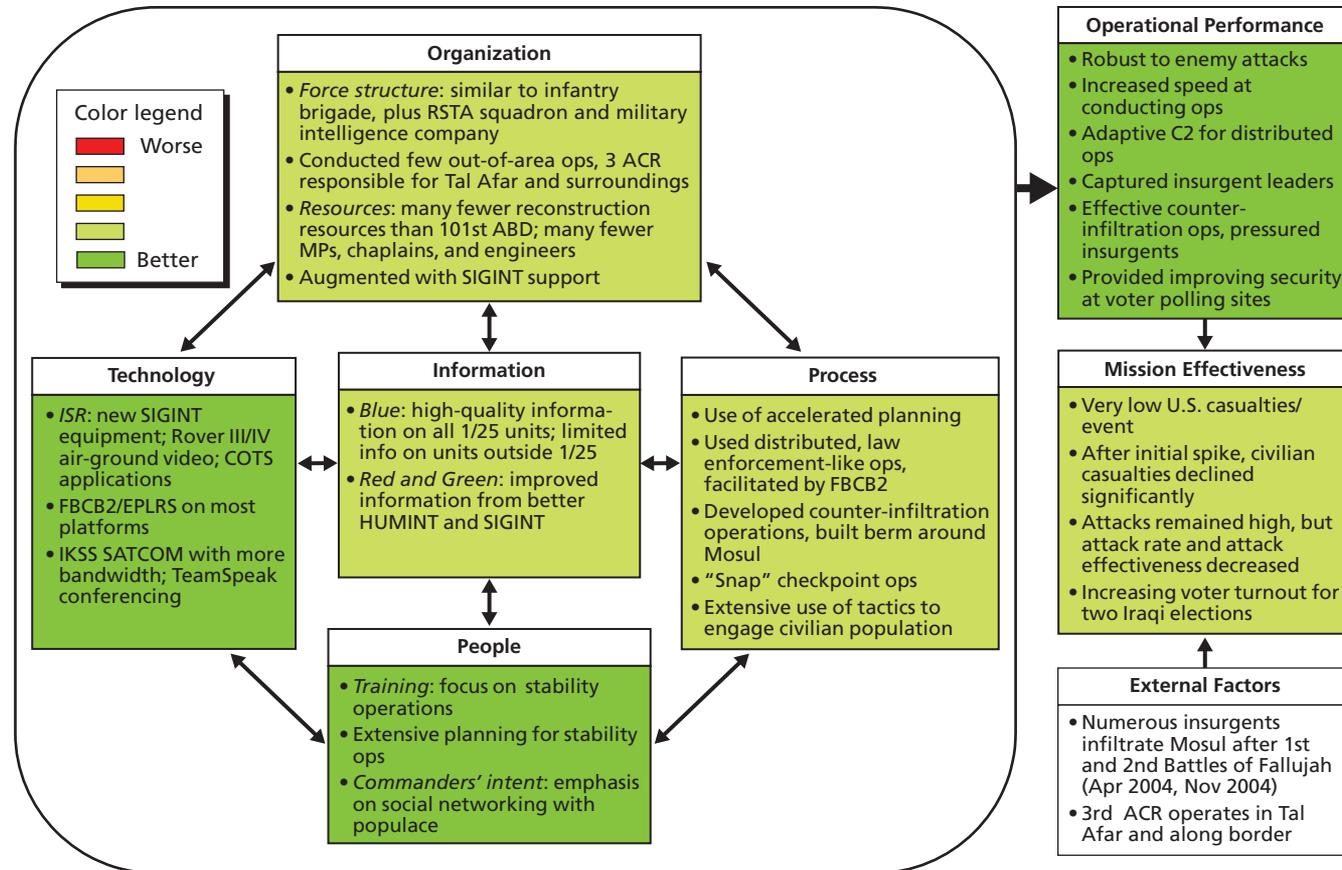
Figure S.6 summarizes the factors contributing to the 1/25 SBCT's performance in stability operations. From a technology perspective, the 1/25 SBCT began with the 3/2 SBCT's complement of FBCB2 and IKSS SATCOM and added several improvements. For intelligence, surveillance, and reconnaissance (ISR), the unit had new signals intelligence (SIGINT) equipment and Rover III/IV systems, providing a video link between air platforms and ground commanders. For communications, the unit added "TeamSpeak" voice-over-IP conferencing, which allowed all battalion-level units to participate in commanders' conferences. The 1/25 SBCT was also augmented with new networked SIGINT capabilities.

From an organizational perspective, the 1/25 SBCT had many fewer troops than the 101st ABD and lacked the division's reconstruction resources (the 1/25 SBCT, too, had only a brigade-sized share of reconstruction funds); however, it was not stretched as thin as the 3/2 SBCT. The 1/25 SBCT conducted few out-of-area operations, and substantial portions of another unit (the 3rd Armored Combat Regiment [ACR]) operated in Tal Afar and provided security along the Iraqi-Syrian border in Ninawah province during the latter half of the 1/25 SBCT's deployment, enabling the 1/25 SBCT to focus on Mosul and surrounding towns. Thus, the force presence ratio in Ninawah province increased from about two soldiers per thousand residents at the beginning of the 1/25 SBCT's rotation to about four soldiers per thousand at the end of its rotation. However, because the majority of the population of the province lived in Mosul, the 1/25 SBCT force presence ratio in the city was still about 2.8 soldiers per thousand residents.⁶

From a people perspective, both the training of personnel and the commanders' intent focused heavily on stability operations. Unlike the other two units, the 1/25 SBCT benefited from stability operations training in the United States prior to deployment. Like the 101st ABD, the 1/25 SBCT processes emphasized social networking tactics to engage the civilian population. It used distributed, law enforcement-like operations, with the dynamic C2 of these operations aided by FBCB2. It also

⁶ As before, this force ratio does not include Iraqi security forces.

Figure S.6
Key Factors Influencing 1/25 SBCT Performance in Stability Operations



RAND MG593-S.6

developed additional counter-infiltration processes, such as extensive use of randomized checkpoint operations (“snap” traffic control points), constructed a berm around the entire city of Mosul, and provided real-time surveillance of the berm to capture insurgents attempting to infiltrate the city. In addition, the 1/25 SBCT retained the 3/2 SBCT’s accelerated planning and dynamic C2 capabilities, which were judged to be important in minimizing casualties.

From an information perspective, the 1/25 SBCT, like the 3/2 SBCT, had significant information on its units and limited information on outside units. It also had significantly improved information on enemy forces and the local population because of a significant increase in HUMINT, tips from the local population, and greatly enhanced SIGINT capabilities.

The 1/25 SBCT performed the security aspects of stability operations well and effectively supported local governance. Like the 3/2 SBCT, the 1/25 SBCT conducted offensive operations significantly faster and was robust against enemy attacks. The 1/25 SBCT used its dynamic mobile C2 for conducting distributed small-unit operations and could immediately redirect forces to offensive opportunities without advance planning. The 1/25 SBCT was effective at a variety of counter-infiltration operations and operations against high-value targets, putting significant pressure on insurgents and capturing two levels of insurgent leadership in Mosul. The 1/25 SBCT also provided improved security at voter polling sites during 2005. Equally important, it helped to reestablish political dialog between different ethnic groups and tribes.

Consequently, with respect to overall mission effectiveness and taking into account the larger and more lethal insurgency present in Iraq at the *start* of the 1/25 SBCT rotation, we assess the 1/25 SBCT as being effective at all aspects of stability operations addressed in this study: It contributed positively to political progress by reestablishing a multiethnic regional governing council. After an initial spike, civilian casualties declined significantly, enemy attacks declined by a small amount, and these attacks became much less effective. The 1/25 SBCT defeated a major insurgent offensive to seize Mosul, despite the infiltration of thousands of insurgents into the city after the first and second battles of Fallujah, and provided effective security for two Iraqi elections. Like the 3/2 SBCT, the 1/25 SBCT had very low U.S. casualties per event.

In summary, the 1/25 SBCT significantly improved the security situation in Mosul. Indeed, Robert Kaplan, an experienced war correspondent who traveled with elements of the 1/25 SBCT, wrote that normalcy seemed to be coming to Mosul and the surrounding area:

Mosul is a success story, although the success is relative, partial, and tenuous. The credit for what success there has been belongs to one of the U.S. Army's Stryker brigade combat teams that recently departed Iraq: the 1st Brigade of the 25th Infantry Division.⁷

Role of NCO Capabilities in Improving Force Effectiveness in Stability Operations

Our analysis indicates that command leadership, training, and TTPs, or the processes employed in stability operations, are just as important as networking technologies in improving mission effectiveness in stability operations.

We found the 1/25 SBCT and 101st ABD performed best overall in the stability phase in northern Iraq. The 101st ABD and 1/25 SBCT employed some of the same TTPs that were important in capturing insurgents and, for the 1/25 SBCT, in capturing high-level insurgent leaders. In the case of the 1/25 SBCT, these operations were carried out using digital networking and intelligence systems at the lowest tactical level. The 3/2 SBCT did not perform as well as the 1/25 SBCT, even though it was equipped with some of the same digital networking capabilities. Some of the TTPs the 3/2 SBCT employed, such as sweeps, widened the gulf between coalition forces and the local populace. In some cases, these tactics may have caused some Iraqi civilians to side with the insurgency. From this we can surmise that the benefits of networking technologies can be overridden by TTPs that are counterproductive in stability operations.

Equally important was effective social networking with the local populace and civilian leaders. Again, the 101st ABD and the 1/25 SBCT were the most effective in achieving political progress. Commanders of both the 1/25 SBCT and the 101st ABD emphasized social networking. Most social networking with the Iraqi populace and local leadership appears to have been carried out in face-to-face conversations and meetings. Military networking technologies had a minimal role here.

Many external factors, including the availability of reconstruction funds, affected the complex and changing political and security situation in northern Iraq. All three units were subject to such external factors, which were beyond their control. In this

⁷ Kaplan, 2006.

regard, the two Stryker brigades were at a clear disadvantage relative to the 101st ABD. They had reduced funding for reconstruction and fewer key liaison personnel (military police and chaplains), and they experienced other problems that either worsened the security situation or worsened how the coalition forces were perceived by the populace.

Finally, even with the deployment of the 3rd ACR to Ninawah province in the latter part of 2005, the 1/25 SBCT had a force presence ratio of only about 2.8 per thousand in Mosul, less than half what the 101st ABD had in the province as a whole. In this regard—“boots on the ground”—the 3/2 SBCT was at the greatest disadvantage of the three units. Nevertheless, given the smaller size of the 1/25 SBCT and the challenging security environment it inherited from its predecessors in northern Iraq, the performance of the 1/25 SBCT is remarkable.

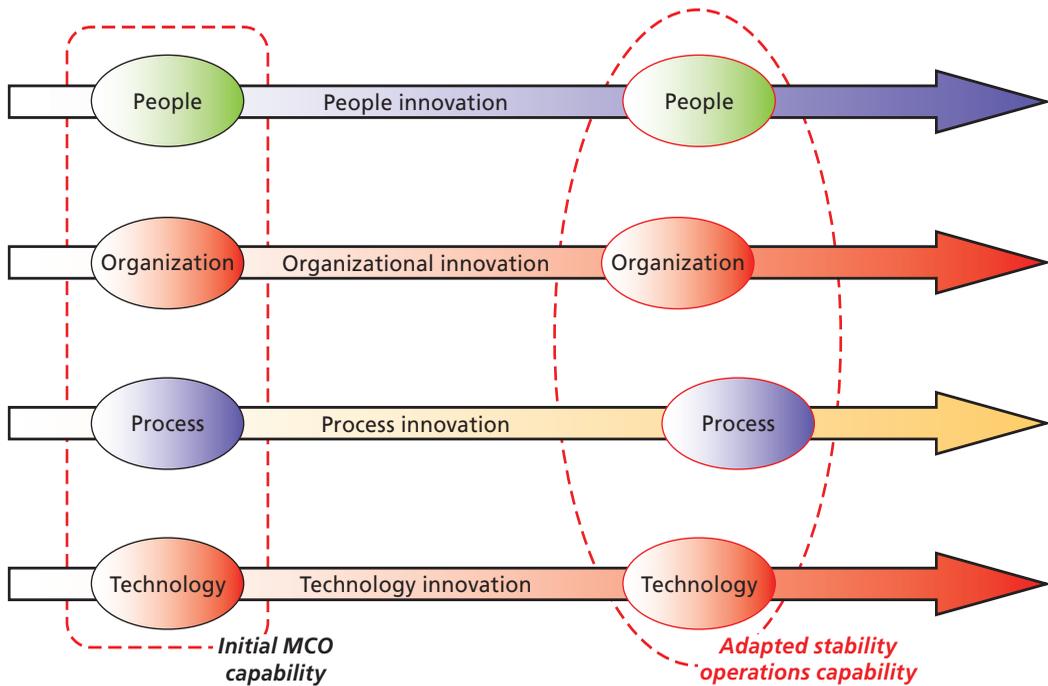
We cannot quantify and isolate the contribution to overall military-unit mission effectiveness of organizations, processes, people, digital networking technology, armor, or external factors. Nevertheless, our analysis indicates that NCO capabilities made an important contribution at the tactical level to mission performance in many areas. When we “integrate,” or add the results of these discrete individual tactical operations together, we find that NCO capabilities can contribute to a significant improvement to the mission effectiveness of military units in the security-mission component of stability operations (Figure S.7).

The importance of NCO capabilities in the stability operations of the 1/25 SBCT was also noted by Kaplan:

New hardware . . . plays a big role, facilitating a change in the relationships between captains in the field and majors and lieutenant colonels back at battalion headquarters. . . . a computer system that gives captains and noncommissioned officers situational awareness and the latest intelligence for many miles around—has helped liberate field units from dependence on headquarters.

Autonomy is further encouraged by the flat “intelligence architecture” of the Stryker brigades. Information now comes to captains less and less from battalion headquarters, and more and more from other junior officers in other battalions, via informal e-mail networks, as well as directly from Iraqi units. The lieutenant colonel who commands an infantry battalion, and the major who is the captain’s

Figure S.7
Adaptation of Materiel and Nonmateriel NCO Force Elements



RAND MG593-S.7

executive officer, do not always have to be consulted. Given the results, the commanding officers like it that way.⁸

Kaplan is describing classic findings in the NCO literature—the ability of networked forces to become more responsive, more adaptive, and able to make effective command decisions at lower levels without waiting for intelligence and other information to flow up to higher headquarters and down again.⁹ Earlier, we used terminology

⁸ Kaplan, 2006.

⁹ See, for example, David S. Alberts et al., *Understanding Information Age Warfare*, Washington D.C.: CCRP Publication Series, August 2001; and David S. Alberts and Richard E. Hayes, *Power to the Edge: Command and Control in the Information Age*, Washington, D.C.: CCRP Publications Series, 2003. Earlier discussions of flattened decision, production, and supply chain networks can also be found in the reengineering business literature.

borrowed from the NCO literature to describe the same advantages of NCO systems noted by Kaplan—small-unit self-synchronization, swarming, and adaptive command and control.

Summary of Network and Intelligence Capabilities

A summary of the 101st ABD, 3/2 SBCT, and 1/25 SBCT networks is shown in Table S.2. There were significant differences among all three networks. The 1/25 SBCT’s

Table S.2
Summary of SBCT Networking and Battle Command Enhancements

	101st ABD	3/2 SBCT	1/25 SBCT
FBCB2/BFT on AVN	40 AH-64 30 UH-60 12 CH-47 82 total	On helicopters supporting 3/2	On helicopters supporting 1/25
FBCB2/BFT per infantry brigade on C2 vehicles	5–8	13	13
FBCB2/EPLRS on ground vehicles			
Stryker vehicles	0	317	317
Other vehicles	0	~280	~280
Reliance on MSE/NTDR for brigade–battalion communications	Yes	No	No
IKSS SATCOM terminals	0	10	10
TeamSpeak/SIPRNET for brigade battle update brief	No	No	Yes 50–80 participants
Access to Rover III communications terminals	No	No	Yes Batallion level
Fiber-optic links	No	No	Yes Brigade TOC– battalion TOC– company TOC
PDA’s or “CSI Mosul” information	0	0	Some infantry soldiers

 Factor with a relative disadvantage  Factor with a relative advantage

network was considerably more capable, especially from a joint operations perspective.¹⁰

Intelligence Capabilities

Intelligence challenges associated with the Iraqi insurgent and terrorist forces required most Army units to employ new intelligence analysis approaches and new tools to analyze the composition of insurgent groups. Many of the intelligence capabilities of the 101st ABD and the 3/2 SBCT were very similar. They both used standard Microsoft Office products to do much of this analysis because Army MCO-focused intelligence tools were less useful for stability operations.

The 1/25 SBCT had additional intelligence capabilities the other two units did not possess, including software tools from the law enforcement community that were adapted to analyzing insurgent networks. The 1/25 SBCT was also able to make effective use of joint and national ISR capabilities to a much greater extent than a traditional light infantry brigade could. The integration of these ISR sources was made possible by having appropriately trained and cleared personnel at the brigade level and by new system capabilities.¹¹ While these joint and national ISR sources were not new, their effective integration into tactical operations in real time was. The ability to use the information they generated in real time, using networks, led to significant operational performance improvements, as described in the classified addendum to this monograph. The additional intelligence capabilities of the 1/25 SBCT, along with its NCO capabilities, enabled it to effectively exploit precise but perishable actionable intelligence.

Caveats

As noted earlier, Stryker brigades are equipped with medium-weight armored vehicles, while the 101st ABD is equipped with predominantly soft-skinned vehicles. However, only about half the SBCT vehicles are Stryker vehicles. The other half are HMMWVs like those used in light infantry units. Up-armored HMMWVs were distributed to the

¹⁰ SBCT units are supported by UH-60 and OH-58 Kiowa Warrior helicopters (see Tonya K. Townsell, "Enhancements in Store for Future Stryker brigades," *Army Communicator*, Winter 2003). The number of helicopters assigned to the SBCTs (and thus the number of FBCB2-BFT systems on avionics platforms) varied, although this number was always far less than the number in the 101st ABD. For example, the 3/2 SBCT initially had only four UH-60 helicopters supporting it; the number increased by ten by the end of the unit's deployment. The 3/2 SBCT was also supported with 24 OH-58D Kiowa Warrior reconnaissance helicopters by the end of the deployment (Rounds, 2004).

¹¹ A description of these ISR integration capabilities is included in the classified annexes to this report.

3/2 and 1/25 SBCTs but were not available to the 101st ABD in 2003. While this armor protection provided a force protection advantage for the SBCTs relative to the 101st ABD, it should be noted that many Stryker engagements were fought dismounted (for example, raids against high-value targets). Furthermore, insurgents frequently targeted armored vehicles in improvised explosive device (IED) attacks and designed IEDs to maximize their effectiveness against armored vehicles. Insurgents also targeted logistics convoys, many of which are composed of trucks and HMMWVs. To counter the IED threat, U.S. forces deployed to Iraq in 2004 and later (including the 3/2 and 1/25 SBCTs but not the 101st ABD) were equipped with electronic counter measures such as Warlock and the IED Countermeasures Equipment (ICE) system. These systems have contributed to increased force protection capability in mounted and dismounted operations throughout Iraq. For these reasons, the difference in casualty rates between the two SBCT units and the 101st ABD is probably due to multiple factors. However, it is interesting to note that casualty rates for the 3/2 and 1/25 SBCTs are significantly less than other U.S. units that operated in Iraq during the same time periods, when up-armored HMMWVs, Warlock, and ICE systems were available to many if not all U.S. units (see Figure S.2).

We recognize armor is an important factor contributing to the mission effectiveness of the Stryker brigade. However, many factors contribute to Stryker brigade effectiveness, such as the Stryker vehicle's mobility and its NCO capabilities. The mobility of the Stryker vehicle gives the SBCT the speed and agility to rapidly respond to changes in the battlespace that are represented in the common operational picture provided through the network. The Stryker vehicle also delivers more firepower than light infantry units typically have, but it is not clear that this firepower was a dominant or even an important factor in many stability operations. We do know the vehicle is used effectively as protection against enemy fire. In this study, it was not possible to isolate the contributions of individual attributes (either armor or the capabilities of the Stryker information network) to the observed increase in force effectiveness and force protection.

Additional Findings

We did note two specific challenges and shortcomings:

Ninawah province and its 2.5 million residents appear to be too large to be covered by a single brigade. More "boots on the ground" were needed. The 3/2 and 1/25 SBCTs

were unable to effectively conduct stability operations in Ninawah province without assistance from other units.

It is exceedingly difficult for a military unit to conduct stability operations in one area while being tasked to frequently conduct out-of-area operations. A continuous force presence in Mosul and Tal Afar were difficult to sustain by the 3/2 SBCT because of extensive out-of-area operations. Social networking with local populace and leaders is degraded when commanders and soldiers are not able to “settle down” in a particular neighborhood or town and get to know the local politics and cultural background.

Army Battle Command Systems and Stability Operations

All units encountered significant challenges in using the Army Battle Command Systems (ABCS) at command centers for situation awareness of the enemy and the local population. Traditional “red icons” depicting the location and capabilities of enemy units did not match well to tracking the activities of insurgents. Similarly, ABCS lacked forms or displays suited for tracking developments with the local population (demonstrations, results of personal contacts, etc.). As a result, much information was transmitted using text messaging and text chat, which could not automatically populate databases and situation awareness screens. Some ABCS, notably ASAS and the Maneuver Control System–Heavy, were considered to be unsuitable for stability operations and were largely not used. The use of FBCB2 text messaging, while useful at the tactical level, could also sometimes result in key messages about engagements not being reviewed by personnel at the brigade tactical operations center.

Language and Culture

SBCT soldiers frequently requested additional linguists (linguists who both spoke and wrote Arabic fluently and could be fully trusted were in short supply), even to provide simple open-source intelligence functions such as reading Iraqi media. There were also requests for more language and cultural training.

Recommendations

We recommend several net-centric capability improvements.

BFT and Battle Command Systems

- *Field FBCB2, or FBCB2-compatible systems, on a wide scale at the tactical level.* The FBCB2 system was a key enabler of the improved situation awareness, speed of command, and synchronization of SBCT units. The system is deployed widely enough in Stryker units to make it a key capability for SBCT tactical units, as opposed to being merely a tool for senior commanders. We recommend that FBCB2, or FBCB2-compatible systems, be widely deployed at the tactical level throughout Army and Marine Corps units, as well as to key coalition partners such as the United Kingdom and Australia.
- *Add classes or message address lists to FBCB2, and ensure that messaging a class is the standard when reporting engagements.* This subject is discussed in the classified annexes to this document.
- *Expand FBCB2's preformatted reports to include more stability operations–related reports and make them easier to use.* Add report templates for demonstrations, suspicious activities, relations between suspects, patrol debriefs, and results of informal and formal meetings.
- *Provide battle command devices or at least BFT devices to dismounted units.* SBCT soldiers requested the auto-population of dismount locations on FBCB2, at least down to the team level.

Red Force and Cultural Awareness

- *Provide a common suite of analysis tools for performing pattern, link, and temporal analyses of tactical stability operations.*
- *Relax procedures for disseminating HUMINT to provide actionable information to those soldiers needing it.*
- *Provide additional training.* Soldiers requested additional training on the processing of material collected from operations, tactical questioning, and general cultural awareness. They also requested training on civil affairs, languages, information operations, negotiation, and HUMINT.