

REPORT DOCUMENTATION PAGE**Form Approved**
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Washington Headquarters Service, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington, DC 20503.

PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.

1. REPORT DATE (DD-MM-YYYY) 05-04-2011		2. REPORT TYPE Master of Military Studies Research Paper		3. DATES COVERED (From - To) September 2010 - April 2011	
4. TITLE AND SUBTITLE Amphibious Operations: Ensuring Capabilities to Assure Access				5a. CONTRACT NUMBER N/A	
				5b. GRANT NUMBER N/A	
				5c. PROGRAM ELEMENT NUMBER N/A	
6. AUTHOR(S) O'Brien, William, E., Major, USMC				5d. PROJECT NUMBER N/A	
				5e. TASK NUMBER N/A	
				5f. WORK UNIT NUMBER N/A	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) USMC Command and Staff College Marine Corps University 2076 South Street Quantico, VA 22134-5068				8. PERFORMING ORGANIZATION REPORT NUMBER N/A	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A				10. SPONSOR/MONITOR'S ACRONYM(S) N/A	
				11. SPONSORING/MONITORING AGENCY REPORT NUMBER N/A	
12. DISTRIBUTION AVAILABILITY STATEMENT Unlimited					
13. SUPPLEMENTARY NOTES N/A					
14. ABSTRACT The ability to project power from the sea is essential to secure United States national interests. The policies that necessitate US involvement within the littorals require a materiel solution to meet these strategic ends. It is in US national interests to possess the capability to transit the littorals from the high seas to inland objectives with a self-deploying amphibious vehicle in order to deter and respond to global crises across the range of military operations from the benign to the non-permissive environment. The United States as a nation with global reach must retain the ability to project power within the littorals. The Marine Corps' capability to conduct assured access operations requires a system that is adept at missions across the range of military operations to meet the threats presented now and in the future.					
15. SUBJECT TERMS Expeditionary Maneuver Warfare, Operational Maneuver from the Sea, Ship to Objective Maneuver, Amphibious Operations, Littoral Access, Assured Access, Enhanced MAGTF Operations, Amphibious Vehicles, Armored Vehicles					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 36	19a. NAME OF RESPONSIBLE PERSON Marine Corps University / Command and Staff College
a. REPORT Unclass	b. ABSTRACT Unclass	c. THIS PAGE Unclass			19b. TELEPHONE NUMBER (Include area code) (703) 784-3330 (Admin Office)

INSTRUCTIONS FOR COMPLETING SF 298

1. REPORT DATE. Full publication date, including day, month, if available. Must cite at least the year and be Year 2000 compliant, e.g., 30-06-1998; xx-08-1998; xx-xx-1998.

2. REPORT TYPE. State the type of report, such as final, technical, interim, memorandum, master's thesis, progress, quarterly, research, special, group study, etc.

3. DATES COVERED. Indicate the time during which the work was performed and the report was written, e.g., Jun 1997 - Jun 1998; 1-10 Jun 1996; May - Nov 1998; Nov 1998.

4. TITLE. Enter title and subtitle with volume number and part number, if applicable. On classified documents, enter the title classification in parentheses.

5a. CONTRACT NUMBER. Enter all contract numbers as they appear in the report, e.g. F33615-86-C-5169.

5b. GRANT NUMBER. Enter all grant numbers as they appear in the report, e.g. 1F665702D1257.

5c. PROGRAM ELEMENT NUMBER. Enter all program element numbers as they appear in the report, e.g. AFOSR-82-1234.

5d. PROJECT NUMBER. Enter all project numbers as they appear in the report, e.g. 1F665702D1257; ILIR.

5e. TASK NUMBER. Enter all task numbers as they appear in the report, e.g. 05; RF0330201; T4112.

5f. WORK UNIT NUMBER. Enter all work unit numbers as they appear in the report, e.g. 001; AFAPL30480105.

6. AUTHOR(S). Enter name(s) of person(s) responsible for writing the report, performing the research, or credited with the content of the report. The form of entry is the last name, first name, middle initial, and additional qualifiers separated by commas, e.g. Smith, Richard, Jr.

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES). Self-explanatory.

8. PERFORMING ORGANIZATION REPORT NUMBER. Enter all unique alphanumeric report numbers assigned by the performing organization, e.g. BRL-1234; AFWL-TR-85-4017-Vol-21-PT-2.

9. SPONSORING/MONITORS AGENCY NAME(S) AND ADDRESS(ES). Enter the name and address of the organization(s) financially responsible for and monitoring the work.

10. SPONSOR/MONITOR'S ACRONYM(S). Enter, if available, e.g. BRL, ARDEC, NADC.

11. SPONSOR/MONITOR'S REPORT NUMBER(S). Enter report number as assigned by the sponsoring/ monitoring agency, if available, e.g. BRL-TR-829; -215.

12. DISTRIBUTION/AVAILABILITY STATEMENT. Use agency-mandated availability statements to indicate the public availability or distribution limitations of the report. If additional limitations/restrictions or special markings are indicated, follow agency authorization procedures, e.g. RD/FRD, PROPIN, ITAR, etc. Include copyright information.

13. SUPPLEMENTARY NOTES. Enter information not included elsewhere such as: prepared in cooperation with; translation of; report supersedes; old edition number, etc.

14. ABSTRACT. A brief (approximately 200 words) factual summary of the most significant information.

15. SUBJECT TERMS. Key words or phrases identifying major concepts in the report.

16. SECURITY CLASSIFICATION. Enter security classification in accordance with security classification regulations, e.g. U, C, S, etc. If this form contains classified information, stamp classification level on the top and bottom of this page.

17. LIMITATION OF ABSTRACT. This block must be completed to assign a distribution limitation to the abstract. Enter UU (Unclassified Unlimited) or SAR (Same as Report). An entry in this block is necessary if the abstract is to be limited.

*United States Marine Corps
Command and Staff College
Marine Corps University
2076 South Street
Marine Corps Combat Development Command
Quantico, Virginia 22134-5068*

MASTER OF MILITARY STUDIES

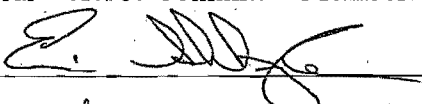
AMPHIBIOUS OPERATIONS: ENSURING CAPABILITIES TO ASSURE ACCESS

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF MILITARY STUDIES

Major William E. O'Brien, USMC

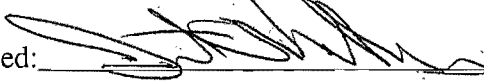
AY 10-11

Mentor and Oral Defense Committee Member: Dr. Eric Y. Shibuya, Ph.D.

Approved: 

Date: 5 April 2011

Oral Defense Committee Member: Dr. Jonathan F. Phillips, Ph.D.

Approved: 

Date: 5 April 2011

DISCLAIMER

THE OPINIONS AND CONCLUSIONS EXPRESSED HEREIN ARE THOSE OF THE INDIVIDUAL STUDENT AUTHOR AND DO NOT NECESSARILY REPRESENT THE VIEWS OF EITHER THE MARINE CORPS COMMAND AND STAFF COLLEGE OR ANY OTHER GOVERNMENTAL AGENCY. REFERENCES TO THIS STUDY SHOULD INCLUDE THE FOREGOING STATEMENT.

QUOTATION FROM, ABSTRACTION FROM, OR REPRODUCTION OF ALL OR ANY PART OF THIS DOCUMENT IS PERMITTED PROVIDED PROPER ACKNOWLEDGEMENT IS MADE.

TABLE OF CONTENTS

Disclaimer.....	i
Table of Contents.....	ii
Executive Summary.....	iii
Preface.....	iv
Introduction.....	1
Littoral Access.....	6
Operating Concepts and Competencies.....	8
Concept Requirements.....	10
Armored Vehicles in Irregular Warfare.....	17
Conclusion.....	20
Tables.....	22
Endnotes.....	24
Bibliography.....	28

EXECUTIVE SUMMARY

Title: Amphibious Operations: Ensuring Capabilities to Assure Access

Author: Major William E. O'Brien, USMC

Thesis: The ability to project power from the sea is essential to secure United States national interests. The policies that necessitate US involvement within the littorals require a materiel solution to meet these strategic ends. It is in US national interests to possess the capability to transit the littorals from the high seas to inland objectives with a self-deploying amphibious vehicle in order to deter and respond to global crises across the range of military operations from the benign to the non-permissive environment.

Discussion: Government fiscal concerns, doctrinal changes and ongoing operations in Afghanistan have made the task of ensuring the US possesses the proper equipment to assure access more challenging. Naval operations involving the projection of military power from the sea to inland objectives is a core competency the Marine Corps must be able to conduct. The challenges in the littorals have been and continue to be a concern for amphibious operations. Global trends predict ever increasing urban population strain within regions of instability, the increasing strain on limited resources, the proliferation of anti-access weapons, and the decreased willingness of states adjacent to crises areas to allow the US access to their territory, make all that more significant the transition through the littorals.

Conclusion: The United States as a nation with global reach must retain the ability to project power within the littorals. The Marine Corps' capability to conduct assured access operations requires a system that is adept at missions across the range of military operations to meet the threats presented now and in the future.

PREFACE

Numerous national defense documents from the National Military Strategy, Joint Operating Environment, Marine Corps and Navy Operating Concepts publications, Marine Corps Strategic Vision Group, Marine Corps Vision and Strategy 2025, the 35th Commandant's Planning Guidance, and others refer to the importance of littoral access. Since 2003 until recently, the United States and its coalition partners have been fighting in Afghanistan and Iraq—two predominantly land locked countries.

These two conflicts have dominated the national discussion and media attention with minimal notice to other maritime and amphibious operations that occur on a regular basis. The focus of national interest on winning the current fight is justifiable. However, we cannot forget global trends that are taking place. For the United States to remain a viable and relevant global security partner we must train, equip, and staff our military for the likelihood that global instability will continue to occur, specifically along the littorals, and we must be capable to assure access to these flare up points.

As an Assault Amphibian Officer, I am often frustrated by the hollow talk of assuring littoral access and rapidly responding to crises across the range of military operations around the globe. We espouse our ability to project power from the sea yet we continue to execute it as we did during World War II. The delay in modernizing the primary platform used to build rapidly sustainable combat power ashore further demonstrates that we are uncommitted to our vision and fail to recognize the critical role maritime forces play in addressing this uncertainty.

The goal of this paper is to indentify some areas where the Marine Corps can make changes to enhance the ability of the Marine Air Ground Task Force (MAGTF) to conduct

Enhanced MAGTF Operations and accomplish the Marine Corps' core mission. An additional objective of this paper is to initiate thought and discussion about the need to evaluate future requirements that will ensure the surface assault elements are equipped to best support the MAGTF across the range of military operations.

INTRODUCTION

“Security is like oxygen: you tend not to notice it until you lose it.”¹ – Joseph S. Nye Jr.

The future security environment that faces the United States requires members of government, academia, the media, and even the public to give due diligence in its study to succeed within it. The *Joint Operating Environment* of 2010 paints a picture of security wrought with uncertainty ranging from benign to non-permissive crises to highlight the context in which planners need to consider as solutions are forged. To further this point, the *Joint Operating Environment* of 2010 states, “The next quarter century will challenge US joint forces with threats and opportunities ranging from regular and irregular wars in remote lands, to relief and reconstruction in crisis zones, to cooperative engagements in the global commons.”² To be successful in this the United States must possess a viable materiel solution that provides the capability to assure access.

Current economic conditions have exacerbated the challenge of posturing US forces for this future environment. The pressure has forced the Department of Defense to take a critical look at how tax dollars are spent. The increasing budgetary constraints have prompted action by the Secretary of Defense to announce fiscal reforms designed to introduce efficiencies leading to spending reductions. In a January 2011 statement given to the Pentagon, Defense Secretary Gates outlined several measures to be taken within the Department to reduce overhead costs, minimize staff positions, dissolve excess commands, and reduce military and federal employees, as well as cancel several military programs in development. One of these programs is the Expeditionary Fighting Vehicle (EFV) program.³ Cutting the EFV is an understandable cost saving measure. However, what is lost in terms of capability needs to be investigated.

A delicate balancing act must occur as the Department of Defense grapples with operating in this austere environment, a balance between current operational needs fighting against Taliban and Al Qaeda forces in Afghanistan and a vision designed to equip US forces with the necessary tools for the future. The Secretary was quite clear in dispelling concerns about his decision to cancel the EFV program as it relates to the Marine Corps' mission. "This decision [to cancel the EFV program] does not call into question the Marines' amphibious assault mission."⁴ Though the Marine Corps has embarked on the procurement of a new materiel solution, the Amphibious Combat Vehicle, the likelihood of a functional platform in three and a half to four years⁵ is overly optimistic considering the complexities involved within the Department of Defense acquisition process. The decision then to cancel the EFV relegates the Marine Corps to conduct amphibious operations with an antiquated system for the next 10 to 20 years.

Is the United States accepting risk at the expense of future maritime security capabilities? Is it failing to accept the fact that population growth trends along the littorals are ever increasing and that these trends reside within regions of instability? Will the Marine Corps be postured with the equipment necessary to meet future challenges? If the United States does not fill the role, then who will fill the power vacuum? These rhetorical questions are intended to highlight the criticality of the US involvement in the global arena: economically, diplomatically, and militarily. The US is an active participant in global affairs that contribute to global security as highlighted by the *Joint Operating Environment*.

The globalization of the world brings with it an increased "interdependence between nations placing a premium on access to the world's commons - land, sea, air, space and cyber. These five domains converge in the littorals where a majority of the world's population lives in

close proximity to the sea.”⁶ The United Nations World Urbanization Prospects cites that by the 2030s, 5 billion of the world’s 8 billion people will reside in the cities, and 2 billion of those will live in the urban slums of the Middle East, Africa, and Asia.⁷ As population centers bulge around the impoverished urban periphery, stressing urban infrastructure, the potential for social disorder increases. Belligerents may well exploit this opportunity to grow, making the challenges of maintaining order increasingly more difficult. These areas will be the seedbed for crises.

The United States is a maritime nation inextricably linked to its ability to project power via the sea. The maneuver space afforded by this domain has allowed the US to influence, deter, and if necessary, project power in the pursuit of national interests. The ability to project power from the sea is critical in ensuring a credible threat to potential adversaries. A viable assured access capability is a critical component of the US National Security Strategy.⁸

The international resistance to support US operations overtly further reinforces and validates the construct of operational-maneuver-from-the-sea. For example in 2003 the Turkish parliament opposed having Turkey serve as a northern flank from which the US 4th Infantry Division could attack into Iraq. The Navy and Marine Corps operating concepts are critical in conducting successful maritime operations considering the likelihood of continued resistance by neighboring states adjacent to crises areas. The capability to project power from the sea, by means of force if necessary, is paramount as this support continues to erode. Lieutenant General George J. Flynn, Commanding General, Marine Corps Combat Development Command, stated, “[O]ur ability to come from the sea and overcome the challenges of natural manmade barriers allows us to protect and defend U.S. interests. Our continued ability to respond is dependent on our ability to operate in uncertain environments, create opportunities and ensure freedom of

action regardless of access challenges.”⁹ To create these opportunities, a viable capability must exist.

The littorals, the region of transition between the global commons and the shore, are an important factor in bridging the space between international waters and dry land. The maneuver in this region requires a unique capability, a system capable of using the littorals to its advantage. The Navy and Marine Corps have operated in the littorals; however, experience with such operations does not guarantee proficiency. Recurring training is essential toward achieving proficiency. Although amphibious operations and training are a regular regimen, with the proliferation of anti-access weapon systems, these systems have made littoral operations more challenging than in the past. The standoff range and lethality posed by these systems compels the naval services to attend further to these threats to ensure littoral access. The challenges presented during operations in the littorals was the primary impetus for the Navy and Marine Corps’ development of the capstone concepts of Expeditionary Maneuver Warfare (EMW), Operational Maneuver from the Sea (OMFTS), and Ship to Objective Maneuver (STOM); specifically designed to mitigate the risks associated with the ever increasing anti-access threat. The challenges to these operations have increased and the need to ensure littoral access has grown precipitously. For the US to be successful, across the spectrum of military operations, the capability to project power from the sea must exist. From the rapid buildup of sustainable combat power to precise penetrations for mechanized raids, a viable materiel solution to take advantage of the littorals is essential for the Navy and Marine Corps, and joint force.

United States leadership and national power can serve a source of stability in uncertain times as states throughout the world rely on US presence and maritime power to provide security. Within the past twelve years, the positioning of naval forces off the shores of potential

flash point has provided a calming effect. In 1999 to 2000, Serbia's President Milosevic began posturing for an assault on Montenegro in attempt to neutralize his primary threat Milo Djukanovic, President of Montenegro. Through international pressure and US diplomatic and military posturing, the potential invasion did not occur.¹⁰ The demonstration of national resolve backed by a credible capability is a component of military and diplomatic power. This action demonstrates US resolve to honor mutually agreed upon security commitments with its international partners.

Freedom of movement throughout the littorals, undergirded by US security guarantees, promotes economic growth in states that might lack the diplomatic, military, or economic means to safeguard their commerce. Although Defense cost-cutting measures may contribute toward alleviating a portion of the US national debt, the risk of unintended consequences that might work against other US national interests are factors in the security calculus requiring constant examination by security professionals. For example, curtailing US maritime capability might bolster the ambition of adversaries to seek control of these maritime choke points. Furthermore, lessening US maritime capability may create the perception of a weaker US by other states thus inviting the latter to behave more aggressively. A prime example is the Straits of Malacca, "[A]bout 40% of the world's trade passes through the strait on 50,000 vessels...every year."¹¹ With the proliferation and relative accessibility of sophisticated anti-ship missiles, determined belligerents can cause instability disproportionate to their relative size and thus require the United States to possess a system capable of deterring potential belligerents and reducing the likelihood of this occurring.

LITTORAL ACCESS

“There is little that will sober an enemy more surely than the knowledge that somewhere, just over the horizon, lies a force of well-trained, well-equipped Marines in competently manned ships capable of delivering a stunning amphibious blow at a point and time of their own choosing.”¹² - Krulak

Transiting the seam between sea and land operations today remains a hallmark of Marine operations since the early 20th century. Much of the technological functionality of equipment employed by units conducting amphibious operations has remained relatively unchanged – information exchange still relies on the electromagnetic spectrum; targets are serviced using conventional munitions; and the principles of maneuver, objective, speed, surprise, security, and unity of command are expressed in operations orders. Though the principles of maneuver remain relevant, the means that apply these maneuver principles are antiquated—namely, the primary surface assault vehicle employed during amphibious operations and its associated technology. Technology exists that could mitigate the deficiencies found in the current array of antiquated amphibious equipment. However, the US is missing an opportunity to leverage the technological advances that have greatly benefitted the development and procurement of systems throughout the Department of Defense. By failing to capitalize on the increased lethality, joint interoperability, reliability, and sustainability that technology can provide during amphibious operations, assuring access becomes more problematic when the capabilities of amphibious forces are outpaced by emerging anti access/area denial systems.

The lethality of amphibious operations through a self-deploying amphibious vehicle is critical to assuring littoral access. For the United States to apply hard and soft power requires

access to the littorals. This application of power spans the entire range of military operations -- from humanitarian and disaster relief operations on one end to small wars and regular warfare operations on the other. "The Marine Corps is trained, equipped, and organized to operate at and from the sea as part of the naval team to..."¹³ forward engage, respond to disruptions in global stability, and project national power through naval capabilities. "Sea power provides a means to deliver fires, personnel (to include amphibious forces), and resources with somewhat less immediacy than air power, but in much greater weight and volume."¹⁴ "While air power can project a light force quickly, it is soon outpaced by, and cannot compete with sea power in the projection and sustainment of larger forces."¹⁵ To build combat power ashore and facilitate the sustainment of larger naval and joint forces ashore, an amphibious vehicle capable of maneuver through the littorals and securing a lodgment is critical.

Pursuing the development and fielding of a high water speed amphibious vehicle to counter emerging threats is a Marine Corps requirement dating back to the early 1970s. In 1973, the Marine Corps established a program called the Landing Vehicle Assault. The requirements to deploy from amphibious ships located 15 to 20 miles offshore, move at speeds of 25 to 40 knots, and develop an improved weapons system¹⁶ have yet to be met. The program was cancelled due to budgetary issues at the request of then-Commandant of the Marine Corps General Louis H. Wilson. Instead, the Landing Craft Air Cushion (LCAC) would be the future for amphibious operations.

Some argue that the Marine Corps' perceived necessity for a robust amphibious capability is wedded to nostalgia. However, the Marine Corps has conducted over 107 successful amphibious type operations since 1990.¹⁷ In 1991, during Operation Desert Storm, the Marine Corps conducted an amphibious rehearsal on the shores of Qatar. The rehearsal

demonstrated to Saddam Hussein that the US possessed the capability and the forces necessary to conduct an amphibious operation of this size and was fully committed to its execution. The intent was to create deception, to tie up Iraqi forces along the coast of Kuwait anticipating an amphibious assault.¹⁸ The credibility of its possible employment successfully forced the dispersion of Iraqi land forces and prevented the reinforcement along the Kuwait-Saudi defenses.

The possibility still exists that circumstances would require a forcible entry amphibious operation. History has shown the utility and necessity of conducting such operations. “The recent operational experience attests to the effectiveness of amphibious tracked vehicles in providing the capability and capacity demanded by numerous operating environments – permissive, uncertain or hostile.”¹⁹ The Marine Corps has realized that this is a core competency, one to be maintained in order to fulfill Navy and Marine Corps operating concepts and build the correct capabilities set for emerging threats.

OPERATING CONCEPTS AND COMPETENCIES

The Marine Corps has vested much time and energy into framing the anticipated security environment and identifying those needed capabilities. Fostering the right philosophy within the organization is critical so that the complexities envisioned for current and future conflicts are instilled in future generations. In developing these skills the Marine Corps is exposing future leaders to the complexities and allowing them the latitude to explore possible solutions.

In June 2007, the Strategic Vision Group (SVG) was established to aid the Commandant of the Marine Corps to posture the service for the future. The SVG assesses the emerging security threats facing the United States, determines their implications to national security, and proposes steps to ensure the Marine Corps’ continued readiness. The Marine Corps’ core

competencies, identified in *Marine Corps Vision and Strategy 2025*, in support of national defense:

- Conduct persistent forward naval engagement and is always prepared to respond as the Nation's force in readiness
- Employ integrated combine arms across the range of military operations and operate as part of a joint or multinational force
- Provide forces and specialized detachments for service aboard naval ships, on stations, and for operations ashore
- Conduct joint forcible entry operations from the sea and develop amphibious landing force capabilities and doctrine
- Conduct complex expeditionary operations in urban littorals and other challenging environments
- Lead joint and multinational operations and enable interagency activities²⁰

All of these core competencies expressed in the *Marine Corps Operating Concepts, third version of 2010* and complimented in the concepts of Expeditionary Maneuver Warfare (EMW), Operational Maneuver from the Sea (OMFTS), and Ship to Objective Maneuver (STOM) form a shared vision by which the institution drives training, education, equipment requirements, and doctrine. This overarching philosophy provides perspective. It frames the vision of the future and the means by which to meet the challenges presented.

The concept of Enhanced Marine-Air-Ground-Task-Force Operations (EMO) as defined by the *Marine Corps Operating Concepts* and the Marine Corps Strategic Vision Group agree on several fundamentals for EMO execution and is the Marine Corps plan to mitigate the challenges of an uncertain security environment:

- Operate in a distributed environment where information and communication may be limited or nonexistent and thus require informed decision-makers at the lowest echelons of command
- Perform multiple, diverse, and often simultaneous tasks across the range of military operations
- Employ, support, and sustain subordinates maneuver units at extended distances, or in compartmentalized terrain, which creates physical separation from higher and adjacent units
- Interact effectively with local populations to understand a given situation and ensure tactical actions support strategic goals
- Conduct operations at sea, from the sea, and ashore
- Overcome challenges to access and mobility, and when necessary employ decentralized operations to assure access through multiple entry points
- Selectively mass or disperse forces and fires at desired times and places, as the situation requires²¹

CONCEPT REQUIREMENTS

In the future security environment, the US needs a vehicle for amphibious operations. “The AAV7A1 has limited capabilities, is becoming less survivable on the modern battlefield and does not meet the operational requirements of future warfighting concepts.”²² In terms of what the Marine Corps needs, this vehicle “[M]ust embody full amphibious qualities and land fighting capabilities that will permit its utilization in all ground combat operations against the projected threat day and night.”²³ It must possess the requisite warfighting capabilities to effectively support landing forces, provide accurate navigation information, joint forces communication interoperability, sufficient land and sea mobility, offensive firepower, armor protection, carry capacity, and reliability to operate successfully in transporting the surface assault elements of the landing force in a single lift from assault shipping to inland objective(s).²⁴

In short, the replacement for the Amphibious Assault Vehicle must shoot, move, communicate, carry and protect Marines across the range of military operations.

In the EMO concept, the principle of dispersed units throughout the battlefield to offset the enemy mass fires capabilities requires assets within the unit capable of mobility and speed in order to rapidly aggregate to take advantage of mass, when necessary or when opportunities present themselves.²⁵ To further this point, Lieutenant General Flynn states, “We must be able to operate from dispersed to concentrated throughout the battlefield regardless of terrain, distance, and complexity, in operations that span the [Range of Military Operations].”²⁶ A vehicle designed for that intended purpose best accomplishes the ability to aggregate rapidly disparate forces. The concept of decentralized action in a dispersed environment requires the unit to possess several capabilities: robust communication, mobility, speed, and precision direct fire weapons. The tracked armored personnel carrier is such a vehicle to provide these capabilities.

Decentralized action requires small units down to squad size unit to possess robust communication assets in order to reach back to higher headquarters to draw resources, intelligence, fire support, and logistics support during operations even though their execution is decentralized. Squad-sized units require several other vehicles or handheld communication devices to operate effectively in a decentralized environment for the current suite is insufficient and incapable of meeting the burgeoning information requirements generated among the organizational echelons of military command. Although the proliferation of advanced communication equipment may lead toward greater battlespace awareness and effective mission accomplishment, these systems increase the electrical power requirements of the unit and laden organizations with additional logistical challenges inherent with operating multiple vehicles. Each Expeditionary Fighting Vehicle provided the equivalent communications capability of a

company operations center communication suite, making the vehicle the Marine Corps' most Command, Control, Communication, Computers and Intelligence (C4I) capable ground combat vehicle.

The advantage that a tracked vehicle provides in comparison to wheeled vehicles is the ability to negotiate more types of difficult-to-traverse terrain. Ground wheeled vehicles are relegated predominately to the existing road networks. This makes movement predictable and increases the exposure to and likelihood of ambush, to include the use of improvised explosive device attacks. The tracked vehicle affords more flexibility to alter unit routes and maximize maneuver space. Even in the restrictive urban terrain, the tracked vehicle affords mobility at critical times when wheeled vehicles are ineffective. During Operation Continue Hope in Somalia in October 1994, U.S. Army Rangers and Special Forces units isolated in Mogadishu's urban terrain needed tracked vehicles for extraction. Wheeled assets lacked the armor protection but most importantly were unable to negotiate the obstacles that the Somalis had placed along the roads. The Pakistani and Malaysian forces along with soldiers from the US 10th Mountain Division departed the following morning to withdraw the trapped units using M60 tanks and Armored Personnel Carriers to provide the majority of the ground lift and direct fire support.²⁷ The use of armored vehicles inside restrictive terrain has its utility.

Precision direct fire assets employed at the lowest small unit level possible is a significant combat multiplier. A fully stabilized turret provides precision long-range fires able to destroy a large variety of target sets at distances greater than those organic weapons systems found at platoon and smaller sized units. They are more responsive than indirect and air support assets, and when coupled with a thermal imaging and targeting system, the additional firepower afforded to small units is substantially superior to the AAV. The capability that this provides the

small unit leader is significant. It enables unit leaders to get first round effects on target as quickly as possible, thereby increasing the leader's response time to address adversaries. Additionally, the precise nature of these precision systems enables Marines to engage hostile forces and minimize collateral damage. No other organic weapon system can provide this type of accuracy, lethality and immediacy down to the infantry squad level. The tank or the Light Armored Vehicle (LAV) provides this immediacy; however, these vehicles habitually do not provide support to units smaller than an infantry platoon.

There currently are systems within the Marine Corps that can accomplish some of these capabilities but not in their entirety. The AAV is capable of amphibious operations within 5 thousand yards (2.84 miles) to the landing site and at current speeds of 8.2 miles per hour (7.12 knots).²⁸ Once ashore the AAV provides an infantry squad the cross-country tactical mobility equal to the M1A1 tank. However, in the area of communication and precision fire the AAV is currently unable to meet fully the needs for truly decentralized small unit operations. The Light Armored Vehicle (LAV) provides precision fire; however, it lacks the cross-country tactical mobility of a tracked vehicle. The LAV's communication capability is comparable to the AAV but is inadequate in the quantity of infantry personnel it can transport. As for amphibious capability, the LAV can ford water obstacles but is unable to self deploy from amphibious shipping and requires naval surface lift support to negotiate the littorals. Furthermore, the LAV is not capable of operating in the open ocean and surf zone.²⁹ The M1A1 tank provides superior precision fire and cross-country mobility but no increased communication capability and most importantly provides no infantry transport. The Mine Resistant Ambush Protected (MRAP) vehicle provides excellent survivability; however, it provides no additional capability in cross-country mobility, communication, or precision firepower. The only platform in the US inventory

that provides a substantial increase along the majority of these capabilities is the Bradley Infantry Fighting Vehicle. The only significant disadvantages to the Bradley are the reduced number of infantry personnel each vehicle can carry (6 in the M2A1 and 7 in the M2A2/M2A3 Bradley³⁰ compared to 18 in the AAV) and its lack of amphibious capability.

The Land Craft Air Cushioned (LCAC) is a high water speed platform that can provide surface lift for amphibious operations from distance in excess of 25 nautical miles. It has the capability to lift nearly two squads of infantry, a single M1A1 tank, four LAVs or three AAVs.³¹ While the LCAC transits to shore at speeds in excess of 30 knots, their limited number will not satisfy Marine Corps lift requirements. For a Marine Expeditionary Unit (MEU) to conduct an amphibious operation requiring the use of armor assets within the Battalion Landing Team (BLT) to include a reinforced infantry company will require 14 LCACs. This exceeds the Amphibious Ready Group's (ARG) carrying capacity due to available cube space across the three amphibious ships.

The high speed, self-deploying tracked vehicle outperformed and was the least costly in comparison to the other options evaluated during the Analysis of Alternatives (AoA)³² conducted by the Center for Naval Analysis. During the 2000 study, the thirteen alternatives were evaluated to determine their ability to meet the Joint Requirements Oversight Council's established capabilities for Marine Corps' surface assault requirements, specifically to conduct a surface assault from amphibious shipping located over-the-horizon. The evaluation criteria of alternative platforms was based on the time required to move surface assault elements of the Marine Expeditionary Force (MEF) to shore, build up rate of combat power ashore, impact of alternatives on amphibious ship mixes, lethality, and survivability. The possible solutions evaluated ran the gamut -- namely a self-deploying tracked vehicle (fast and slow water speeds),

a submersible vehicle, Bradley and LAVs loaded on connector vessels, and non-vehicle solutions (i.e. all air, all LCAC) as well as a mixed option of all the alternatives (refer to Table 1 for details).

Alternatives demonstrated advantages and disadvantages; in each of the evaluation areas, however, the superior alternative in overall operational effectiveness was the high speed, self-deploying tracked vehicle. One key characteristic of the evaluation involved the time it took to deliver a MEF size element from over-the-horizon to the shore, to include the additional LCAC sorties needed to provide the remainder of the surface lift. The high speed, self-deploying alternative was able to deliver 87% of the MEF's combat power ashore in less than 45 minutes after H-Hour with the smallest amount of remaining LCAC sorties (47)³³ to deliver the remainder of the MEF (refer to Table 2 for details). The slow speed and non-amphibious alternatives would require a significant amount of additional time based on their need to employ the LCAC as their primary ship-to-shore connector. This additional lift requirement would place anywhere from 97 to 388 LCAC sorties,³⁴ dependent of the selected platform, as well as between 1.25 to 6.5 additional hours post H-Hour to achieve the same 87% MEF combat power ashore as the high speed, self-deploying alternative.

For example, two of the alternatives considered were the M2A2 Bradley Infantry Fighting Vehicle and the Light Armored Vehicle (LAV-25) would require 296 and 148 LCAC sorties respectively. The LCAC, one of the non-vehicle alternatives evaluated, was considered as a possible solution; however, it was quickly ruled out for three primary reasons: the significant cost associated with additional LCAC purchases, the additional purchase of amphibious ships necessary to transport the LCAC and meet MEF size surface assault requirements, and finally the LCAC's lack of armor-protected mobility.³⁵ The self-deploying, tracked vehicle capable of high

water speed was determined to be the best performer and most effective based on its ability to build rapidly combat power ashore and the lethality of the 30mm cannon.³⁶ In the Measures of Effectiveness (MOEs) across all light levels, threat conditions, and tactical situations this solution outperformed all others.

The capabilities necessary to fulfill the strategic vision shared by the Navy and Marine Corps and make EMW a reality are within reach. The ability to afford commanders at the national strategic level a balanced mix of capabilities, applied at the right time and place, is critical to addressing the future security environment. Currently a reevaluation of the third capability that would provide the operational reach to conduct over the horizon operations is underway. The requirement to conduct a surface assault from 25 nautical miles is likely to shorten to between 12 nautical miles but less than 25 as General Dunford, Assistant Commandant of the Marine Corps, and Admiral Greenert, Vice Chief of Naval Operations, testified to Congress.³⁷ With this proposed requirements change, the current AAV is still unable to meet this objective. A new system or significant modifications are needed to meet this goal.

The need for a high speed, self-deploying tracked vehicle is critical not only to speed the transition from ship to shore, but more importantly in providing options for the commander. The opportunity to shift to alternate penetration points based on the enemy's disposition and threat is essential in allowing maximum flexibility to the maneuvering unit. Avoiding the enemy's strength is even more critical during the vulnerable transition through the littorals. The capability to execute a branch plan after departure from amphibious ships requires a high-speed vehicle. The AAV does not afford the commander this option.

As discussed earlier, the concept of Over-the-Horizon operations has driven the Navy and Marine Corps operating concepts for nearly four decades. Events in 2006 have confirmed the

reality of the increased anti-access threat. The proliferation of relatively inexpensive anti-access weaponry makes the denial of littoral access that much more prevalent. The concept of standoff, collecting and staging beyond the horizon, reduces the risk to amphibious forces as they form up. This threat has not diminished as recent events off the coast of Lebanon in July 2006 demonstrated. Hezbollah successfully fired on an Israeli frigate with relative impunity and significant standoff distance.³⁸ The sophistication of these anti-access systems have made the littorals more difficult to access but not impossible. The necessity of developing a more capable system to conduct amphibious operations in an environment of increased anti-access threat is necessary to offset the threat these weapons present. With the Navy and Marine Corps' concurrence on shortening the standoff distance of amphibious ships the US is accepting risk in conducting amphibious operations of the future. Not addressing this threat places both lives and the mission at risk.

ARMORED VEHICLES IN IRREGULAR WARFARE

During Operations Iraqi Freedom and Enduring Freedom, the doctrinal shift has predominantly focused on population centric operations. Some practitioners have negated the relevance of mechanized armored vehicles and their applicability in the irregular fight. They contend that mechanized assets send the wrong message when attempting to win the "hearts and minds" of the population.³⁹ The apprehension to employ armored vehicles in Afghanistan has driven the Marine Corps to use a platform that does not provide the mobility, firepower, or C4I capability that a mechanized vehicle does. In essence, the Marine Corps deployed without its primary means of getting to the fight and thus failed to employ all of its mechanized resources, specifically the AAV. Some of the apprehension for employing a mechanized vehicle in the

irregular environment of Afghanistan is a matter of perception. A perception that “hearts and minds” cannot be won with a vehicle that portrays an image characterized by conventional operations. This characterization has led some to believe that mechanized vehicles have no place in the irregular fight and that their introduction into this environment reinforces a perception of a heavy handiness, non-population friendly approach. This perception has driven the Marine Corps to employ alternative vehicles. The failure to see the utility this armored vehicle provides is failing to exploit fully the potential of the Ground Combat Element and therefore the MAGTF as a whole. Current operations in the irregular fight have demonstrated the utility of mechanized vehicles in the counter insurgency fight.

David E. Johnson and John Gordon IV contacted representatives from the U.S. Marine Corps, British, Canadian, Israeli, and Danish armies to gain their perspectives on strengths and weaknesses of heavy forces in irregular and hybrid conflicts. The overall observations concluded, “Tanks and IFVs [Infantry Fighting Vehicles] have proven very useful in Irregular Warfare, including COIN [Counter Insurgency] environments in Afghanistan and Iraq.”⁴⁰ The higher level of survivability, lethality that long range, precision fire provides, and the capability for off road mobility in comparison to wheeled assets was invaluable. During the 2006 Israel and Lebanon conflict, Israeli heavy armor played little to no role largely due to the perceived irrelevance in Low Intensity Conflict. Following this the Israeli Defense Force went “back to basics” and reoriented their training to incorporate heavy armor during the irregular fight. In 2008, during operations in Gaza the Israeli army employed tanks and IFVs to great success, demonstrating their relevance and necessity when facing irregular challenges.⁴¹

In 2008, following an upsurge in Taliban activity in southern Afghanistan, Canadian commanders requested the deployment of Leopard I tanks, which quickly became key players in

supporting Canadian, Afghan, and British forces. Again in 2009, Danish forces requested armor into Afghanistan. Following the above examples, the U.S. Marine Corps deployed a company of M1A1 tanks in 2010 to support operations in Helmand province. In a statement to the *Washington Post*, David Johnson, senior researcher for the Rand Corporation opined, “Tanks give you immediate, protected firepower and mobility to address a threat that’s beyond the range”⁴² of machine guns mounted on the mine resistant trucks. The overarching theme is that heavy armor provides intimidation, diminished insurgent activity when mechanized vehicles are present, they provide protected mobility, and additional precision fires that provide rapid response with minimal collateral damage compared to the timeliness and accuracy of artillery and air support.⁴³

In November 2010, the operational decision by the Marine Corps to employ heavy mechanized assets, specifically the M1A1 tank, into Afghanistan⁴⁴ reflects the concurrence that armored, tracked vehicles do have a relevant role in the counter insurgency operations. However, the deployment of the AAV to Afghanistan is yet to take place. The Marine Corps is not the first to recognize the utility in providing commanders the capability of precision firepower, cross-country mobility, and increased survivability. Several participating International Security Assistance Force countries have led the way in this realization. Canada, Denmark, and Britain have seen the effectiveness of the armored vehicle capability in the Afghanistan theater and continue to employ them.⁴⁵ The secondary effects, presence, intimidation, and shock, of armor in the counterinsurgency fight, though limited in comparison to the conventional fight are advantageous. Presence in and of itself can provide a stabilizing effect as hostile events continue to escalate. Mechanized vehicles inherently possess a greater intimidation and shock factor than those normally found in wheeled vehicles. This psychological

effect forces hostile actions at greater distances, as enemy forces realize the futility behind sustained close-in engagements against US mechanized forces. Thus, greater separation between belligerent forces and dismounted units provides for greater security of US forces and those populations US forces seek to protect.

CONCLUSION

The US has an interest in global stability and continues to pursue partnerships that are advantageous to this stability. This contribution provides the United States the ability on many occasions to influence and shape events as they transpire throughout the world. To be a capable maritime nation, the US must remain postured and equipped to ensure global trade remains active and free. Assuring access to the littorals of the world, where likely crises will arise, remains a US vital interest. The most viable way to accomplish US strategic aims of assuring access to the global littorals is to retain the ability to project national power at a time and place of the United States' choosing.

It is critical that the US possess a viable and capable option to prevent conflict, protect national interests, and prevail in conflicts across the range of military operations in an uncertain future security environment. The Marine Corps must be capable of using the littorals to its advantage and possess as part of a naval force the ability to rapidly transition to sustained land operations. The utility of such an amphibious vehicle, capable of executing multifaceted missions, must operate equally well as an armored personnel carrier as it does as an amphibious vehicle able to negotiate the littorals. A vehicle versatile in application across the range of military operations rests at the Marine Corps' mission center. Therefore, it is essential to retain the Marine Corps' fundamental essence for being; to be ready when the nation is least ready, an

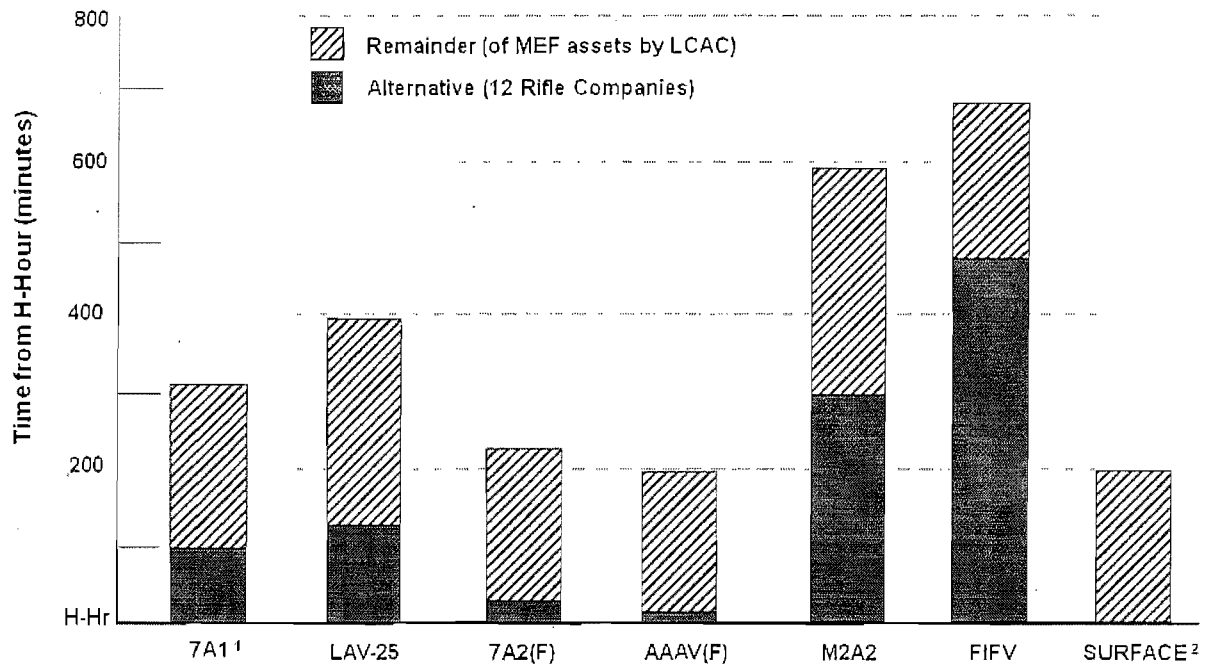
expeditionary force retaining its naval heritage, and capable of fulfilling its obligation to the defense of the nation and its national interests. The capability required to assure access in the littorals is essential to conduct future operations in an uncertain security environment. The procurement of such a multi-mission capable vehicle is not a guarantee for success; however, failure to address the strategic gap created is certainly a recipe for disaster.

Alternatives Evaluated

Key Characteristics of 13 Alternatives								
	Troops	Weight	Main Arm.	Qty / MEF	Qty / 12 Inf Cos	Qty / LCAC	LCAC Loads / MEF	Additional Crewmen
Slow Speed Amphibians								
AAV7A1	18	27.4	50/40mm	204	144	2	102	0
AAV7A2(S)	18	28.2	30mm	204	144	2	102	0
AAAV(S)	18	26.7	30mm	204	144	2	102	0
Submers.	Ruled out							
High Speed Amphibians								
AAV7A2(F)	9	32.3	30mm	388	288	NA	0	552
AAAV(F)	18	31.3	30mm	204	144	NA	0	0
Non-amphibious Vehicles								
APC(X)	18	25.7	30mm	204	144	2	102	0
LAV-25	6	14.5	25mm	592	432	4	148	1,164
M113A3	9	14.5	50cal	388	288	4	97	164
M2A2	6	32.8	25mm	592	432	2	296	1,164
FIFV	9	64.7	45mm	388	288	1	388	164
Non-vehicle Alternatives								
Surface	6 MCESS Shelters / LCAC for 216 Troops / LCAC						12 (12 Inf Cos)	NA
Air	95 Additional CH-60s to support MEF						NA	384

Table 1: Alternatives Evaluated during Advanced Amphibious Assault (AAA) Program Cost and Operational Effectiveness Analysis (COEA) Ship-to-Shore Analysis

Ship-to-Shore Movement Time



1 - Same times for 7A2(S), AAV(S), APC(X), and M113A3.

2 - Troops arrive at beach with no armor protected mobility, same for Air case.

Table 2: Ship-to-Shore Movement Time analysis conducted during Advanced Amphibious Assault (AAA) Program Cost and Operational Effectiveness Analysis (COEA) Ship-to-Shore Analysis

ENDNOTES

¹ Joseph S. Nye Jr., "East Asian Security: The Case for Deep Engagement," *Foreign Affairs*, (July/August 1995), <http://www.foreignaffairs.com/articles/51210/joseph-s-nye-jr/east-asian-security-the-case-for-deep-engagement>. (accessed January 5, 2011).

² U.S. Joint Forces Command, *The JOE: Joint Operating Environment*, (Suffolk, VA: U.S. Joint Forces Command, February 2010), 4.

³ Robert M. Gates, "Statement on Department Budget and Efficiencies" (Speech, The Pentagon, Washington D.C., January 6, 2011).

⁴ Robert M. Gates, "Statement on Department Budget and Efficiencies" (Speech, The Pentagon, Washington D.C., January 6, 2011).

⁵ Commandant of the Marine Corps, "Chief of Naval Operations, Adm. Gary Roughead delivers remarks at House Armed Services Committee Holds Hearing on the Proposed Fiscal 2012 Budget for the U.S. Navy" (Testimony, U.S. Capital, Washington D.C., March 1, 2011). <http://www.navy.mil/navydata/people/cno/Roughead/Other/110301%20HASC%20Transcript.pdf>. (accessed March 14, 2011).

⁶ Commandant of the Marine Corps, 35th Commandant's Planning Guidance, October 27, 2010, 3, <http://www.usmc.mil/unit/hqmc/cmc/Documents/CMC%2035%20Planning%20Guidance%20FINAL.pdf>. (accessed October 27, 2010).

⁷ "World Urbanization Prospects The 2003 Revision", March 24, 2004, United Nations, Department of Economics and Social Affairs, Population Division, Data Tables and Highlights, ESA/P/WP.190, New York, NY, 1-2.

⁸ President of the United States, *National Security Strategy* (Washington DC: President of the United States, 2010), 50, http://www.whitehouse.gov/sites/default/files/rss_viewer/national_security_strategy.pdf. (accessed January 13, 2011).

⁹ George J. Flynn, "Amphibious Capability Vital, Cancellation of EFV Leaves Strategic Gap." *Defense News*, (January 10, 2011). <http://ebird.osd.mil/ebfiles/e20110110799367.html>. (accessed January 11, 2011).

¹⁰ Gregory L. Schulte. "Deterring Attack The Role of Information Operations." *Joint Forces Quarterly*. (Winter 2002-2003), http://findarticles.com/p/articles/mi_m0KNN/is_33/ai_n6082829/?tag=content;coll. (accessed February 14, 2011).

- ¹¹ Michael Schuman, "How to Defeat Pirates: Success in the Strait," *Time.com*, http://www.time.com/time/world/article/0,8599,1893032,00.html?iid=perma_share. (accessed February 24, 2011).
- ¹² Victor H. Krulak, *First to Fight: An Inside View of the U.S. Marine Corps*. (Annapolis, MD: The Naval Institute Press, 1984), 226.
- ¹³ Deputy Commandant for Combat Development and Integration, Marine Corps Operating Concepts, Third Edition, June 2010, 6.
- ¹⁴ Deputy Commandant for Combat Development and Integration, Marine Corps Operating Concepts, Third Edition, June 2010, 90.
- ¹⁵ Deputy Commandant for Combat Development and Integration, Marine Corps Operating Concepts, Third Edition, June 2010, 90.
- ¹⁶ U.S. Department of the Navy. *Landing Vehicle Assault (LVA) Program*, Memorandum for the Under Secretary of Defense for Research and Engineering by General Louis H. Wilson, Commandant of the Marine Corps, Washington DC: Department of the Navy, January 29, 1979.
- ¹⁷ Deputy Commandant for Combat Development and Integration, Marine Corps Operating Concepts, Third Edition, June 2010, 92.
- ¹⁸ Marvin Pokrant, *Desert Storm at sea: What the Navy really did*. (Westport, CT: Greenwood Press, 1999), 95.
- ¹⁹ George J. Flynn, "Amphibious Capability Vital, Cancellation of EFV Leaves Strategic Gap." *Defense News*, (January 10, 2011). <http://ebird.osd.mil/ebfiles/e20110110799367.html>. (accessed January 11, 2011).
- ²⁰ Headquarters U.S. Marine Corps, *Marine Corps Vision and Strategy 2025, Executive Summary* (Washington, DC: U.S. Marine Corps, 2008), 7-9.
- ²¹ Deputy Commandant for Combat Development and Integration, Marine Corps Operating Concepts, Third Edition, June 2010, 30.
- ²² U.S. Department of Defense, *Capabilities and Production Document for Expeditionary Fighting Vehicle*, April 13, 2006, ii.
- ²³ U.S. Department of Defense, *Capabilities and Production Document for Expeditionary Fighting Vehicle*, April 13, 2006, 22.
- ²⁴ U.S. Department of Defense, *Capabilities and Production Document for Expeditionary Fighting Vehicle*, April 13, 2006, 22.

²⁵ Deputy Commandant for Combat Development and Integration, Marine Corps Operating Concepts, Third Edition, June 2010, 33.

²⁶ Deputy Commandant for Combat Development and Integration, Marine Corps Operating Concepts, Third Edition, June 2010, 3.

²⁷ U.S. Army Center of Military History and Richard W. Stewart, *The United States Army in Somalia 1992-1994*, CMH Pub 70-81-1, (Washington, DC: U.S. Army Center of Military History, 2002), 22.

²⁸ Headquarters U.S. Marine Corps, *Employment of Amphibious Assault Vehicles (AAVs)*, MCWP 3-13 w/chg 1 (Washington, DC: U.S. Marine Corps, February 17, 2005), 1-1.

²⁹ Headquarters U.S. Marine Corps, *Employment of the Light Armored Reconnaissance Battalion*, MCWP 3-14 (Washington, DC: U.S. Marine Corps, September 17, 2009), 2-6.

³⁰ Headquarters Department of the Army, *The Infantry Rifle Platoon and Squad*. FM 23-21.8, (Washington, DC: U.S. Army, March 28, 2007), D-14 - D-15.

³¹ Norman Polmar, *The Naval Institute Guide to the Ships and Aircraft of the U.S. Fleet*. (Annapolis, MD: The Naval Institute Press, 2005), 202.

³² George Akst, "AAAV Analysis of Alternative (AoA)" (briefing, Marine Corps Combat Development Command, Quantico, VA, November 15, 2000).

³³ George Akst and David Brenner, "Advanced Amphibious Assault (AAA) Program Cost and Operational Effectiveness Analysis", Center for Naval Analyses, 1990, updated 1993, 1994.

³⁴ George Akst and David Brenner, "Advanced Amphibious Assault (AAA) Program Cost and Operational Effectiveness Analysis", Center for Naval Analyses, 1990, updated 1993, 1994.

³⁵ George Akst and David Brenner, "Advanced Amphibious Assault (AAA) Program Cost and Operational Effectiveness Analysis", Center for Naval Analyses, 1990, updated 1993, 1994.

³⁶ George Akst, "AAAV Analysis of Alternative (AoA)" (briefing, Marine Corps Combat Development Command, Quantico, VA, November 15, 2000).

³⁷ Joseph F. Dunford and Jonathan W. Greenert, "Marine Corps amphibious assault mission," Testimony before the U.S. Congress, January 27, 2011, <http://www.youtube.com/watch?v=rIrE43PaKMw&feature=channel>. (accessed February 13, 2011).

³⁸ The Associated Press, "Israel: Iran aided Hezbollah ship attack," USA Today, July 15, 2006, http://www.usatoday.com/news/world/2006-07-15-iran-ship-attack_x.htm. (accessed March 1, 2011).

³⁹ Wesley Morgan, "Tanks to Afghanistan – Analysis," NYTimes.com, November 23, 2010, <http://atwar.blogs.nytimes.com/2010/11/23/tanks-to-afghanistan-analysis/>. (accessed March 7, 2011).

⁴⁰ David E. Johnson and John Gordon IV, "Observations on Recent Trends in Armored Forces," RAND Arroyo Center, 2010, http://www.rand.org/pubs/occasional_papers/2010/RAND_OP287.pdf, 6.

⁴¹ David E. Johnson and John Gordon IV, "Observations on Recent Trends in Armored Forces," RAND Arroyo Center, 2010, http://www.rand.org/pubs/occasional_papers/2010/RAND_OP287.pdf, 5.

⁴² Rajiv Chandrasekaran, "U.S. sending tanks to hit harder at Taliban," *WashingtonPost.com*, November 19, 2010, <http://www.washingtonpost.com/wp-dyn/content/article/2010/11/18/AR2010111806393.html>. (accessed January 12, 2011).

⁴³ David E. Johnson and John Gordon IV, "Observations on Recent Trends in Armored Forces," RAND Arroyo Center, 2010, http://www.rand.org/pubs/occasional_papers/2010/RAND_OP287.pdf, 6.

⁴⁴ Rajiv Chandrasekaran, "U.S. sending tanks to hit harder at Taliban," *WashingtonPost.com*, November 19, 2010, <http://www.washingtonpost.com/wp-dyn/content/article/2010/11/18/AR2010111806393.html>. (accessed January 12, 2011).

⁴⁵ David E. Johnson and John Gordon IV, "Observations on Recent Trends in Armored Forces," RAND Arroyo Center, 2010, http://www.rand.org/pubs/occasional_papers/2010/RAND_OP287.pdf, 1.

BIBLIOGRAPHY

Adair, Jason T. "Learning on the run: Company level counter-insurgency in Afghanistan." *Canadian Army Journal* (Winter 2008): 26-35.

Akst, George. "AAAV Analysis of Alternative (AoA)." Briefing, Marine Corps Combat Development Command, Quantico, VA, November 15, 2000.

Akst, George and David Brenner, "Advanced Amphibious Assault Program Cost and Operational Effectiveness Analysis", Center for Naval Analyses, 1990, updated 1993, 1994.

Caldwell, Robert. "Balanced Groupings and the Dominance of Ground in remote Afghanistan Areas." *Canadian Army Journal* (Fall 2007): 111-113.

Berg, Joseph and Robert Bateman. "Life After Operational Maneuver (a 12-Step Program)." *Armor* (March-April 1999).
<https://www.knox.army.mil/center/armormag/backissues/1990s/1999/ma99/2bate99.pdf>.
(accessed January 15, 2011).

Boot, Max. "The Corps should look to its small wars past." *Armedforcesjournal.com* (March 2006). <http://www.armedforcesjournal.com/2006/03/1813950/>. (accessed January 12, 2011).

———. "The Struggle to Transform the Military." *Foreign Affairs* (March/April 2005): 103-18.

Clidas, Michael J. "Peace Operations: Is There a Need for Wheeled Armored Vehicles?" Master's thesis, School of Advanced Military Studies, US Army Command and General Staff College, 1996. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA324376&Location=U2&doc=GetTRDoc.pdf>.

Commandant of the Marine Corps. 35th *Commandant of the Marine Corps Commandant's Planning Guidance 2010*. October 26, 2010.
<http://www.usmc.mil/unit/hqmc/cmc/Documents/CMC%2035%20Planning%20Guidance%20FINAL.pdf>. (accessed October 27, 2010).

Deputy Commandant for Combat Development and Integration. *Marine Corps Operating Concepts, Third Edition*, June 2010.

Dunford, Joseph F. and Grennert, Jonathan W. "Marine Corps amphibious assault mission," *Testimony before the U.S. Congress*, January 27, 2011,
<http://www.youtube.com/watch?v=rIrE43PaKMw&feature=channel>. (accessed February 13, 2011).

Flurry, B.G. "The MRAP: A Bad Rap for the Marine Corps." Manuscript, Expeditionary Warfare School, Marine Corps University, 2008. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA509716&Location=U2&doc=GetTRDoc.pdf>.

Flynn, George, J. "Amphibious Capability Vital Cancellation of EFV Leaves Strategic Gap." *Defense News* (January 10, 2011). <http://ebird.osd.mil/ebfiles/e20110110799367.html>. (accessed January 11, 2011).

Gates, Robert M. "Statement on Department Budget and Efficiencies." Speech, The Pentagon, Washington D.C., January 6, 2011.

Gibson, Trent A. "Hell-bent on force protection: Confusing troop welfare with mission accomplishment in counterinsurgency." Master's thesis, Marine Corps Command and Staff College, Marine Corps University, 2009. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA508083&Location=U2&doc=GetTRDoc.pdf>.

Headquarters Department of the Army. *The Infantry Rifle Platoon and Squad*. FM 23-21.8. Washington, DC: Headquarters U.S. Army, March 28, 2007.

Headquarters U.S. Marine Corps. *Employment of the Amphibious Assault Vehicles (AAVs)*. MCWP 3-13 w/chg 1. Washington, DC: Headquarters U.S. Marine Corps, February 17, 2005.

Headquarters U.S. Marine Corps. *Employment of the Light Armored Reconnaissance Battalion*. MCWP 3-14. Washington, DC: Headquarters U.S. Marine Corps, September 17, 2009.

Headquarters U.S. Marine Corps. *Marine Corps Vision and Strategy 2025, Executive Summary*. Washington, DC: Headquarters U.S. Marine Corps, 2008.

Henriksen, Thomas H. "Security Lessons from The Israeli Trenches." *Policy Review* (February 2007): 17-31.

Johnson, David E. "Military capabilities for hybrid war: Insights from the Israel Defense Forces in Lebanon and Gaza." Santa Monica, CA: Rand Arroyo Center, 2010. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA518686&Location=U2&doc=GetTRDoc.pdf>. (accessed January 16, 2011).

Johnson, David E., Adam Grissom, and Olga Oliker. "In the middle of the fight: An assessment of medium-armored forces in past military operations." Santa Monica, CA: RAND Arroyo Center 2008. <http://www.rand.org/pubs/monographs/MG709.html>. (accessed February 1, 2011).

- Korb, Lawrence J., Max A. Bergmann, and Loren B. Thompson. "Marine Corps equipment after Iraq." Center for American Progress, Lexington Institute, 2006.
http://www.americanprogress.org/issues/2006/08/marine_equipment.pdf. (accessed January 7, 2011).
- Kramer, Mark. "The perils of counterinsurgency: Russia's war in Chechnya." *International Security*, (Winter 2004/2005): 5-63.
- Krulak, Victor H. *First to Fight: An Inside View of the U.S. Marine Corps*. Annapolis, MD: The Naval Institute Press, 1984.
- Lardner, Helen M. "The Army's Quest for a New Ground Combat Vehicle." Master's thesis, US Army War College, 2010. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA521772&Location=U2&doc=GetTRDoc.pdf>.
- Lyall, Jason, and Isaiah Wilson III. "Rage against the machines: Explaining outcomes in counterinsurgency wars." *International Organization*, (January 2009): 67-106.
- Magee, Robert. E. "Go Big or Go Home: Employing America's Heavy Force." Master's thesis, School of Advanced Military Studies, US Army Command and General Staff College, 2010. http://cgsc.contentdm.oclc.org/cdm4/item_viewer.php?CISOROOT=/p4013coll3&CISOPT R=2589&CISOBX=1&REC=1.
- Malkasian, Carter, Dr. "Counterinsurgency in Iraq." In *Counterinsurgency in Modern Warfare*, edited by Daniel Marston and Carter Malkasian, 241-259. New York, NY: Osprey Publishing, 2008.
- Matheny, Michael R. "Armor in low intensity conflict: What is the best tactical doctrine for armor in counterinsurgency?" *Armor* (July-August 1988).
<https://www.knox.army.mil/center/ArmorMag/backissues/1980s/1988/1988JulyAugust.pdf>. (accessed January 10, 2011).
- Nye, Joseph S. Jr. "East Asian Security: The Case for Deep Engagement." *Foreign Affairs*, (July/August 1995). <http://www.foreignaffairs.com/articles/51210/joseph-s-nye-jr/east-asian-security-the-case-for-deep-engagement>. (accessed January 5, 2011).
- Pokrant, Marvin. *Desert Storm at Sea: What the Navy Really Did*. Westport, CT: Greenwood Press, 1999.
- President of the United States. *National Security Strategy*. Washington DC: President of the United States, 2010.
http://www.whitehouse.gov/sites/default/files/rss_viewer/national_security_strategy.pdf. (accessed January 13, 2011).
- Polmar, Norman. *The Naval Institute Guide to the Ships and Aircraft of the U.S. Fleet*. Annapolis, MD, The Naval Institute Press, 2005.

- Reveron, Derek, S. *Exporting security: International engagement, security cooperation, and the changing face of the US military*. Washington, DC: Georgetown University Press, 2010.
- Richard, Benjamin J. "The LAV III in Counter-Insurgency Warfare-Tactical Lessons Learned." *Canadian Army Journal* (Spring 2007): 45-54.
- Schulte, Gregory. L. "Deterring attack: The role of information operations." *Joint Forces Quarterly* (Winter 2002-2003).
http://findarticles.com/p/articles/mi_m0KNN/is_33/ai_n6082829/?tag=content;coll.
 (accessed February 14, 2011).
- Schuman, Michael. "How to Defeat Pirates: Success in the Strait." *Time.com* (April 22, 2009).
http://www.time.com/time/world/article/0,8599,1893032,00.html?iid=perma_share.
 (accessed February 24, 2011).
- Smith, Niel. "The Armor Effect: The Surprising Utility of Armored Forces in Urban and Irregular Warfare." *Air Land Sea Bulletin*, (January 2008): 6-9.
- Smith, Niel, and Sean MacFarland. "Anbar awakens: The tipping point." *Military Review*, (March-April 2008): 41-52.
- Smithley, M. "The need to mobilize armor in Afghanistan." Master's thesis, Marine Corps University, 2009. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA517792&Location=U2&doc=GetTRDoc.pdf>.
- The Associated Press. "Israel: Iran aided Hezbollah ship attack." *USA Today*, July 15, 2006.
http://www.usatoday.com/news/world/2006-07-15-iran-ship-attack_x.htm. (accessed March 1, 2011).
- Thompson, L. B. *A vision of future amphibious warfare that will not work*. Lexington Institute [database online]. Alexandria, VA, 20102011]. Available from
<http://www.lexingtoninstitute.org/a-vision-of-future-amphibious-warfare-that-will-not-work1?a=1&c=1171>. (accessed 16 February 2011).
- United Nations. *World Urbanization Prospects -The 2003 Revision*. Department of Economics and Social Affairs, Population Division, Data Tables and Highlights, ESA/P/WP.190, New York, NY, March 24, 2004.
- U.S. Army Center of Military History, and Richard W. Stewart. *The United States Army in Somalia 1992-1994*. CMH Pub 70-81-1. Washington, DC: U.S. Army Center of Military History, 2002.
- U.S. Department of Defense, *Capabilities and Production Document for Expeditionary Fighting Vehicle*, April 13, 2006.

U.S. Department of the Navy. *Landing Vehicle Assault (LVA) Program*, Memorandum for the Under Secretary of Defense for Research and Engineering by General Louis H. Wilson, Commandant of the Marine Corps, Washington DC: Department of the Navy, 1979.

U.S. House Armed Services Committee. "Chief of Naval Operations, Adm. Gary Roughead delivers remarks at House Armed Services Committee Holds Hearing on the Proposed Fiscal 2012 Budget for the U.S. Navy" *Testimony before the U.S. House Armed Services Committee*, March 1, 2011, <http://www.navy.mil/navydata/people/cno/Roughead/Other/110301%20HASC%20Transcript.pdf>. (accessed March 14, 2011).

U.S. Joint Forces Command. *The JOE: Joint Operating Environment*. Suffolk, VA: U.S. Joint Forces Command, February 2010.

U.S. Joint Research and Test Activity, Williamson, Dan H. and Francis W. McDonald. *Armor Organization for Counterinsurgency Operations in Vietnam*. JRATI, Project No. 1B--156,0. San Francisco, CA: U.S. Joint Research and Test Activity, 1966. <http://www.dtic.mil/cgi-bin/GetTRDoc?AD=AD371338&Location=U2&doc=GetTRDoc.pdf>.

Woodward, Susan. "The Capabilities That Medium-Armored Forces Bring to the Full Spectrum of Operations." Santa Monica, CA: RAND Arroyo Center, 2009. http://www.rand.org/pubs/research_briefs/2009/RAND_RB9416.pdf. (accessed January 6, 2011).