TRADOC

Army Capabilities Integration Center (ARCIC)

Action Officer Guide for the Development of the Operational Mode Summary/Mission Profile (OMS/MP)

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Introduction

An Operational Mode Summary/Mission Profile (OMS/MP) is a time phased representation of planned operations at the tasks, conditions and standards level across the range of military operations. The regulation governing development of OMS/MPs is TRADOC Regulation 71-20, "Concept Development, Capabilities Determination, and Capabilities Integration."

There are two forms of OMS/MPs that serve to identify both formation and system level operational environments.

A formation OMS/MP provides a detailed operational understanding of expected peacetime and wartime usage and requirements expressed in a structured and quantitative format. The primary use of the formation OMS/MP is as a supporting document for organic system Capability Development Document (CDD) and Capability Production Document (CPD) development. The formation proponent develops the OMS/MP describing the expected missions, units or mix of units, peacetime and wartime uses, geographical environments, and support and maintenance plan as identified in the formation's respective doctrine and concepts. Formation OMS/MPs support the materiel developer, tester, and the U.S. Army Materiel Systems Analysis Activity (AMSAA's) efforts to field systems that are effectively integrated within a brigade and across the range of military operations.

A system OMS/MP contains the tasks, conditions and standards that a system must perform so that the overall formation's missions can be completed. A system OMS/MP is used as a tool to focus overall system design for both the materiel developer and contractor communities. It is used to establish the key attributes of Reliability, Availability and Maintainability (RAM) and serves as the benchmark document for establishing test plans and procedures to asses RAM and other system capabilities. A system OMS/MP supports test planning by providing quantitative testable metrics defining qualitative operational conditions (e.g., mathematical representations of soft soils for mobility studies, slope and obstacle traversing measures, temperature and other climatic conditions, etc).

Both OMS/MPs are source documents for many agencies during the materiel acquisition process. They include the logisticians, testers and evaluators, capability developers, organization documenters, analyst, trainers, operational planners, and manpower resources.

This guide contains answers to frequently asked OMS/MP questions, example of both formation and system OMS/MPs, and a reference link to several actual OMS/MPs produced for a variety of Army systems. The completed OMS/MP is forwarded to TRADOC, ARCIC, CARD for retention and use as rationale and support for those essential characteristics inserted into the applicable JCIDS capability requirements document.

Frequently Asked Questions

What is an OMS/MP? In a macro sense, an OMS/MP defines the individualized context by which a formation or system will be designed and evaluated against its intended operational environment. At a more micro level, an OMS/MP describes the anticipated mix of ways units, by unit or mission task mix, are envisioned to use equipment during a typical year in peacetime and wartime across the range of military operations. It includes the percentage of time the system will be exposed to each type of environmental condition. It also addresses storage, transportation, and strategic deployment. The use of the terms "mission" and "operational mode" are interchangeable since they both serve to facilitate a common understanding of how the commander broadly intends to operate. Therefore when you see one of these terms within this document, it is interchangeable with the other.

- **What is an Operational Mode Summary** (**OMS)?** The OMS section contains a description of the concept of employment, describes all types of operational modes that apply to the system, and shows the anticipated relative frequency of occurrence of these modes during the life of the system as it functions across the anticipated operational environment. The OMS is a roll-up of the piece of equipment wartime usage for the number of mission/combat operations (mission profiles) that are being analyzed to determine (as appropriate) the total operating time (TOT), alert time (AT), and calendar time (CT) associated with each mission profile. The development or application of all operational modes may not apply equally to all systems. Care should be given to tailor the OMS section of the OMS/MP to capture those modes that are relevant.

- **What is a Mission Profile (MP)?** The MP section is a time-phased, detailed description of the operational events (equipment usage) and environments (natural and man-made) that a formation or system experiences from the beginning to the end of a specific mission. In our context, they represent the three conditions of Offense, Defense and Stability Operations that occur within each mission. These specific phases are intended to answer the question of, "How is the formation or system used within an Operational Mode". There is a mission profile for each mission/combat operation in the equipment's wartime OMS. It identifies sequentially the "Task/Event", "Number of Occurrences" for each task/event, "Time required performing each Task/Event," and "Calendar (CT) for each Task/Event" for each mission profile. The CT equals the TOT and AT. It quantitatively depicts specific amounts of operation (e.g., hours, rounds, miles, cycles etc.) for each mission profile.

When used as s document supporting a system, the OMS/MP can help provide the basis for the essential characteristics described in a CDD and CPD; these include Key Performance Parameters (KPPs), Key System Attributes (KSAs), and other Performance Attributes described in the capability requirements document(s). The KPPs are defined as those attributes or characteristics of a system that are considered critical or essential to the development of an effective military capability and those

attributes that make a significant contribution to the characteristics of the future joint force. The KSAs are attributes or characteristics considered crucial in support of achieving a balanced solution/approach to a KPP or some other key performance attribute. The rationale for the values of these characteristics can be supported by the OMS/MP. If the OMS/MP is used, this means that for any KPP, KSA, or other performance attribute that a system is required to meet, it is implied that it must meet them while being used in the manner described in the OMS/MP.

The OMS/MP can also provide source information for other uses. Such as forming the basis for future usage profiles used to develop the force structure in the Total Army Analysis (TAA) process, or as a source document used to build the congressionally mandated Manpower Estimate Report (MER). It can also be a source of information for the development of the equipment usage profile (EUP) database for future systems.

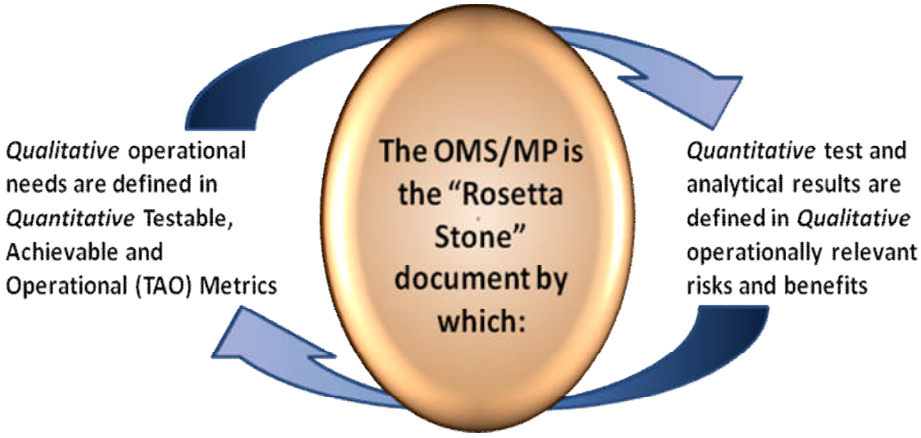
There is no standard format or length for an OMS/MP; it is tailored to fit the formation or individual system. It must be detailed enough however to provide the acquisition community (program managers, system designers, logisticians, testers and evaluators, capability developers, organization documenters, analysts, trainers and operational planners) the information they need to develop, test and evaluate the formation or systems intended capabilities in an operational environment. Common components of an OMS/MP include the following:

- OMS section.
  - Concept of employment within the anticipated operational environment.
  - Types of missions/combat operations and descriptions that apply to the formation or system as anticipated within the operational environment across the Army's range of military operations.

- MP section.
  - Describes the details of each anticipated mission by identifying sequentially the task/event, number of occurrences, time required to perform each task/event/duration, and total operating time for each task/event.
  - Environmental conditions (climactic, terrain, and man-made) applicable to missions (see Appendix C for a more detailed description of environment in an operational context).
  - Operating times, rounds, miles, etc. (as applicable) for the total formation or for systems found within the formation.
  - Supply demands of the formation or cargo load conditions (full, partial, empty) a of a system should be considered as these may have impacts on operational dynamics or may affect the use of the formation or system within each element across the range of military operations.

Why is the OMS/MP important? An accurate and thorough OMS/MP based on the CONOPS or combat scenario deemed to be the most representative, is critical to ensuring the fielding of new equipment will meet the Soldier's needs in battle.

Formation and system OMS/MPs begin with the use of the ARCIC-approved common scenarios supporting the ARCIC Joint and Army Concepts Division (JACD) during the Concept-to-Capability Cycle. An OMS/MP serves as a roadmap for formation/system design, test and evaluation (T&E) planning, estimation of cost/burden for the formation/system, etcetera.



If the OMS/MP is wrong, or under-subscribes the true utilization or environment, there is a high risk of fielding something to the Soldier that, despite passing Army testing, does not meet his/her needs in battle. If the OMS/MP over-subscribes the operational environment, you run the risk of incurring unaffordable costs by forcing compliance with standards not necessary for the operational intent. There is a fine line between the two ends of the spectrum that must be walked, ensuring an appropriate environment is captured within the OMS/MP. History is filled with cases of fielded equipment that were inadequate to accomplish the mission because the equipment's design was based on erroneous assumptions based on the wartime mission profile or expected operational environment. From the early versions of the M16 rifle and its corrosion-induced jamming problems, to performance degradation of the High Mobility Multipurpose Wheeled Vehicle (HMMWV) due to overloading, it is clear that a complete understanding of future usage and environment is key to insuring its design will be sufficient to do the job. This is the failure of the CDD or CPD to state the necessary requirement for the piece of equipment. While an OMS/MP alone would not address failures directly, it's quantitative depiction of the anticipated wartime and peacetime usage and the environmental factors that affect the employment of the formation or piece of equipment are critical to establishing the criteria for testing and evaluation and can sometimes focus additional efforts in requirement refinement within the base capability requirements document.

Who Develops the OMS/MP?

- Formation OMS/MP development: The Capabilities Development and Integration Directorate (CDID) responsible for each formation develops and conducts proponent-wide staffing of the formation OMS/MP describing expected missions, units, peacetime and wartime uses, geographic environments, and the support

and maintenance plans as described in associated doctrine and concepts. Formation OMS/MPs are developed by: the Maneuver Center of Excellence (CoE) for the Brigade Combat Teams and Reconnaissance and Surveillance Brigades; the Fires CoE for the Fires Brigade; the Aviation CoE for the Combat Aviation Brigade; the Maneuver Support CoE for the Maneuver Enhancement Brigade; and Sustainment CoE for the Sustainment Brigade.

- System OMS/MP development: The system's force modernization proponent is responsible for generating, updating and archiving the system OMS/MPs. System OMS/MPs must be consistent with the OMS/MP of the organization that contains the system. To ensure this, system OMS/MPs must make use of the ARCIC-approved common scenarios used for the formation OMS/MPs where the system is located. A system that is in several formation types must contain mission profiles depicting its use within each formation.

When is the OMS/MP Developed?

- Formation OMS/MP development: Formation OMS/MPs are developed from the ARCIC-approved common scenarios in support of the ARCIC JACD Concept-to-Capability Cycle. The CDID responsible for each formation identifies the appropriate systems for inclusion within the formation OMS/MP and coordinates with the capabilities developer responsible for those systems.

- System OMS/MP development: A system level OMS/MP must be developed for all ACAT I systems as well as those systems identified by the proponent as requiring RAM attributes. System OMS/MPs are approved concurrently with the approval of the associated CDD or CPD. System OMS/MPs will be updated only when its associated CDD or CPD is revised. If formation or system concepts-of-use change between updates of the CDD or CPD, the proponent will perform an impact assessment of the newly emerging versus previously approved usage to identify any required capability changes that may have occurred.

What are the uses of an OMS/MP? Historically, the primary use (and usually the primary driver of OMS/MP development) has been as a tool to focus overall formation and system design. In many cases, it serves as the key "Rosetta Stone" document, translating qualitative operationally based capability needs into testable and measurable analytical metrics. As a compliment to this role, the OMS/MP serves as the benchmark document for establishing test plans and procedures for materiel systems and for formation experimentaion. The OMS/MP finds its place, as a major component, of the Doctrine and Organization Test Support Package (D&O TSP) and other test procedural documents. Information captured within an OMS/MP (i.e., terrain profiles, environmental conditions, storage and shipping, etc.) not only serve to establish the conditions under which the Key attributes of RAM are evaluated, but also support and (in some cases justify) performance test conditions by providing quantitative testable metrics defining qualitative operational conditions (i.e., mathematical representations of soft soils for mobility studies, slope and obstacle traversing measures, temperature and

other climactic conditions specified for geographic locations anticipated in the range of military operations, etc).

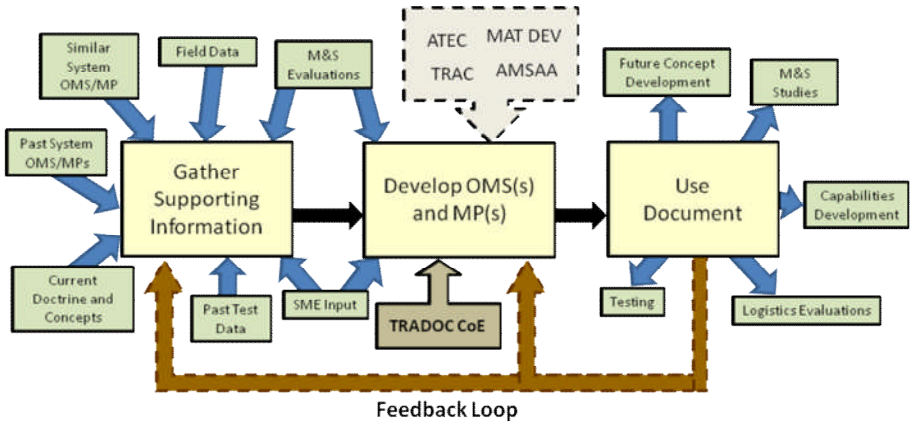
Similar to the applications in testing and evaluation, the use of the OMS/MP data also applies in modeling and simulation. Evaluation of a formation or system based on an OMS/MP can lead to acceptance of, or changes to, organizational design, fleet composition, planned basing or pre-deployment concepts, etc. Analysis agencies throughout the Department of Defense and the Defense Industry relies heavily on the accuracy and completeness of an OMS/MP in predicting or recommending solutions for operational demands in both ongoing and planned actions and environments.

The use of OMS/MPs by logisticians is another application, which can have far reaching budgetary impacts. The time phased structure of an OMS/MP can be used in planning for scheduled maintenance tasks, overhaul or retrofitting plans, and the overall Operation and Maintenance, Army (OMA) component of an organization's working budget. With the results from modeling and simulations based on the OMS/MP, and from T&E results performed against the OMS/MP, logisticians can better prepare recommendations for, or provide informed input to, decisions involving sustainment planning implementation.

Guidance, Policy, Procedure

Development from Scratch or from a Past System

The procedures for developing an OMS/MP are the same regardless of whether you are starting from scratch for a new start program, if you are developing an OMS/MP "replacing" an existing Army system or if you are capturing the mission use of a brigade level formation. Obtain the appropriate scenarios for governing the use of the formation and system, identify the missions appropriate for the condition level, and describe the formations/systems operations to the task/conditions/standards level for the offensive, defensive and stability mission profiles.



Normally, multiple scenarios are used to capture the full range of mission profiles the formation or equipment must accomplish. Sources for scenarios are the ARCIC JACD

and the TRADOC Analysis Centers (TRAC). The capability developer should consult with the materiel development community, the T&E (ATEC and AEC) community, and AMSAA to determine if these organizations have any useful information on current mission operating environments or current mission profiles. Other documentation sources upon which an OMS/MP may be based include:

- Defense Planning Guidance.
- Existing doctrine or emerging doctrine based on new or changed concepts.
- Universal Task Lists (both Joint and Army)
- Tactics, Techniques and Procedures (TTP).
- Lessons learned.
- Operational plans.
- Modeling and Simulation results.
- OMS/MPs or the wartime usage rate database for existing similar equipment.
- OMS/MPs from predecessor systems

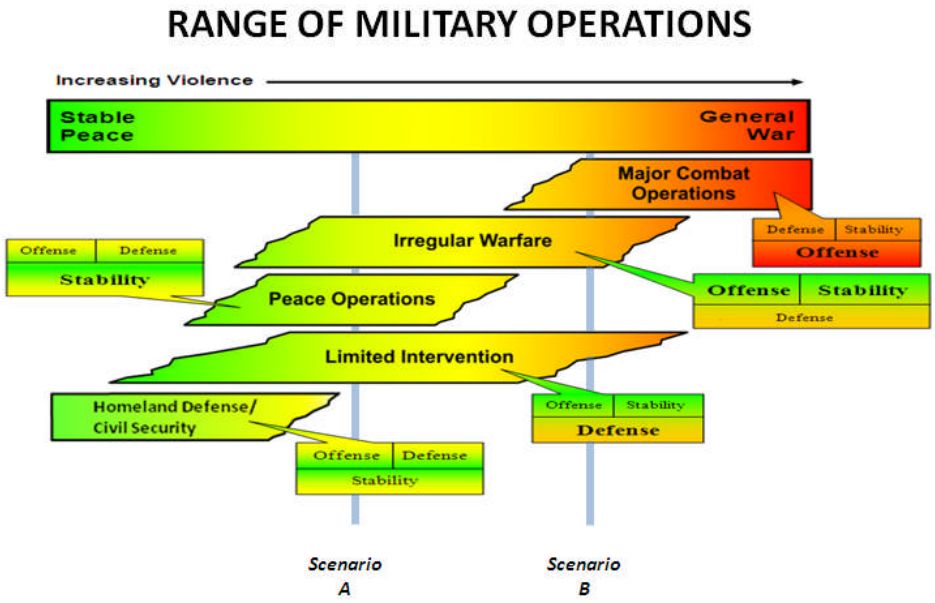
Technical support regarding how to structure an OMS/MP may be obtained from the CoE resident ARCIC RAM engineers. They can provide guidance on what information is required and what format is best to build an effective OMS/MP for a system. They are one of the major users of the OMS/MP and rely upon it to provide a basis for their development of system RAM requirements. They are not however the source for the information that goes into the OMS/MP.

Determining an Operational Mode Summary

There is no standard set of mission guides that can be applied to developing an OMS for every formation or piece of equipment. Each must be tailored to the specific operational requirements, the scenario, and the expected environmental conditions.

As a hypothetical example, the two scenarios depicted below (Scenario A and Scenario B) might be identified as those which represent the “Missions” of an “Example Formation”.

Our “Example Formation” would then have Scenario A with three missions: Irregular Warfare, Peace Operations, Limited Intervention. Each of the missions is further broken down into Offensive, Defensive, and Stability mission profiles. In this particular case, our “Example Formation” is also involved in Scenario B. Here it would have the three missions: Major Combat Operations, Irregular Warfare, and Limited Intervention. And again these would be further broken down into Offensive, Defensive and Stability mission profiles.



Scenario A
- Irregular Warfare
  -- Offense
  -- Defense
  -- Stability
- Peace Operations
  -- Offense
  -- Defense
  -- Stability
- Limited Intervention
  -- Offense
  -- Defense
  -- Stability

Scenario B
- Major Combat Operations
  -- Offense
  -- Defense
  -- Stability
- Irregular Warfare
  -- Offense
  -- Defense
  -- Stability
- Limited Intervention
  -- Offense
  -- Defense
  -- Stability

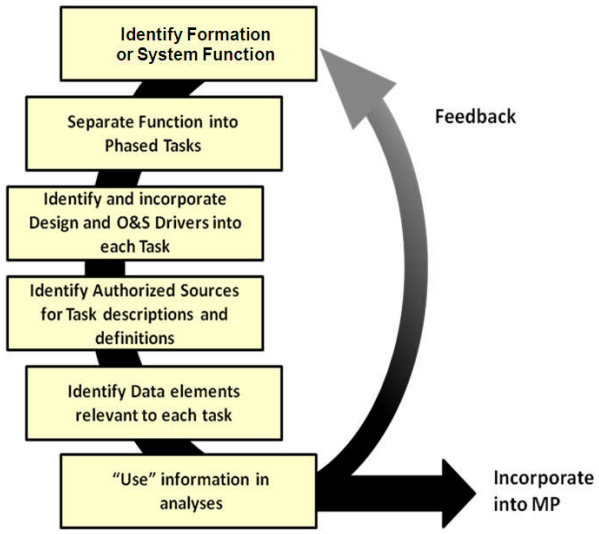
In general, all OMSs should contain the following:

- **Operational Mode Summary Contents**
  - The OMS is a statement of broad missions that the formation or system will be expected to perform on the battlefield.
  - The OMS should address the range of military operations.
  - When appropriate, the OMS should address special conditions of use, such as any unique high-intensity cycles of use within a mission.
  - The OMS should show the expected number of occurrences, operating time, calendar time of each mission or the percentage of the formation or systems involved in each mission.
  - The OMS should show the expected breakdown of environmental conditions expected.
  - The OMS should state the total operating time for each mission.

- When appropriate, the OMS should state the alert time associated with each mission. Alert time is time that the formation or system is required to be ready and committed to the accomplishment of a specific mission but is not yet committed.

Determining a Mission Profile

Upon completing an investigation of data available from the TRADOC approved scenarios, past conflicts, military intelligence, and any other relevant source, the capability developer identifies the user's needs and sets the conditions under which the formation or system will be used across the range of military operations. Development of each mission profile generally moves along the following path:



After analyzing the above data sources, the analyst breaks out each of the missions into the mission tasks or operational events that the formation or system must complete to accomplish the particular mission. Some of the tasks may be common to several or all of the missions. In general, all mission profiles contain the following:

- **Mission Profile Contents**
  - The mission profiles should be based on a typical scenario for the system.
  - The mission profiles should identify the mission tasks, or operational events that the formation or system must complete to accomplish the particular mission.
  - The mission profiles should state specific amounts of operation (e.g., hours, rounds, miles, or cycles) for each mission essential function within the mission.
  - The mission profiles should be consistent with future doctrine and tactics.
  - The information can be provided on a time-line, a summarization, or any other appropriate format.
  - The environmental conditions for each mission should be included in the mission profile.

Multifunctional systems, especially those where capability must be continuous (e.g., command and control systems), must be accurately profiled since the task profile will also help determine the amount of redundancy the materiel developer will have to build into the system to meet mission requirements of the formation where the system is located. The operational tasks or events may be:

- Multifunctional. An item performing several tasks such as tank shooting, moving and communicating.
- Single-Function continuous. An item continuously performing one task such as surveillance radar.
- Single-Function cyclic. An item performing the same task repeatedly such as a missile launcher or artillery piece.
- Single-Function, One-Time. An item performing only a one-time task such as a missile or munition.

Checklist

The following list of questions, when answered within the pages of a formation or system OMS/MP, serves to focus the OMS/MP developer towards a document capable of serving the needs of the acquisition community. Please note that this checklist should be considered as a tool to assist the OMS/MP developer in forming the basic structure of the document and should not be considered all inclusive. Additionally, this list should help to identify what are the relevant drivers and the source data for those drivers.

- Are the mission profiles qualitatively described in terms such as hours, miles, and rounds?
- Does the OMS/MP address the range of military operations?
- Is the expected percentage of use and/or event duration and frequency given for each mission profile?
- Does the OMS/MP contain the expected mix of movement terrain, if applicable?
- Does the OMS/MP describe the deployment of the fleet in the applicable climatic categories?
- Is the average usage (e.g., hours, miles, rounds) given for the period of time considered?
- Is the OMS/MP consistent with the future doctrine and tactics?
- How will the incorporation of the system into a formation or the formation into a joint force affect the use of the other organic systems (if at all)? Will the OMS/MP for other systems within the formation require updating?
- How will the formation's CONOPs be affected by the incorporation of the system (if at all)?
- Are operating and alert times included for each mission profile when appropriate?
- Are the tasks listed for each mission?
- Is it possible to identify when and how long each element of the formation or system is to be used, e.g., is the usage of the mobility portion of a communication

system identified? Is the movement to contact captured for the formation as a unit?
- Is the OMS/MP adequate for structuring tests during development?
- Have you determined whether or not your formation or system operation may be degraded by atmospheric or terrain conditions?
- Have you listed other environmental concerns or constraints that should be considered in the design process? For example, as a result of the movement of the formation will your system be required to swim or climb steep banks when fording streams?

Updating an OMS/MP

Updating an OMS/MP should be based on the anticipated need of the update and what developmental activities form an opportunity to learn and therefore provide information allowing for an update to the OMS/MP. As a system moves through its milestones or as one formation feeds the development of another, the owner of an OMS/MP should take any and all available opportunities to enhance or expand upon an existing one. Since the initial development and archiving of an OMS/MP will coincide with the development and archiving of the base document (a CDD/CPD or a Concept-to-Capability plan), the update of an OMS/MP will usually coincide with the update of the underlying scenarios. Some key events which might cause the revision or update to an OMS/MP could be the reaching of a Milestone date for the formation program (i.e., as the system reaches Milestone C, the system OMS/MP may need to be revised based on lessons learned during the developmental phase of the program or as an experiment on a brigade gathers and implement lessons learned from the evaluation), or the attainment of a date where decisions will be made. Additionally, a revision to an OMS/MP could result from a fundamental shift in formation or system direction as a result of adjustments to key CONOPS driving acquisition strategies. Lastly, the future procurements of similar system or replacement system or upgrade system within a formation may cause the need to update or adjust the Mission Profiles contained within the OMS/MP. In all cases however, the updating of an OMS/MP will follow the same methodology, as the creation from scratch process: Obtain the appropriate scenarios for governing the use of the formation and system, identify the missions appropriate for the condition level, and describe the formations/systems operations to the task/conditions/standards level for the offensive, defensive and stability mission profiles.

Summary

As depicted in the “Example Formation” above, once the Formation OMS and its associated MPs are established, the resulting Formation OMS/MP would be used as the common standard by which the organic system OMS/MPs would be based. This construct can be readily expanded to address extremely complex formations and systems with multiple OMSs and MPs. It is up to the capability developer to examine every angle of the new system’s operation and environment and to document the appropriate amount of information in the OMS/MP to ensure that when the system is eventually designed, tested, produced and fielded, that it meets the needs of the Soldier.

Appendix A: EXAMPLE OMS/MPs

(Please note that these examples were developed before the Army Doctrine Publication (ADP) 3-0, *Unified Land Operations* replaced FM 3-0, *Operations*. As a result some terms within the examples do not correspond with current doctrinal terminology. The development process is the same however. As new OMS/MPs are developed and approved, they will be made available on the ARCIC Portal.)

18 December 2009

HEAVY BRIGADE COMBAT TEAM
OPERATIONAL MODE SUMMARY/ MISSION PROFILE

1. Purpose. The Operational Mode Summary/Mission Profile (OMS/MP) describes the anticipated mix of missions the Heavy Brigade Combat Team (HBCT) will encounter in periods of peace, crisis, national conflict, and war. It also provides the anticipated conditions (climate, terrain, battlefield environment, etc.) in which the HBCT will execute those operations. The information presented in the OMS/MP is a structured, quantitative picture of equipment usage for typical missions with representative profiles for each mission. It establishes a baseline for HBCT operations focusing on utilization rates of the major ground combat platforms within the brigade. The HBCT OMS/MP is a supporting document for CDD development and related analyses requiring operational tempos for HBCT ground combat platforms. This OMS/MP is also a source document for many agencies, logisticians, capability documents writers, organizational document writers, trainers, testers, system evaluators, operational planners, and manpower resource personnel during the materiel acquisition process. This OMS/MP provides a framework for usage rates directly applicable to reliability, availability, and maintainability (RAM) testing for HBCT platforms and equipment if no specific OMS/MP exists. This OMS/MP will be maintained and updated by the MCoE as additional data is collected and analyzed from theater operations, Modeling and Simulation (M&S) events, and other relevant sources of ground combat platform operations.

2. Concept of Operations. America's future strategic, operational and tactical environments increase the imperative to maintain and improve a full spectrum force to support the Joint Forces Commander (JFC) in Major Combat Operations (offensive, defensive, and security), irregular warfare, stability operations in small scale contingencies or counterinsurgency operations, homeland defense, and civil support. The HBCT will be part of a full spectrum joint team that is decisive in varying operations against any level threat, in environments of national interest. The Abrams Main Battle Tank (MBT) and the Bradley Infantry Fighting Vehicle (IFV) are the work horses of the mounted HBCT and they provide the JFC versatility, agility, lethality, sustainability, and flexibility to respond across the full range of military operations. The HBCT will support the Joint Force to maneuver to dismantle an adversary's system of offense and defense, assist in preempting their freedom of action, defeat or destroy the threat, and

protect Joint and Coalition Forces. The HBCT enables the JFC to achieve the following range of military operational outcomes:

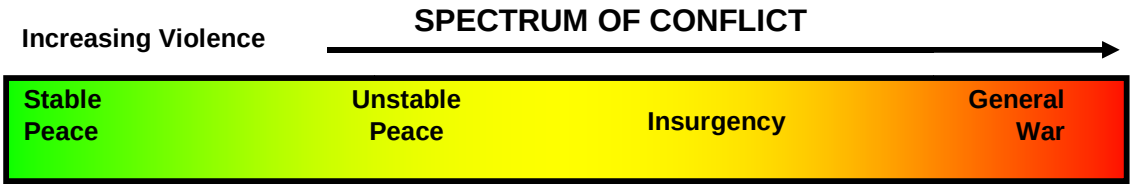
- Destroy, dislocate, or disintegrate the enemy's fighting capability and will
- Apply ground maneuver to secure terrain and protect people, key facilities, and equipment throughout the area of operations creating conditions for stability and civil support operations
- Preserve Joint Warfighting Force combat power by protecting other joint/coalition force personnel and civilians
- Transition rapidly from one engagement to the next and maintain operational tempo
- Enable penetration and sustainment operations in anti-access / area denial environments
- Project overwhelming military land combat power to meet the National Military Strategy
- Dominate the land dimension and force opponents from their protective sanctuaries or destroy them with precision fires and maneuver.

The HBCT is optimized for continuous & simultaneous offensive, defensive, and stability operations during Major Combat Operations (MCO) and Irregular Warfare (IW). The proven mobility, survivability, reliability, and lethality of the HBCT enable the Commander to create and control a relentless operational tempo that overwhelms any threat. This capability enables the HBCT Commander to conduct a well synchronized and integrated assault, rapidly transition to the next engagement, and conduct follow on exploitation operations when required. Combining surprise, firepower, and shock, the HBCT is able to achieve decisive results in a wide range of environments by engaging key enemy elements at the critical time and place necessary to achieve success. As the JFC transitions from a MCO and/or IW operations to Peace Operations, the HBCT's combat platforms will compensate for the capabilities of unexpected threats in a highly ambiguous, complex, and dynamic environment. The Abrams MBT and Bradley IFV provide the physical presence, situational awareness, scalable effects, security, and situational understanding necessary to dominate the tactical environment. They support the HBCTs' operational capability by applying force in the conduct of dominant maneuver to seize, retain, and exploit the initiative, while accepting prudent risk to create opportunities to achieve decisive results. The mobility, survivability, and lethality inherent in the HBCT are the catalysts to synchronized effects proportional to the mission and the operational environment. The effects produced from within the HBCT to create the conditions needed to achieve the military objective include:

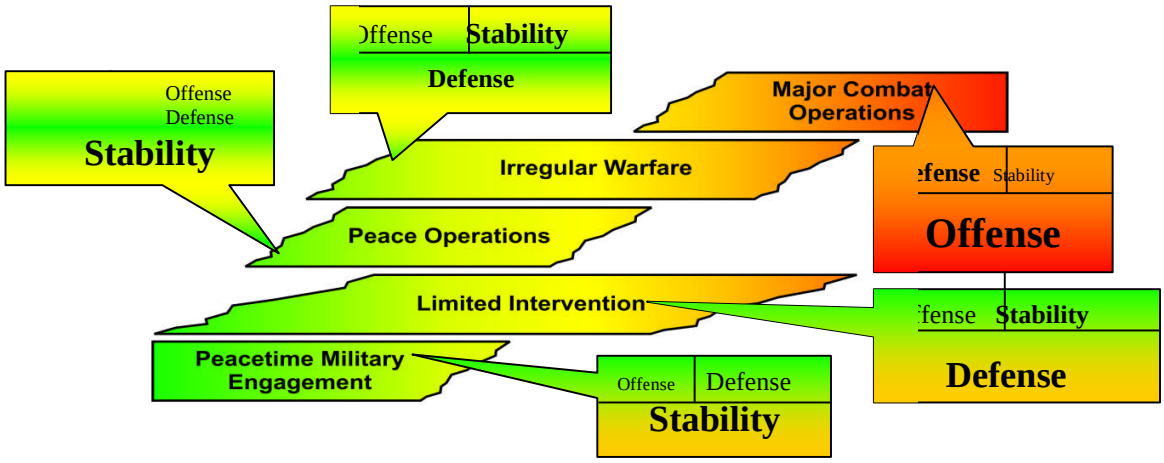
- Fix and isolate enemy forces thereby denying the enemy the ability to maneuver
- Maintain freedom of maneuver for friendly forces
- Initiate decisive engagements with desired effects
- Destroy, disintegrate, or dislocate the enemy's fighting capability and will through maneuver and engagement
- Secure terrain in order to protect people, key facilities, and equipment throughout the area of operations

- Preserve JFC combat power by protecting other joint/coalition force personnel and civilians
- Enable shared understanding, collaboration, and rapid decision making
- Permit warfighter connectivity into the network where and when required on deployable, survivable, distributed, and mobile platforms.

3. Full Spectrum Operations. The foundations for Military operations are contained in its operational concept for full spectrum operations. The goal of full spectrum operations is to apply land power as part of unified action to defeat the enemy on land and establish the conditions that achieve the JFC's end state. The complexity of operational environments requires commanders to combine offensive, defensive, and stability or civil support tasks to complete these operations. In all operations, the objective is to seize, retain, and exploit the initiative while synchronizing actions to achieve the best effects possible.



Operational Themes consisting of Major Combat Operations, Irregular Warfare, Peace Operations, Limited Intervention and Peacetime Military Engagement characterize the missions that the HBCT will be expected to operate in during Full Spectrum Operations.



4. Operational Mode Summary (OMS). For the purposes of this OMS, only 3 operational themes are addressed for the HBCT: Major Combat Operations, Irregular Warfare, and Peace Operations. While the GCV may function within all 5 operational themes, the expected operating tempo within Major Combat Operations, Irregular Warfare, and Peace Operations overshadows those envisioned in Limited Intervention and Peacetime Military Engagement. It is anticipated that if the HBCT performs according to the mission profiles identified here, it will be capable of performing

effectively within the remaining themes. It is important to note that Full Spectrum Operations require simultaneous combinations of three primary elements – Offense, Defense, and Stability operations albeit at different percentages depending on the specific spectrum of conflict. These elements are described below (additional details are contained in FM 3.0).

- Offensive operations are combat operations conducted to defeat and destroy enemy forces and seize terrain, resources, and population centers. In combat operations, the offense is the decisive element of Full Spectrum Operations. Against a capable, adaptive enemy, the offense is the most direct and sure means of seizing, retaining, and exploiting the initiative to achieve decisive results. Executing offensive operations compels the enemy to react, creating or revealing weaknesses that the attacking force can exploit. Successful offensive operations place tremendous pressure on defenders, creating a cycle of deterioration that can lead to their disintegration. In order to achieve desired effects, the BCT Commander employs ground combat platforms to maneuver to positions of advantage, conduct reconnaissance, seize terrain, command and control the operation, and destroy enemy forces by applying overwhelming direct and indirect firepower.

- Defensive operations are combat operations conducted to defeat an enemy attack, gain time, economize forces, conduct replenishment operations, and develop conditions favorable for offensive or stability operations. Normally, defensive operations alone cannot achieve a decision. However, they can create conditions for a counteroffensive operation that lets joint forces regain the initiative. Defensive operations can also establish a shield behind which stability operations can progress and they enable the execution of Combat Replenishment Operations (CRO), Sustainment Replenishment Operations (SRO), and Echelons Above Brigade (EAB) Replenishment Operations (ERO) within the brigade.

- Stability operations encompass various military missions, tasks, and activities conducted outside the United States in coordination with other instruments of national power to maintain or reestablish a safe and secure environment, provide essential governmental services, emergency infrastructure reconstruction, and humanitarian relief. Stability operations can be conducted in support of a host-nation or interim government or as part of an occupation when no government exists. Stability operations involve both coercive and constructive military actions.

The OMS for the HBT is depicted below and represents a notional 180 day campaign during which the brigade transitions from Major Combat Operations to Irregular Warfare Operations followed by an extended period of Peace Operations. The mission elements of offensive, defensive and stability operations are defined by calendar time in hours (hrs) coupled with the percentage of time spent in each operational element. A cumulative total category is also provided to reflect the full 180 day campaign.

Major Combat Operations	*Offensive*	*Defensive*	*Stability*	*Total (hrs)*	*Total (days)*
Calendar Time (hrs)	49	15	8	**72**	**3**
Percentage	68.1%	20.8%	11.1%	-	-
Irregular Warfare	***Offensive***	***Defensive***	***Stability***	***Total (hrs)***	***Total (days)***
Calendar Time (hrs)	48	44	76	**168**	**7**
Percentage	28.6%	26.2%	45.2%	-	-
Peace Operations	***Offensive***	***Defensive***	***Stability***	***Total (hrs)***	***Total (days)***
Calendar Time (hrs)	396	796	2888	**4080**	**170**
Percentage	9.7%	19.5%	70.8%	-	-
Cumulative Total	***Offensive***	***Defensive***	***Stability***	***Total (hrs)***	***Total (days)***
Calendar Time (hrs)	529.5	919	2871.5	**4320**	**180**
Percentage	12.3%	21.3%	66.4%	-	-

5. MCO Overview. The operational framework of a MCO is defined by distinct tactical actions that an HBCT executes to support the JFC scheme of maneuver. These distinct tactical actions are influenced by the changing Operational Environment and may include the following:

- Deliberate Attack to Fix and Isolate the Enemy. The HBCT shapes decisive combat operations with the aid of superior situational understanding, rapid maneuver, and precise effects designed to isolate and fix enemy forces. The HBCT develops the situation by detecting, identifying, and tracking enemy forces to determine dispositions and vulnerabilities. The force then rapidly maneuvers to seize terrain and destroy enemy formations while combining fires to achieve desired effects. This is accomplished outside the enemy's ability to employ effective fires and at a tempo of operations that the enemy cannot match. The HBCT maintains relentless pressure on the enemy eliminating his ability to reposition and reinforce vulnerable forces. In order to achieve desired effects, the HBCT employs its platforms to maneuver to positions of advantage, seize terrain, and destroy enemy forces with overwhelming firepower.

- Exploitation. The HBCT Commander continues his advantage by swiftly transitioning to the exploitation after having dislocated the enemy defense through precise and rapid action at multiple simultaneous points. During this operation the HBCT must develop the situation by employing reconnaissance, integrating Intelligence, Surveillance, and Reconnaissance (ISR) feeds from Division (DIV) and

Joint assets; identifying/locating/prioritizing enemy locations and systems; targeting the most dangerous enemy systems; and engaging those systems with accurate lethal fires from both internal and external assets. The ability to outpace the enemy in this sequence establishes overmatch and underpins the HBCT's versatility to conduct force on force combat by avoiding attrition while defeating the enemy in detail through precise employment of ground combat platforms.

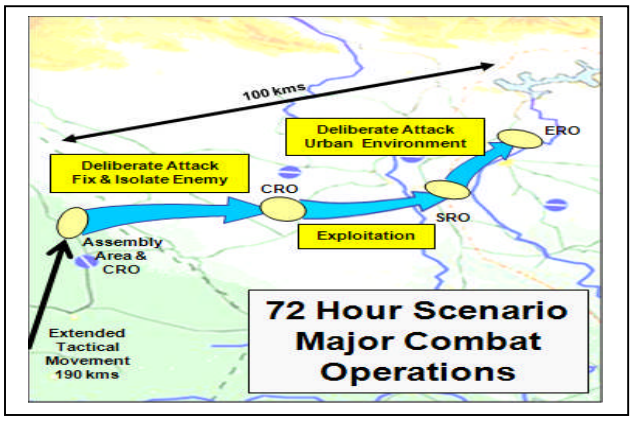
- Deliberate Attack in an Urban Environment. The current Operational Environment (OE) makes it likely that a critical portion of any future campaign will occur in a major urban area. Lethal US long range systems, coupled with expected US air dominance, will most likely drive the enemy away from open areas and into major urban centers where he will attempt to mitigate US advantages and attrit the HBCT in a close fight. The nature of the enemy in the current OE suggests that victory will require the seizure of one or several major urban centers that may be the enemy's power base or his strategic center of gravity. It is clear that in order to accomplish operational objectives the HBCT must be effective in urban and sprawling urban terrains as well as open and rolling terrain. Success in this challenging terrain puts even more of a premium on the survivability and versatility of all ground combat platforms.

- Tactical Movement to an Assembly Area. The HBCT must be able to conduct extended maneuver to a particular area of operations once established in a theater of operations. The enemy must not be allowed to operate at will within the JFC's area of influence. As such, the HBCT must be able to maneuver in a tactical manner over extended distances. This tactical maneuver must be conducted at a rapid rate with the intent of conducting decisive combat operations based on information and reconnaissance updates along the way. The HBCT's ground combat platforms' mobility, cruising range, and speed over all types of terrain enable the Commander to exploit tactical maneuver when required.

- Replenishment Operations. The key to success of the HBCT is its ability to transition rapidly from one mission to the next. The enemy must not be allowed to recover from the rapid, precise strike at one decisive point before he is struck with another. The relatively brief transition period may accommodate a defensive posture, enable reorganization, allow dissemination of new orders, and permit execution of Combat Replenishment Operations (CRO) or Sustainment Replenishment Operations (SRO) within the HBCT. The HBCT will continue to conduct the tactical actions described above provided External Replenishment Operations (ERO) to resupply the HBCT are planned and conducted by organizations located at Echelons Above Brigade (EAB). The ERO is primarily focused on re-supply of the HBCT Brigade Support Battalion (BSB) and may require as much as 8 - 36 hours to complete depending on mission, enemy, terrain and weather, troops and support available, time available and civil considerations (METT-TC).

The HBCT is designed to operate across the full spectrum of operations but is especially suited for offensive operations during a MCO. The HBCT generally conducts operations consisting of multiple tactical actions that are linked in purpose and constrained or extended by logistical support. The quantity and type of tactical actions will vary depending on the commander's intent and specific METT-TC factors. This combination of tactical actions is often referred to as an OMS which reflects the most typical and demanding tactical actions of an operation. An OMS is not necessarily fixed in duration, distance, tempo, or tactical action/mission sequence but is truly dependent on the commander's intent and METT-TC.

- Scenario. All HBCT forces are on the ground and vehicles are at Full Combat Capability (FCC) at the start of the operation. The HBCT conducts an Extended Tactical Movement from the Aerial Port of Debarkation (APOD) to the Assembly Area covering a distance of approximately 200 kms. The Brigade executes a CRO to replenish fuel expended during the movement and prepares for the next operation. The HBCT then conducts a Deliberate Attack of the enemy's main defensive positions followed by another CRO. Taking advantage of the momentum of the attack, the HBCT continues with an Exploitation to assault fleeing enemy forces and clear the Main Supply Route (MSR). At this point, the HBCT executes a SRO to replenish fuel, ammunition, and other needed supplies as well as address critical sustainment maintenance actions. The operation continues with the HBCT conducting a deliberate attack within an urban area to capture its final objective. The example operation would end with the HBCT moving to a defensive posture to execute an ERO supported by EAB prior to seamlessly transitioning to Irregular Warfare Operations. This 72 hour MCO was based on a Southwest Asia (SWA) scenario, derived from wargaming exercises conducted by the Mounted Maneuver Battle Lab (MMBL) Knox in 2007, and characterized by the following key considerations:



  - Enemy portrays the current operational environment employing a complex web defense and asymmetric warfare strategies
  - Liberal Rules of Engagement (ROEs) that enable employment of overwhelming fires as required to defeat the threat
  - CROs and SROs conducted as required using internal and external HBCT assets to maintain the momentum.

Table 5-1 depicts the Operational Mode Summary (OMS) for the 72 hour MCO and provides the specific type of tactical actions/missions, frequency of occurrence, and

mission duration (hours) for each tactical segment. Missions may not necessarily occur in a sequential or independent manner due to the fluidity of combat operations. As with any combat operation, the intensity, duration, and flow of the operation are inherently METT-TC dependent.

Operational Mode Summary - MCO

Tactical Actions	Frequency	Duration (hours)	Total Time (hours)
Extended Tactical Movement	1	8	8
Combat Replenishment Operation (CRO)	1	3	3
Deliberate Attack – Fix & Isolate Enemy	1	15	15
Combat Replenishment Operation (CRO)	1	4	4
Exploitation	1	15	15
Sustainment Replenishment Operation (SRO)	1	8	8
Deliberate Attack - Urban Environment	1	19	19
Total	**7**	**-**	**72**

Table 5-1

The mission profiles for the HBCT's ground combat platforms were derived from multiple modeling, simulation, and experimentation events depicting HBCT operations within a Southwest Asia (SWA) scenario and a 2017 force structure. These events were conducted over a two year period (2006 – 2008) and depict Major Combat Operations for the Abrams and Bradley equipped HBCT. Table 5-2 presents the critical ground combat platform's usage rates resulting from the tactical actions depicted in the Operational Mode Summary; from the modeling, simulation, and experimentation events; and from post exercise analysis of output data. Metrics are presented in rounds (rds), kilometers (kms), and hours (hrs) rounded to the nearest tenth (e.g., 2.4 hrs). The results are tabulated in Table 5-2 for each ground combat platform and depict the cumulative three day total for selected critical categories. The terrain profile is also provided and is presented as a percentage of the total distance moved on primary roads, secondary roads, and cross country (off-road) terrain. *It should be noted that detailed spreadsheets are available for each ground combat platform that depict usage rates for each mission segment within the 72 hour MCO should additional detail be necessary for further analysis or refinement to articulate subsystem operations for a specific ground combat platform. This same set of data was used to develop a detailed Abrams OMS/MP (dated Jun 2009 and approved on 5 Aug 2009) to support the Abrams CDD Annex.*

HBCT MCO Mission Profile

	Abrams M1A2	Bradley M2A3	Bradley FIST	CFV M3A3	HMMWV M1151A1	M2A2 ODS Engr Veh	M1068 / M577
Calendar Time (hrs)	**72**	**72**	**72**	**72**	**72**	**72**	**72**
Distance (kms)	334.3	338.6	343.8	379.9	393.5	360.7	278.2
Engine Move (hrs)	14.1	14.2	11.8	15.1	19.4	13.9	10.1
Engine Idle (hrs)	31.1	52.5	56.3	52.6	50.9	53.8	61.8
Engine ops Total (hrs)	45.2	66.7	68.1	67.7	70.3	67.7	71.9
Aux Power (hrs)	22	2.3	1.6	2.1	0.1	2.1	0.1
C4ISR Systems (hrs)	67.1	69	69.7	69.8	70.4	69.8	72
Primary Wpn (rds)	49	914	679	564	41	283	9
Secondary Wpn (rds)	1732	1710	299	271	0	135	0
Missiles	0	14	0	13	0	0	0
Terrain Profile							
% Primary	32.2%	32.4%	31.4%	25.3%	27.2%	26.1%	37.4%
% Secondary	32.4%	32.6%	32.1%	29.3%	29.8%	29.8%	41.3%
% Cross Country	35.4%	35.0%	36.5%	45.4%	43.0%	44.1%	21.3%

	M1064	Paladin M109A6	FAASV M992A2	M88A1/2	M113A3	M113A3 Amb	HMMWV Amb/997
Calendar Time (hrs)	**72**	**72**	**72**	**72**	**72**	**72**	**72**
Distance (kms)	293.6	284.1	310.3	347.7	311.3	357.7	316.5
Engine Move (hrs)	9.9	9.5	10.7	11.8	10.9	14.7	11.2
Engine Idle (hrs)	50	48.9	49.5	52.1	52.7	53.2	50.6
Engine ops Total (hrs)	59.9	58.4	60.2	63.9	63.6	67.9	61.8
Aux Power (hrs)	8.6	10.6	4.8	3.4	4.1	1	2.5
C4ISR Systems (hrs)	68.5	69.0	65.0	67.3	67.7	68.9	64.3
Primary Wpn (rds)	177	312	0	153	1161	0	0
Secondary Wpn (rds)	0	61	0	0	0	0	0
Terrain Profile							
% Primary	35.6%	37.9%	36.9%	32.3%	34.5%	29.6%	33.6%
% Secondary	40.4%	44.0%	43.8%	44.7%	37.9%	37.1%	39.7%
% Cross Country	24.0%	18.1%	19.3%	23.0%	27.6%	33.3%	26.7%

	HEMTT LHS/1120	HEMTT Wrkr/984	HEMTT POL/978	HMMWV M1152/65	FMTV / LMTV	ACE
Calendar Time (hrs)	**72**	**72**	**72**	**72**	**72**	**72**
Distance (kms)	335	388.4	375.9	296.2	309.6	140.9
Engine Move (hrs)	11.8	16.1	12.8	10.5	11.5	7.7
Engine Idle (hrs)	50.9	49	53.5	59.9	49.5	45.3
Engine ops Total (hrs)	62.7	65.1	66.3	70.4	61.0	53
Aux Power (hrs)	2.7	1.1	1.4	1.1	2.8	1.4
C4ISR Systems (hrs)	65.4	66.2	67.7	71.5	63.8	54.4
Primary Wpn (rds)	0	0	0	0	0	0
Terrain Profile						
% Primary	49.8%	48.8%	51.0%	36.3%	46.8%	10.2%
% Secondary	36.3%	35.4%	35.9%	40.4%	37.1%	34.0%
% Cross Country	13.9%	15.8%	13.1%	23.3%	16.1%	55.8%

Table 5-2

6. Irregular Warfare Operations. An HBCT will be required to conduct operations against an adaptable threat that seeks to engage in Irregular Warfare to break the will of

conventional forces through steady attrition and constant low-level pressure. This broad form of conflict has insurgency, counterinsurgency, and unconventional warfare as the principal activities. Irregular Warfare differs from conventional operations in two aspects. First, it is warfare among and within the people so military power can contribute to the resolution of this form of warfare, but it may not be decisive. Secondly, it avoids direct military confrontation and emphasizes irregular forces using indirect, unconventional methods (such as terrorism) to subvert and exhaust the opponent. As such, it is the only practical means for a weaker (or weakened) opponent to engage, or maintain pressure on, a powerful military force. Irregular Warfare seeks to defeat the opponent's will through steady attrition, constant low-level pressure, and targeting of the populace. This approach creates instability and challenges civil authority to maintain security.

The 180 day notional campaign includes a 7 day period during which the HBCT would conduct Irregular Warfare Operations after completing the 3 day MCO. As such, the HBCT would face the remenants of conventional forces coupled with irregular forces engaging in Irregular Warfare actions. To counter these forces, the HBCT would execute multiple types of missions to include Raids, Area Presence Operations, Perimeter/Area Defense, Replenishment Operations, and Hasty Attacks. Table 6-1 depicts the OMS for this 7 day operation and provides the specific type of tactical actions/missions, frequency of occurrence, and mission duration (hours) for each tactical segment.

Operational Mode Summary – IW Operations

Tactical Actions	Frequency	Duration (hours)	Total Time (hours)
Hasty Attack – Urban Environment	1	24	24
Raids	2	10 - 14	24
Area/Perimeter Defense (with CRO)	2	10 - 14	24
Area Presence (with CRO's)	2	34 - 42	76
ERO/SRO	2	8 - 12	20
Total	**9**	**-**	**168**

Table 6-1

Mission profiles were developed for each ground combat platform based on usage rates derived from similar missions identified in the 2207 Complex Web Defense Experiment conducted by the MMBL at Fort Knox, the 2001 Stryker Operational Mode Summary/Mission Profile, and the 2005 TRAC SBCT Organizational Design Study. Data from each of these sources was reviewed with respect to ground combat platform movement rates, system operating hours, primary and secondary weapon expenditures, and specific mission durations. The data was compiled by platform type/mission role for each mission segment identified in Table 6-1. The results of this effort are depicted in Table 6-2 and represent the cumulative totals for the 7 day Irregular Warfare Operation.

It should be noted that detailed spreadsheets are available for each ground combat platform that depict usage rates for each mission segment within the 7 day operation should additional detail be necessary for further analysis or refinement to articulate subsystem operations for a specific ground combat platform.

HBCT IW Operations Mission Profile

	Abrams M1A2	Bradley M2A3	Bradley FIST	CFV M3A3	HMMWV M1151A1	M2A2 ODS Engr Veh	M1068 / M577
Calendar Time (hrs)	**168**	**168**	**168**	**168**	**168**	**168**	**168**
Distance (kms)	522.5	522.1	432.6	785.2	769.2	571.7	501.8
Engine Move (hrs)	16.3	16.1	14.2	29.6	29.4	33.6	15.2
Engine Idle (hrs)	61.4	101.2	110.3	109.5	109.5	76.6	147.3
Engine ops Total (hrs)	77.7	117.3	124.5	139.1	138.9	110.2	162.5
Aux Power (hrs)	56.1	13.2	5.9	9.1	9.1	9.1	2.9
C4ISR Systems (hrs)	133.8	130.5	130.4	148.2	148	119.3	165.4
Primary Wpn (rds)	17	468	159	109	22	75	0
Secondary Wpn (rds)	102	1096	39	122	-	88	-
Missiles	-	2	-	1	-	-	-
Terrain Profile							
% Primary	32.1%	33.0%	31.8%	21.4%	21.8%	33.2%	35.6%
% Secondary	39.4%	39.5%	39.0%	24.8%	29.5%	39.5%	40.2%
% Cross Country	28.5%	27.5%	29.2%	53.8%	48.7%	27.3%	24.2%

	M1064	Paladin M109A6	FAASV M992A2	M88A1/2	M113A3	M113A3 Amb	HMMWV Amb/997
Calendar Time (hrs)	**168**	**168**	**168**	**168**	**168**	**168**	**168**
Distance (kms)	475.1	299.2	329.2	539.5	521.2	620.3	643.5
Engine Move (hrs)	12.6	9.1	10.3	23.4	18.8	16.8	17.4
Engine Idle (hrs)	111.6	119.5	119.5	111.8	119.2	111.2	110.4
Engine ops Total (hrs)	124.2	128.6	129.8	135.2	138.0	128.0	127.8
Aux Power (hrs)	3.9	4.1	4.1	3.1	1.6	2.1	2.1
C4ISR Systems (hrs)	128.1	132.7	133.9	138.3	139.6	130.1	129.9
Primary Wpn (rds)	154	142	-	28	0	-	-
Secondary Wpn (rds)	-	61	-	-	-	-	-
Terrain Profile							
% Primary	33.8%	32.8%	29.8%	31.7%	31.3%	36.9%	36.9%
% Secondary	39.8%	37.8%	41.7%	39.2%	39.3%	41.5%	41.7%
% Cross Country	26.4%	29.4%	28.5%	29.1%	29.4%	21.6%	21.4%

	HEMTT LHS/1120	HEMTT Wrkr/984	HEMTT POL/978	HMMWV M1152/65	FMTV / LMTV	ACE
Calendar Time (hrs)	**168**	**168**	**168**	**168**	**168**	**168**
Distance (kms)	306.0	339.4	304.5	500.2	278.0	211.6
Engine Move (hrs)	12.4	14.8	12.2	17.5	11.4	16.4
Engine Idle (hrs)	63.7	69	63.1	119.2	64.6	51.3
Engine ops Total (hrs)	76.1	83.8	75.3	136.7	76.0	67.7
Aux Power (hrs)	1.6	1.4	1.6	1.6	1.3	3.9
C4ISR Systems (hrs)	77.7	85.2	76.9	138.3	77.3	71.6
Primary Wpn (rds)	-	-	-	10	-	-
Terrain Profile						
% Primary	29.7%	29.5%	31.8%	31.9%	32.4%	32.3%
% Secondary	40.9%	41.9%	43.0%	40.9%	41.0%	39.1%
% Cross Country	29.4%	28.6%	25.2%	27.2%	26.6%	28.6%

Table 6-2

7. Peace Operations. Although optimized for offensive MCOs, the HBCT is designed to operate across the full spectrum of operations described in Field Manual (FM) 3.0 and possesses the equipment and personnel to make it effective in Peace Operations (Stability and Support/Counterinsurgency (COIN)). In this type of operation, the HBCT would be assigned an Area of Operations (AO) that could contain diverse types of terrain to include major urban areas. The primary role would be the maintenance of stability and security in the AO, although it would also support (and perhaps command and control) simultaneous reconstruction efforts. For the latter, the HBCT could be augmented with additional engineers, military police, civil affairs, military intelligence, ordnance disposal, and special operations forces. AO security would require the decentralized simultaneous execution of a great number of tasks and missions scattered over a large area. Examples of routine tasks and missions an HBCT could be expected to conduct include Forward Operating Base (FOB) security, route reconnaissance and security, convoy security/escort, population engagement, mounted and dismounted patrols, check point and traffic control point operations, reconstruction or critical site security, escorting media and interpreters, and sustainment operations. An HBCT might also conduct company, Combined Arms Battalion (CAB), or higher level operations such as raids, cordons and searches, saturation patrols, joint operations with foreign security forces, and even major offensive operations to clear or secure designated areas. Potential tasks/missions that could be executed by an HBCT CAB on a daily or routine basis include the following:

- Conduct a Raid
- Secure a Fixed Site or Facility
- Defend a FOB
- Execute a Traffic Control Point (TCP)
- Conduct Mounted Patrols
- Conduct Dismounted Patrols
- Conduct Saturation Patrols
- Conduct Cordon and Search Operations
- Conduct Convoy Security/Escort
- Conduct Route Reconnaissance
- Conduct Quick Reaction Force (QRF) Operations

To determine a representative Operational Mode Summary for Peace Operations, data from MMBL-Knox Map Exercise (MAPEX) events conducted during June and July 2007 were evaluated to determine HBCT CAB specific mission sets. These MAPEX events provided the mechanism to evaluate the type, quantity, and approximate duration of missions/tasks that a CAB could be expected to execute over a typical 24 hour period during Peace Operations. As with any combat operation, METT-TC factors drive the actual scope, duration, and frequency of missions within an AO. Table 7-1 depicts a representative OMS that was focused on these operations occurring over a typical 24 hour period (daily combat operations) that would be executed during the notional 170 day period. It is categorized by the mission/task type, HBCT CAB unit/echelon, daily frequency, and average mission duration. These missions/tasks would not necessarily occur in a sequential or independent manner since many tactical actions are conducted

simultaneously by separate task organized units within the CAB. These small units are task organized by the Commander and generally include a mix of combat platforms from within the CAB.

Daily Operational Mode Summary
Stability/COIN Operations

Mission/Task	HBCT CAB Unit / Echelon	Daily Freq.	Mission Duration (hrs)
Mounted Patrol	Platoon (+)	2	8.0
Dismounted Patrol	Platoon/Company	4	3.0
Traffic Control Point (TCP)	Platoon/Squad	5	3.0
FOB Defense	Company (-)	1	24.0
Site Security	Platoon (+)	1	24.0
Saturation Patrol	Company (+/-)	1	6.0
Convoy Escort/Security	Platoon (+/-)	2	3.0
Raid or Cordon & Search	Company (+/-)	1	7.0
Quick Reaction Force (QRF)	Platoon (+)	2	2.5
Total	**-**	**19**	**-**

Table 7-1

In order to develop a daily mission profile for the ground combat platforms with the HBCT, the OMS discussed above was utilized, data from the MAPEX events evaluated, post exercise analysis applied to fill data voids, and results tabulated in spreadsheet format. This data provided total usage rates for most ground platforms supporting the CAB missions identified above. The compiled data was reduced to an individual platform level by dividing the total platform usage rate by the density of platforms within the CAB. The results provided average platform usage rates with respect to distance moved (kms), ammunition expended (rds), and subsystem operating times (hrs) over a typical combat day. For ground combat platforms not portrayed in the MMBL MAPEX (selected HEMTTs, HMMWV's, and FMTVs resident within the HBCT), data from AMSAA's Sample Data Collection (SDC) effort in OIF and OEF was used to determine representative usage rates within the context of the mission profile. The results of this analysis are presented in Table 7-2 as a function of each ground combat vehicle's utilization rates for a typical combat day during the 170 day Peace Operation. Also provided is the terrain profile presented as a percentage of the total distance moved on primary roads, secondary roads, and cross country (off-road) terrain.

HBCT Peace Operations Mission Profile

	Abrams M1A2	Bradley M2A3	Bradley FIST	CFV M3A3	HMMWV M1151A1	M2A2 ODS Engr Veh	M1068 / M577
Calendar Time (hrs)	**24**	**24**	**24**	**24**	**24**	**24**	**24**
Distance (kms)	19.2	20.2	11.5	44.0	26.4	14.0	3.3
Engine Move (hrs)	0.9	1.1	0.9	1.2	0.7	0.5	0.3
Engine Idle (hrs)	4.6	7.0	4.5	3.1	1.8	0.9	22.7
Engine ops Total (hrs)	5.5	8.1	5.4	4.3	2.5	1.4	23.0
Aux Power (hrs)	5.5	0.8	0.1	0.1	0.1	0.1	0.1
C4ISR Systems (hrs)	11.0	9.7	5.5	4.4	2.7	1.5	23.1
Primary Wpn (rds)	1	4	0	7	23	0	0
Secondary Wpn (rds)	28	38	0	38	0	0	0
Missiles	0	0	0	0	0	0	0
Terrain Profile							
% Primary	50.1%	31.7%	36.1%	57.4%	57.4%	33.0%	35.0%
% Secondary	35.6%	48.0%	45.9%	6.4%	6.4%	10.0%	45.0%
% Cross Country	14.3%	20.3%	18.0%	36.2%	36.3%	57.0%	20.0%

	M1064	Paladin M109A6	FAASV M992A2	M88A1/2	M113A3	M113A3 Amb	HMMWV Amb/997
Calendar Time (hrs)	**24**	**24**	**24**	**24**	**24**	**24**	**24**
Distance (kms)	2.3	4.1	0.1	5.8	4.0	4.3	11.2
Engine Move (hrs)	0.1	0.3	0.1	0.3	0.3	0.3	0.5
Engine Idle (hrs)	6.8	7.8	0.3	4.0	5.5	6.1	5.2
Engine ops Total (hrs)	6.9	8.1	0.4	4.3	5.8	6.4	5.7
Aux Power (hrs)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
C4ISR Systems (hrs)	7.0	8.2	0.5	4.4	5.9	6.5	5.8
Primary Wpn (rds)	1	1	0	0	15	0	0
Secondary Wpn (rds)	0	0	0	0	0	0	0
Terrain Profile							
% Primary	26.7%	52.6%	100.0%	36.7%	33.3%	58.1%	53.6%
% Secondary	44.4%	32.7%	0.0%	46.3%	46.7%	34.9%	44.6%
% Cross Country	28.9%	14.7%	0.0%	17.0%	20.0%	7.0%	1.8%

	HEMTT LHS/1120	HEMTT Wrkr/984	HEMTT POL/978	HMMWV M1152/65	FMTV / LMTV	ACE
Calendar Time (hrs)	**24**	**24**	**24**	**24**	**24**	**24**
Distance (kms)	11.4	12.2	6.5	16.3	9.8	8.0
Engine Move (hrs)	0.7	0.9	0.5	0.7	0.4	0.6
Engine Idle (hrs)	1.9	3.3	1.7	7.6	1.6	3.6
Engine ops Total (hrs)	2.6	4.2	2.2	8.3	2.0	4.2
Aux Power (hrs)	0.1	0.1	0.1	0.2	0.1	0.1
C4ISR Systems (hrs)	2.7	4.3	2.3	8.4	2.1	4.3
Primary Wpn (rds)	0.0	0.0	0.0	0.0	0.0	0.0
Terrain Profile						
% Primary	52.6%	57.4%	46.2%	49.1%	51.0%	33.0%
% Secondary	43.9%	41.0%	46.1%	42.9%	41.0%	10.0%
% Cross Country	3.5%	1.6%	7.7%	8.0%	8.0%	57.0%

Table 7-2

8. Overall Campaign Mission Profile. In order to depict a mission profile for the entire 180 day campaign, the 3 day MCO, 7 day Irregular Warfare, and 170 day Peace Operation are combined into a single mission profile. The profile depicts the cumulative usage rates for each ground combat platform over the 180 day period and is present in Table 8-1.

For annual wartime usage rate computations, it is envisioned that an HBCT has the capability to conduct two 180 day operations allowing for fluctuations in combat intensity during a year long deployment. This annual wartime rate is addressed to provide planning factors for follow-on logistical and RAM analyses that focus on sustainment issues for year long deployments. As with any operation, METT-TC will be the driver for the concept of operations, sequence of missions, operational tempo, and duration of employment. This option provides a baseline for analyses conducted to address annual HBCT logistics and sustainment issues.

9. Environmental Conditions. Adaptive opponents will also use weather as a force multiplier. Adverse weather degrades the HBCT's ability to conduct reconnaissance and see first. High winds may limit Unmanned Aerial System (UAS) operations thereby limiting aerial reconnaissance. Future enemies will leverage adverse weather, whenever possible, to reposition forces, to conduct attacks, and to resupply. As in other aspects of the OE, future opponents will leverage knowledge of local and regional weather to achieve the greatest possible effect on the HBCT. A range of challenging weather and climatic conditions will characterize those environments where the Abrams equipped HBCT and Joint Forces will operate. Temperatures will range from debilitating cold to enervating heat. Temperature extremes (both hot and cold) will challenge Soldier endurance as well as high-tech system performance. The future opponent will be thoroughly acclimated to his own weather conditions, and will understand how to use it to maximum advantage. Therefore, the Abrams MBT is expected to operate in, or be exposed to, the climatic conditions of hot, basic, and cold as defined in Army Regulation (AR) 70-38 and depicted below:

Climate	Operating Temperature
Hot	up to 120^0F
Basic	-25^0F to 110^0F
Cold	down to -50^0F

AR 70-38 temperatures stated above reflect ambient air temperatures not internal vehicle temperatures or external surface temperatures which may be much higher than 120^0F (note that peak ambient air temperatures in Iraq have exceeded the 120^0F mark for limited periods). It is also anticipated that 50-80% of combat operations will be conducted in reduced visibility conditions. These conditions include haze, fog, dust, blowing sand, precipitation, limited light, overcast conditions, and darkness.

HBCT 180 Day Mission Profile

	Abrams M1A2	Bradley M2A3	Bradley FIST	CFV M3A3	HMMWV M1151A1	M2A2 ODS Engr Veh	M1068 / M577
Calendar Time (hrs)	**4320**	**4320**	**4320**	**4320**	**4320**	**4320**	**4320**
Distance (kms)	4120.8	4294.7	2731.4	8645.1	5650.7	3312.4	1341.0
Engine Move (hrs)	183.4	217.3	179.0	248.7	167.8	132.5	76.3
Engine Idle (hrs)	874.5	1343.7	931.6	689.1	466.4	283.4	4068.1
Engine ops Total (hrs)	1057.9	1561.0	1110.6	937.8	634.2	415.9	4144.4
Aux Power (hrs)	1013.1	151.5	24.5	28.2	26.2	28.2	20.0
C4ISR Systems (hrs)	2070.9	1848.5	1135.1	966.0	677.4	444.1	4164.4
Primary Wpn (rds)	236	2062	838	1863	3973	358	9
Secondary Wpn (rds)	6594	9266	338	6853	0	223	0
Missiles	0	16	0	14	0	0	0
Terrain Profile							
% Primary	46.4%	31.9%	34.8%	52.7%	50.4%	32.3%	35.7%
% Secondary	35.8%	45.8%	43.1%	9.0%	11.2%	17.2%	42.5%
% Cross Country	17.8%	22.3%	22.1%	38.3%	38.4%	50.5%	21.8%

	M1064	Paladin M109A6	FAASV M992A2	M88A1/2	M113A3	M113A3 Amb	HMMWV Amb/997
Calendar Time (hrs)	**4320**	**4320**	**4320**	**4320**	**4320**	**4320**	**4320**
Distance (kms)	1159.7	1280.3	656.5	1873.2	1512.5	1709.0	2864.0
Engine Move (hrs)	39.5	69.6	38.0	86.2	80.7	82.5	110.4
Engine Idle (hrs)	1317.6	1494.4	220.0	843.9	1106.9	1201.4	1048.8
Engine ops Total (hrs)	1357.1	1564.0	258.0	930.1	1187.6	1283.9	1159.1
Aux Power (hrs)	29.5	31.7	25.9	23.5	22.7	20.1	21.6
C4ISR Systems (hrs)	1386.6	1595.7	283.9	953.6	1210.3	1304.0	1180.2
Primary Wpn (rds)	501	624	0	181	3711	0	0
Secondary Wpn (rds)	0	122	0	0	0	0	0
Terrain Profile							
% Primary	31.9%	44.7%	35.0%	34.4%	32.9%	44.5%	47.6%
% Secondary	41.5%	36.4%	41.6%	44.0%	42.3%	37.7%	43.4%
% Cross Country	26.6%	18.9%	23.4%	21.6%	24.8%	17.8%	9.0%

	HEMTT LHS/1120	HEMTT Wrkr/984	HEMTT POL/978	HMMWV M1152/65	FMTV / LMTV	ACE
Calendar Time (hrs)	**4320**	**4320**	**4320**	**4320**	**4320**	**4320**
Distance (kms)	2579.0	2801.8	1785.4	3567.4	2253.6	1712.5
Engine Move (hrs)	141.7	181.2	108.7	147.0	89.0	126.1
Engine Idle (hrs)	443.5	674.1	401.2	1471.1	391.8	708.6
Engine ops Total (hrs)	585.1	855.3	509.9	1618.1	480.8	834.7
Aux Power (hrs)	21.3	19.5	20.0	36.7	21.1	22.3
C4ISR Systems (hrs)	606.4	874.8	529.9	1637.8	501.9	857.0
Primary Wpn (rds)	0	0	0	10	0	0
Terrain Profile						
% Primary	49.5%	52.8%	44.8%	45.6%	48.1%	31.0%
% Secondary	42.6%	40.4%	43.4%	42.4%	40.5%	15.6%
% Cross Country	7.9%	6.8%	11.8%	12.0%	11.4%	53.4%

Table 8-1:

10. References. The following references, data sets, and simulation/experiment reports were used during the development of the HBCT OMS/MP:

- Mounted Maneuver Battle Lab (MMBL) Simulation Exercise for the HBCT OMS/MP - Dec 2007
- MMBL Complex Web Defense (CWD) Report - Mar 2008
- MMBL Sustainment Study Wargame OMS/MP Assessment - Nov 2007
- TRAC Strategic Choices data set - Nov 2008
- TRAC SBCT Organization Design Study Brief - Dec 2005 (SASO and MCO modeling results)
- TSM SBCT Stryker OMS/MP - 2001 (with original support data for SSC missions and 2003 update)
- AMSAA Sample Data Collection (SDC) Operation Iraqi Freedom (OIF) Report - Feb 2008
- AMSAA OEF and OIF Tactical Wheeled Vehicle (TWV) Mission Profile and Fuel Analysis Briefing and data sets – Dec 2009
- MMBL Combined Arms Battalion (CAB) Counterinsurgency MAPEX Results - Jun/Jul 2007
- Final Approved Abrams OMS/MP - Jun 2009 (approved Auq 2009)
- Draft Bradley OMS/MP - May 2009
- MMBL Recon Squadron Experiment Report - Sep 2007
- Future Combat Systems (FCS) BCT OMS/MP - Mar 2008
- Field Manual (FM) 3.0 - Feb 2008
- ARCIC Draft Guide for Development of OMS/MPs - July 2009
- UAMBL OMS/MP Sustainment Replenishment Operation Tasks Report - Jun 2005

Operation Mode Summary & Mission Profile (OMS/MP)

For the

Joint Light Tactical Wheeled Vehicle (JLTV)

Version 3.3

12 January 2012

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Introduction

Purpose

The Operational Mission Summary/Mission Profile describes the anticipated missions, roles and environments the Joint Light Tactical Vehicle (JLTV) will encounter during Full Spectrum Operations. This OMS/MP describes system modes, mission profiles, and usage conditions for the JLTV during its operating life. When approved, it supersedes the OMS/MP published with the JLTV Request For Proposal (RFP) in February 2008, but will not take effect until JLTV EMD phase activities. The OMS/MP supports the basis for essential capabilities described in the JLTV Capability Development Document (CDD) documenting key usage factors directly applicable to design study, logistical analyses, O&S estimation, and reliability, availability, and maintainability (RAM) testing and analyses. JLTV is a Family of Vehicles (FoV) with two categories and various subconfigurations designed to perform specific mission roles (general purpose, close combat weapons carriers, heavy gun carrier, shelter carriers, etc). To clarify the OMS/MP vehicle requirements, an archetypical vehicle is selected as the base mission profile using a weighted average.

Document Overview

The OMS/MP defines the following:

- Expected operational modes.
- Full Spectrum Operations, Operational Themes, and elements of the operational terms (offense, defense, and stability).
- Joint Mission Profile and operational elements.
- Terrain conditions in terms of mileage, speed, and roughness.
- Environmental conditions.

Operational Mode Summary (OMS)

The combination of tactical activities and system states (modes) is referred to as an Operational Mode Summary (OMS) and reflects the ***most typical and demanding*** operations during the three elements of the operation within Major Combat Operation (MCO) and Irregular Warfare (IrW). The following operational mode apply to the JLTV FoV regardless of the Mission Role Variants (MRV) or mission[1]:

- **Dynamic Operation or Movement Time:** vehicle is actively moving with all systems energized.
- **Static Operation or Idle Time:** vehicle is stationary with engine running, mission essential systems energized.
- **Silent Watch Operations Time:** vehicle engine is off with mission equipment energized by battery power.
- **System and Engine Off Time:** means the vehicle is stationary and all systems and engine are shut down.

[1] Other modes exist that were considered insignificant or irrelevant to the JLTV operations.

Other Key Definitions Include:

- **Duration:** Total time in hours accumulated during a task.
- **Distance:** Total distance in miles accumulated during a task.
- **System Cycles on/off**. Number of times the vehicles engine is turned on and off.
- **Terrain.** The different terrains the vehicle is expected to perform on

Operational Context

Full Spectrum Operations

The foundations for Military operations are contained in its operational concept—full spectrum operations[2]. The goal of full spectrum operations is to apply land power as part of unified action to defeat the enemy on land and establish the conditions that achieve the joint force commander's end state. The complexity of operational environments requires commanders to combine offensive, defensive, and stability or civil support tasks to complete these operations. In all operations, the objective is to seize, retain and exploit the initiative while synchronizing actions to achieve the best effects possible.

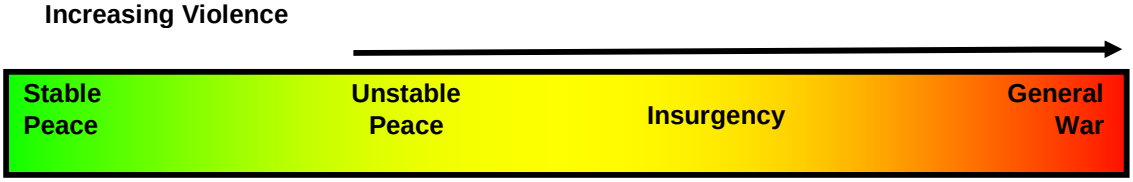


Figure 1. - Spectrum of Conflict

Operational Themes:

Operational Themes consisting of MCO, IrW, Peace Operations, Limited Intervention and Peacetime Military Engagement characterize the missions that will be supported by JLTV. Each theme has a distinct mode profile with various terrain profiles and speeds.

Elements of Full Spectrum Operations

The JLTV was modeled using the operational themes of MCO and IrW. Both themes consisted of a number of different mission tasks within the three elements - Offense, Defense, and Stability or civil support. Full spectrum operations require simultaneous combinations of three elements, each at a different intensity as illustrated in Figure 2. These elements are described below

[2] Field Manual No. 3-0, Operations Headquarters Department of the Army Washington, DC, FEBRUARY 2008

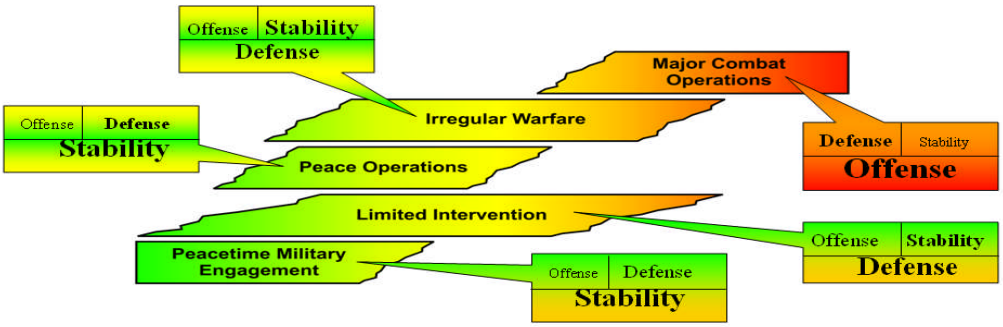


Figure 2. - Elements of Operations within Operational Themes

Offensive Operations:

Offensive operations are combat operations conducted to defeat and destroy enemy forces and seize terrain, resources, and population centers. In combat operations, the offense is the decisive element of full spectrum operations. Against a capable, adaptive enemy, the offense is the most direct and sure means of seizing, retaining, and exploiting the initiative to achieve decisive results. Executing offensive operations compels the enemy to react, creating or revealing weaknesses that the attacking force can exploit. Successful offensive operations place tremendous pressure on defenders, creating a cycle of deterioration that can lead to their disintegration. Primary tasks for offensive operations consist of the following:

- **Movement to contact:** Movement to contact develops the situation and establishes or regains contact
- **Attack:** An attack destroys or defeats enemy forces, seizes and secures terrain, or both
- **Exploitation**: An exploitation rapidly follows a successful attack and disorganizes the enemy in depth
- **Pursuit:** A pursuit is designed to catch or cut off a hostile force attempting to escape with the aim of destroying it.

Defensive Operations:

Defensive operations are combat operations conducted to defeat an enemy attack, gain time, economize forces, and develop conditions favorable for offensive or stability operations. The defense alone normally cannot achieve a decision. However, it can create conditions for a counteroffensive operation that lets joint forces regain the initiative. Defensive operations can also establish a shield behind which stability operations can progress. Primary tasks for Defensive Operations consist of the following:

- **Mobile defense:** The defender withholds a large portion of available forces for use as a striking force in a counterattack.

- **Area Defense:** The defender concentrates on denying enemy forces access to designated terrain for a specific time, limiting their freedom of maneuver and channeling them into killing areas.
- **Retrograde:** Involves organized movement away from the enemy

Stability Operations:

Stability operations encompass various military missions, tasks, and activities conducted outside the United States in coordination with other instruments of national power to maintain or reestablish a safe and secure environment, provide essential governmental services, emergency infrastructure reconstruction, and humanitarian relief[3]. Stability operations can be conducted in support of a host-nation or interim government or as part of an occupation when no government exists. Stability operations involve both coercive and constructive military actions. The Primary Tasks for Stability operations consist of the following:

- **Civil Security:** Involves protecting the populace from external and internal threats
- **Civil Control:** Regulates selected behavior and activities of individuals and groups
- **Restore Essential Services:** Forces establish or restore basic services and protect them until a civil authority or the host nation can provide them.
- **Support to governance:** Establishing security and control, provide a foundation for transitioning authority to civilian agencies and eventually to host nation.
- **Support to economic and infrastructure development:** Support to economic and infrastructure development helps a host nation develop capability and capacity in these areas.

Mission Profile

Mission Profile (MP) describes the details of each specific mission by identifying sequentially the tasks, events, duration, and operating conditions of the system for each action within the mission. The following describes the JLTV FoV operational mode summary mission profiles for a MCO and IrW. Both scenarios incorporate the elements of the full spectrum of operation. MCO and IrW data was developed with information from a war gaming exercise conducted by the Maneuver Battle Lab (MBL), Virtual & Constructive Simulations Division Knox (VCSD-K) using DOD approved scenarios[4]. The war game was conducted using an enhanced Computer Aided Map Exercise (CAMEX) methodology with a Marine Expeditionary Force (MEF) and an Army Heavy Brigade Combat Team (HBCT) reinforced with an Infantry Battalion from an Infantry Brigade Combat Team (IBCT). For more on the CAMEX see the Fort Knox Maneuver Battle Lab, final report "Joint Light Tactical Vehicle (JLTV) Computer Aided Map Exercise (CAMEX)", dated 6 April 2009

[3] Field Manual No. 3-07, Stability Operations Headquarters Department of the Army Washington, DC, OCTOBER 2008

[4] Joint Light Tactical Vehicle (JLTV) Computer Aided Map Exercise (CAMEX) Final Report, 6 April 2009.

Two strategic Defense Planning Guidance compliant scenarios, both set in 2017, were used during the Exercise. The first was a MCO scenario in Southwest Asia, designated SWA 10 by the Army Training and Doctrine Command (TRADOC). The second was a Stability Operations or IrW scenario based in Africa, known as Africa 1.0. Both Army and Marine player teams employed these scenarios as part of a larger joint force, although they each operated in different areas of operations within each scenario.

Major Combat Operations (MCO)

Major Combat Operations involve offensive maneuver against a defending enemy over large distances in relatively short periods of time, as well as defensive operations extended in time and space. Army offensive operations involve movements to positions of advantage via air or land, while Marine offensive operations involve amphibious assault as well as maneuver ashore. MCO occurs over varied terrain, from mountainous to open, desert to urban. Table 1 summarizes the results of the MCO scenario relevant to this OMS/MP. Note, export power and silent watch are kitted capabilities. Where an export power or silent watch is indicated, it applies only to those vehicles with such a kit. Otherwise the associated times are considered engine idle time.

Marine Corps and Army Joint Major Combat Operation (MCO) Scenario with Mission Tasks								
Operational Mode Summary (OMS)	**Mission Profiles (MP)**							
	Offense				Defense		Stability	Total
Full Spectrum Element MCO War Game Phases	Littoral/Air Assault	Movement to contact	Attack	Pursuit	Area Defense	Mobile Defense	Civil Security	
Duration (hours)	5.7	11.4	18.1	5.7	10.9	9.1	11.1	72.0
Distance (miles)	4.6	128.9	18.5	32.5	19.2	17.5	14.7	236
Engine Operations (hours)								
Dynamic Operation or Movement Time	0.9	6.4	4.2	1.4	1.8	2.0	2.5	19.1
Static Operation or Idle Time	2.9	4.8	10.7	3.2	7.4	5.5	7.5	42.1
Total Operating Time (Dynamic + Static)	3.8	11.1	14.9	4.6	9.2	7.5	10.0	61.2
Engine Off Time	1.9	0.3	3.2	1.1	1.7	1.5	1.1	10.8
Battery Power (hours)								
Silent Watch Operating Time	1.8	0.0	2.8	0.8	1.3	1.2	0.7	8.6
Cycles (Numbers)								
Engine on/off Cycles	1	2	3	0	2	1	1	10

Table 1 – MCO Mission Scenario

Irregular Warfare Operations (IrW)

Irregular warfare is defined as an intermittently violent, protracted struggle among state and non-state actors for legitimacy and influence over the relevant populations. IrW favors indirect and asymmetric approaches to a conflict, though it may employ the full range of military and other capabilities, the focus is to erode an adversary's power, influence, and will. IrW includes a broad spectrum of combined arms operations, including those typically associated with MCO, such as raids or deliberate attacks, to those typically associated with Stability Operations, such as checkpoints, convoy operations or infrastructure development. Table 2 summarizes the results of the IrW scenario relevant to this OMS/MP. Note, export power and silent watch are kitted capabilities. Where an export power or silent watch is indicated, it applies only to those vehicles with such a kit. Otherwise the associated times are considered engine idle time.

Marine Corps and Army Joint Irregular Warfare (IrW) Scenario with Mission Tasks							
Operational Mode Summery (OMS)	Mission Profiles (MP)						
	Stability			Defense		Offense	Total
Full Spectrum Element IrW War Game Phases	Civil Security	Restore Services	Support Government	Mobile Defense	Area Defense	Attack	
Duration (hours)	117.6	16.8	6.7	10.1	11.8	5.0	168
Distance (miles)	111.5	38.0	20.3	25.3	43.1	15.2	253
Engine Operations (hours)							
Dynamic Operation or Movement Time	18.1	2.6	1.0	1.6	1.8	0.8	25.8
Static Operation or Idle Time	29.6	10.7	4.3	6.7	7.5	3.2	62.0
Total Operating Time (Dynamic + Static)	47.7	13.3	5.4	8.2	9.3	4.0	87.9
Engine Off Time	69.9	3.5	1.3	1.9	2.4	1.0	80.1
Battery Power (hours)							
Silent Watch Operating Time	16.9	2.4	1.0	1.4	1.7	0.7	24.1
Cycles (Numbers)							
Engine on/off Cycles	11	7	4	4	8	3	37

Table 2 – IrW Mission Scenario

Annual Mileage

The JLTV FoV will accumulate an annual average of 6,000 miles. The annual mileage is accumulated during the year while conducting a mix of MCO and IrW scenarios, each MCO mission consisting of 236 miles and each IrW is 253 miles. This mileage mirrors existing annual usage data of the current light tactical fleet.

JLTV 50 Percentile Annual Combat Usage Data			
	MCO	IrW	Annual
Mission Duration Days	3	7	
Mission Distance Miles	236	253	6,000

Table 3 – Annual Combat Mission Values

Marine Corps and Army Joint Peace Time			
Garrison Annual Usage	Mission Profiles (MP)		
	Peace Time		
	Garrison	Training	Total
Distance (miles)	500	1,000	1,500

Table 4 – Annual Garrison Mileage

Annual Garrison data consists of the activities that normally occur during the year along with associated training. Both the Army and Marine Corps rotate forces into combat operations with a target deployment to dwell ratios unique to each Service. For JLTV, one year of combat operations will be followed by two years of “peace time garrison” this cycle repeats through the life of the vehicle.

Mission Payload

The JLTV and its companion trailer were analyzed using the vehicle’s maximum payload capability and estimated average consumption of material during both the MCO and IrW scenarios. Table 5 describes the frequency at which the vehicle and companion trailer operate under various payload conditions.

Vehicle and Trailer Percent Payload for RAM Testing				
Payload On-Board the JLTV FOV	Payload On-Board Trailer			
	No Trailer	Empty Trailer	Half Loaded Trailer	Fully Loaded Trailer
Empty JLTV (CW + Crew - All Payload)	1%	2%	1%	5%
Half Loaded JLTV (GVW + Crew - 1/2 Payload)	35%	1%	8%	3%
Fully Loaded JLTV (GVW + Crew)	24%	2%	3%	15%

Table 5 – Vehicle and Trailer Payload Cases

Note:
Curb Weight (CW): Empty vehicle, full fuel, lubricants, coolant, basic issue item (BII), on vehicle maintenance (OVM) items, weapon mount, and inherent armor.
Gross Vehicle Weight (GVW): Curb weight plus payload and armor.
Gross Combined Vehicle Weight (GCVW): GVW plus the weight of the tower load.

Mission Equipment

The JLTV FoV will integrate a wide variety of mission equipment, including weapons; C4I equipment; kits, sets, and outfits; and other mission-role specific equipment. Weapon systems and other mission equipment will be operated per their existing mission profile. The JTLV shall consider the equipment's specific mission profiles and operating modes for the purposes of determining duration, cycles, Size, Weight, Power, and Cooling (SWAP-C).

Terrain

The JLTV FoV operational terrain is classified into two overall categories: improved surfaces and unimproved surfaces. Improved surfaces are primary and secondary road ways with some type of all weather surfaces, man-made improvements, and subject to periodic maintenance. Improved surfaces range from paved, high speed roads in excellent condition through rutted and potholed gravel roads. Unimproved surfaces are trails and cross-country "natural" surfaces with no manmade improvements, no maintenance, and subject to variances of weather. Unimproved terrains include, but are not limited to, deserts, grasslands, sand, swamps, forests, tropical jungles, mountains, shallow rivers, and salt water beaches. The JLTV FoV operational envelope requires the capability for extended, effective operation on all terrain surfaces, but particularly on unimproved surfaces, during all weather conditions both day and night with limited and poor visibility.

Terrain values							
Terrain			Average Speed	Wave Number Spectrum	RMS Roughness (Inches)	%	Distance Miles
Improved Surfaces	Primary Surfaces	High Quality Paved Road	55 mph	$G_{XX}(n)=1.4 \times 10^{-8}(n)^{-2.5}$	0.1	10%	25
		Secondary Pavement	50 mph	$G_{XX}(n)=1.9 \times 10^{-7}(n)^{-2.5}$	0.2	10%	25
	Secondary Surfaces	Rough pavement Degraded	40 mph	$G_{XX}(n)=8.0 \times 10^{-7}(n)^{-2.5}$	0.3 – 0.5	10%	25
		MOUT *	N/A	WNS Does Not Apply	N/A	N/A	0
		Loose Surface	35 mph	$G_{XX}(n)=3.0 \times 10^{-5}(n)^{-2.0}$	0.6	18%	45
		Washboard & Potholes	30 mph	$G_{XX}(n)=4.0 \times 10^{-6}(n)^{-2.4}$	0.6 -1.2	10%	25
		Belgian Block	20 mph	$G_{XX}(n)=4.0 \times 10^{-6}(n)^{-2.5}$	0.3 – 0.6	2%	5
Un-Improved Surfaces		Trails	25 mph	$G_{XX}(n)=4.6 \times 10^{-4}(n)^{-1.9}$	1.0 -3.4	20%	50
		Cross-Country	15 mph	$G_{XX}(n)=9.2 \times 10^{-4}(n)^{-2.1}$	1.5 – 4.8	20%	50
						Total	250

* Table 7 - MOUT Discrete Description

Table 6 – Terrain Values

Improved Surfaces:

Primary Surfaces:

Primary surfaces are high quality paved, and secondary pavement with Root Mean Square (RMS) values varying between 0.1 inches to 0.2 inches. They consist of two or more lanes, all weather, maintained hard surface (paved) roads with good driving visibility designed for heavy, high density traffic. These roads have lanes with a minimum width of nine feet (2.75 meters), road crown to 2 degrees and all bridges will support the JLTV FoV maximum GVW/GCW. Secondary pavement can include significantly degraded (potholes, alligator cracking, freeze/thaw breakup) concrete, macadam concrete or asphalt pavements.

Forces in third world countries will find there is no prevalence of paved surfaces and the paved surface that exist are of substandard quality. Secondary pavement is more typical of 3rd world primary roads

Secondary Surfaces:

Secondary surfaces are primary roads with rough pavement, loose surface, loose surface with washboard and potholes, and Belgian block surfaces with RMS values varying between 0.3 inches to 1.2 inches. Third world countries will have large networks of neglected secondary pavement and roads using gravel or similar material as wear surfaces.

Rough pavement is two lane roads with degraded shoulders, and marginal subgrades which produce long wavelength swells and additional degradation of the surface. Grades can vary from 0% up through 6%. Generally, washboard occurs in drier operational areas, whereas pothole gravel roads occur in wet operational areas. These roads are one or more lanes, all weather, occasionally maintained with varying surfaces (e.g., large rock, crushed rock, or gravel) intended for medium-weight, low-density traffic. Bridges on secondary or unimproved roads are typically unreliable in terms of their load bearing capacity, meaning that military traffic must reinforce them, cross with caution, or use available alternative crossing methods, such as fording. Grades can vary from 0% up through 15%.

Military Operations in Urban Terrain (MOUT) combines extensive manmade structures with characteristics of the terrains types described above, but essentially characterized as a mix of improved surfaces and a variety of discrete obstacles. However, as conflicts within built-up areas escalate, collapsed buildings and other damaged structures produce rubble that increases terrain roughness. Sight distance is severely limited and intersections require blind 90 degree turns to narrow streets. Buildings or walls lining streets create channelized pathways which make rubble piles, vehicle carcasses, bomb craters, or defender created obstructions effective barriers requiring a capability to go over rather than around them. There is limited room for vehicle maneuvering to go around obstacles or avoid kill zones due to narrow streets and alleys. Damaged water systems can flood streets to create wet pavement, weaken pavement substructures, destroyed substandard pavement, rut unpaved roads, and produce mud. Relatively good pavement will deteriorate as it is subjected to repeated military combat and tactical wheeled vehicle traffic. The discrete descriptions of the MOUT terrain are detailed in Table 7.

Unimproved Surfaces:

Trails:

Trails are one lane, unimproved, seldom maintained loose surface roads intended for low density traffic with RMS values varying between 1.0 inches and 3.4 inches. Typically trails have no defined road width, large obstacles (rubble, boulder, logs, and stumps), cross ditches, washouts, steep slopes, and no bridging/culverts. Naturally occurring grades can vary from 0% up through 40%.

MOUT Terrain Discrete Event Description		
Discrete events	Description	Average Speed
Street curbs and obstacles	Obstacle avoidance over a six inch curb parallel to the path of the vehicle (over and back)	15
City debris	Climb over 2 ft high rubble pile	5
City obstacles	Negotiate randomly spaced fixed obstacles	10
Torsional Event	Drive across 12 in deep pot hole and 6 to 8 in half rounds	10
Ditch Slope/River Bank	Drive through V Ditch (45 degree approach angle)	5
Climb multiple vertical steps	Climb and descend 20 feet of 6 inch stairs	5

The MOUT cycle occurs, on average, once every other mission

Table 7 – MOUT Discrete Descriptions

Cross Country:

Cross country is terrain not subject to repeated traffic with RMS values varying between 1.5 inches and 4.8 inches. Cross-country terrain can consist of tank trails with crushed rock or having large exposed obstacles (rocks, boulders, etc), but there are no roads, routes, well-worn trails, or man-made improvements. This includes, but is not limited to, flat desert, marshes, vegetated plains, jungle, dense forest, mountains, and urban rubble. Naturally occurring grades can vary from 0% up through 60%.

Environmental Conditions

The JLTV is designed to be deployed world-wide and operate in all environmental conditions. Adversaries will continue to leverage the environment to achieve maximum advantage against JLTV forces. To defeat these enemies, JLTV units must be equipped to operate with tactical skills day and night under all weather, terrain, and climatic conditions. The JLTV forces are expected to operate in, or be exposed to, the climatic conditions of hot, basic, cold, and severe cold as defined in Army Regulations (AR) 70-38 [5] as depicted below:

Operating Temperature		
Climate	Operating Climate Temperature	% Use
Basic	-25°F to 110°F	85%
Hot	up to 130°F	10%
Cold	down to -50°F	3%
Severe Cold	down to -60°F	2%

[5] Army AR 70–38 - Research, Development, Test, And Evaluation Of Materiel For Extreme Climatic Conditions

Table 8 – Operating Temperature

Unique Environmental Requirements

The operating environment listed in Table 8 with their corresponding unique terrain conditions provide additional detail the JLTV will encounter during world wide combat operations.

Operating Environments			
MOUT	**Littoral Landing**	**Cold Climate**	**Mountainous Terrain**
Street curbs and obstacles	Fording	Ice	Cross Down Trees
City debris	Live Sand Dunes	Snow	Wash Outs
Wet pavement	Sand Wash		Cross Ditches
Torsional Event	Sand		Up to 60 % Grades
Climb over defensive obstacles	Mud		Climb over rocks obstacles
Ditch Slope/Crater/River Bank	Rice Paddy		
Climb multiple vertical steps			

Table 9 – Environmental/Terrain Breakdown

Support MRV Mileage Data

Two strategic Defense Planning Guidance compliant scenarios, both set in 2017, were used during the JLTV CAMEX Exercise. The following three tables depict the mileage for each mission role variant for MCO, IrW and Peace time annual usage.

Marine Corps and Army Joint Major Combat Operation (MCO) Scenario 72 Hours								
Operational Mode Summery (OMS)	**Mission Profiles (MP)**							
	Offense				Defense		Stability	Total
Full Spectrum Element MCO War Game Phases	Littoral/Air Assult	Movement to contact	Attack	Pursuit	Area Defense	Mobile Defense	Civil Security	
Distance (miles)	4.6	128.9	18.5	32.5	19.2	17.5	14.7	235.9
4 Seat CTV Category								
General Purpose	6.8	134.1	19.4	43.0	18.3	17.8	17.7	257.2
Heavy Gun Carrier	7.0	146.5	19.8	19.5	20.8	13.9	17.6	245.2
Close Combat Weapons Carrier	5.4	112.4	19.3	12.9	23.6	10.7	16.7	201.1
2 Seat CSV Category								
Shelter Carriers	0.0	144.6	14.9	60.7	12.8	28.8	14.0	275.8
CSV Utility	7.2	117.4	20.9	41.1	21.0	26.5	17.9	251.9

Table 10 – Supporting MCO Mission Role Mileage Detail

Marine Corps and Army Joint Irregular Warfare (IrW) Scenario 168 Hours							
Operational Mode Summery (OMS)	**Mission Profiles (MP)**						
	Stability			Defense		Offense	Total
Full Spectrum Element IrW War Game Phases	Civil Security	Restore Services	Support Government	Mobile Defense	Area Defense	Attack	
Distance (miles)	111.5	38.0	20.3	25.3	43.1	15.2	253.5
4 Seat CTV Category							
General Purpose	91.6	31.2	16.7	20.8	35.4	12.5	208.2
Heavy Gun Carrier	154.7	52.7	28.1	35.2	59.8	21.1	351.6
Close Combat Weapons Carrier	78.8	26.8	14.3	17.9	30.4	10.7	179.0
2 Seat CSV Category							
Shelter Carriers	79.1	27.0	14.4	18.0	30.6	10.8	179.8
CSV Utility	125.6	42.8	22.8	28.6	48.5	17.1	285.5

Table 11 – Supporting IrW Mission Role Mileage Detail

Marine Corps and Army Joint Peace Time			
Garrison Annual Usage	**Mission Profiles (MP)**		
	Peace Time		
	Garrison	Garrison Training	Garrison Total
Distance (miles)	500	1,000	1,500
4 Door CTV Category			
General Purpose	750	1,500	2,250
Heavy Gun Carrier	500	1,000	1,500
Close Combat Weapons Carrier	500	1,000	1,500
2 Door CSV Category			
Shelter Carriers	250	500	750
CSV Utility	750	1,500	2,250

Table 12 – Supporting Annual Mission Role Peacetime Mileage Detail

Acronyms

AO	Area of Operation
APOD	Aerial Port of Debarkation
CRSP	Central Receiving Shipping Point
FCC	Full Combat Configuration
MCO	Major Combat Operations
OMS/MP	Operational Mode Summary/ Mission Profile
POD	Port of Debarkation
SPOD	Sea Port of Debarkation

References

1. Field Manual No. 3-0, Operations
   Headquarters Department of the Army
   Washington, DC, FEBRUARY 2008

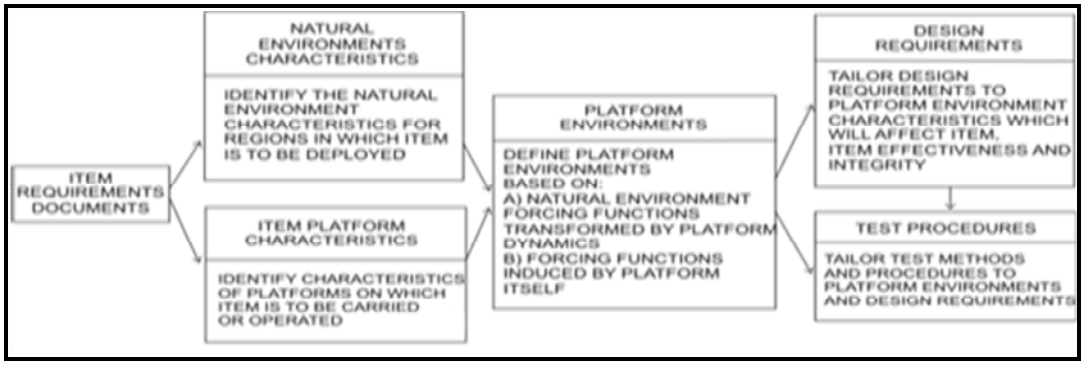
2. Field Manual No. 3-07, Stability Operations
   Headquarters Department of the Army
   Washington, DC, OCTOBER 2008

3. Nevada Automotive Test Center (NATC)
   - Terrain Profiling
   Carson City, Nevada
   http://www.natc-ht.com

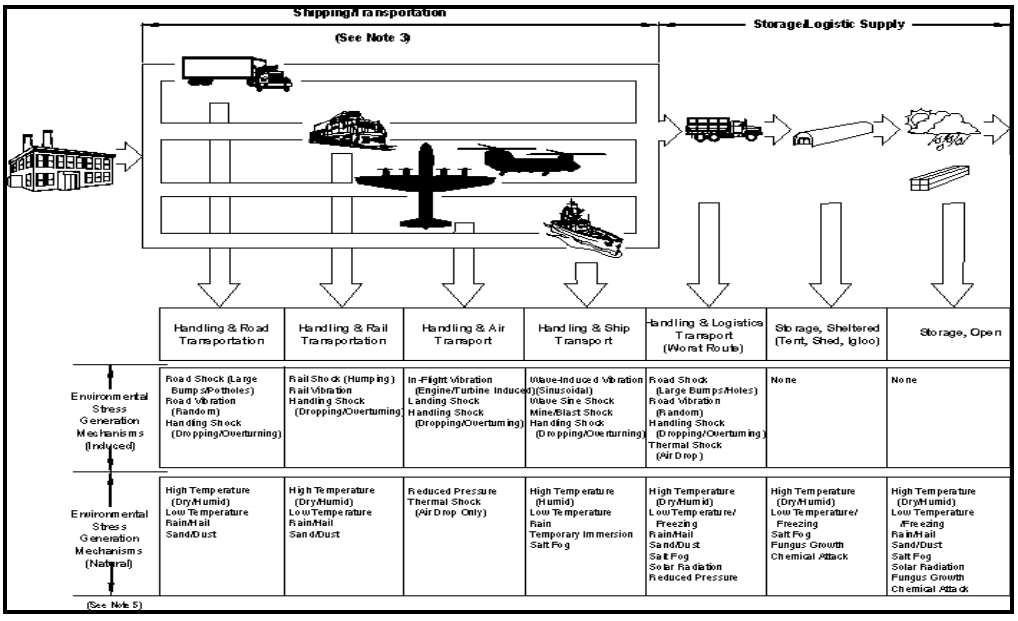
Appendix B: Planning for Environmental Conditions

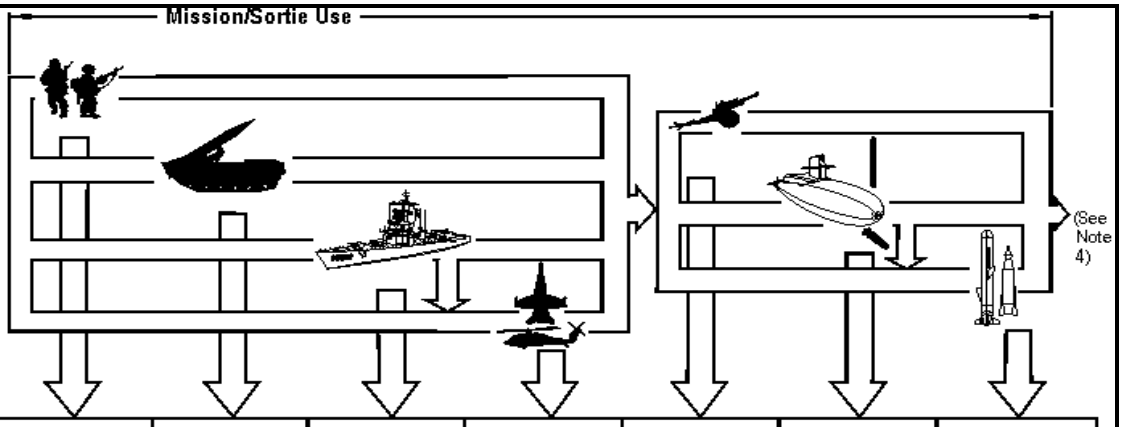
Development of capabilities for systems being designed for use in an operational environment require the consideration of all life cycle needs, including storage, transport, and operation in natural environments. Additionally, use in operationally based conditions requires a description of how performance in natural environmental conditions representative of the intended area of operations will be tested. The developer of a capabilities document should refer to the latest editions of MIL-STD 810, "Environmental Engineering Considerations and Laboratory Tests", and MIL HNDK 310, "Global Climatic Data for Developing Military Products", for further guidance on environmental design.

Design and testing/evaluation of the system are shown in the following environmental tailoring process and this generalized life cycle:



and generalized environmental profiles:





Deployment & Use by Foot Soldiers/Ground Personnel	Deployment & Use on Land Vehicles (Wheeled/Tracked)	Deployment & Use Aboard Ships	Deployment & Use on Aircraft Including Captive Stores (Fixed/Rotary Wing)	Delivery to Target Projectile	Delivery to Target Torpedo/Underwater Launched Missile	Delivery to Target Missile/Rocket
Handling Shock (Dropping/Slamming/ Overturning) Firing/Blast Shock Acoustic Noise Explosive Atmosphere Electromagnetic Interference	Road/Off-Road Vibration (Surface Irregularities/ Tread Laying) Engine-Induced Vibration Acoustic Noise Handling Shock (Including Bench) Road/Off-Road Shock (Large Bumps/Holes) Land Mine/Blast Shock Weapon Firing Shock/ Vibration Explosive Atmosphere Electromagnetic Interference	Wave Induced Vibration (Sinusoidal) Engine-Induced Vibration Acoustic Noise Wave-Slam Shock Mine/Blast Shock Weapon Firing Shock Explosive Atmosphere Electromagnetic Interference Increased Pressure (Submarine)	Runway-Induced Vibration Aerodynamic Turbulence (Random Vibration) Maneuver Buffet Vibration Gunfire Vibration Engine-Induced Vibration Acoustic Noise Take-Off/Landing/ Maneuver Acceleration Air Blast Shock Catapult Launch/ Arrested Landing Shock Handling Shock (Including Bench) Aerodynamic Heating Explosive Atmosphere Electromagnetic Interference	Firing Shock Firing Acceleration Handling/Loading Shock Acoustic Noise Aerodynamic Heating Explosive Atmosphere Electromagnetic Interference	Launch Acceleration Handling/Launch Shock Engine-Induced Vibration Acoustic Noise Pyrotechnic Shock (Booster Separation) Explosive Atmosphere Electromagnetic Interference	Launch/Maneuver Acceleration Handling/Launch Shock Engine-Induce Vibration Aerodynamic Turbulence (Random Vibration) Acoustic Noise Aerodynamic Heating Explosive Atmosphere Electromagnetic Interference
High Temperature (Dry/Humid) Low Temperature/ Freezing Thermal Shock (Storage to Use) Rain/Hail Sand/Dust/Mud Salt Fog Solar Radiation Fungus Growth Chemical Attack	High Temperature (Dry/Humid) Low Temperature/ Freezing Thermal Shock (Storage to Use) Rain/Hail Sand/Dust/Mud Salt Fog Solar Radiation Fungus Growth Chemical Attack	High Temperature (Dry/Humid) Low Temperature/ Freezing Thermal Shock (Storage to Use) Rain Salt Fog Solar Radiation Fungus Growth Chemical Attack	High Temperature (Dry/Humid) Low Temperature/ Freezing Thermal Shock (Storage to Use) Rain Salt Fog Solar Radiation Rain Impingement Sand/Dust Impingement Fungus Growth Chemical Attack	Thermal Shock (Storage to Use) Rain Impingement Sand/Dust Impingement	Immersion Thermal Shock	Rain Impingement Sand/Dust Impingement

Note 1:
The environmental stress events experienced by actual hardware may not always occur in the sequence shown in this profile. The generalized profile is intended to be used as a starting point for a tailored life cycle stress analysis and to provide confidence that all potentially significant environmental conditions have been considered.

Note 2:
The generalized profile provides only representative decision-making information. It does not impose or imply a specific test order although it can aid in suggesting potentially useful environmental test stress combinations or sequences.

Note 3:
Hardware may be subjected to any or all of the shipping/transportation modes shown. Therefore, in any life cycle stress analysis, evaluate the anticipated stresses experienced by the hardware in each mode and incorporate the most significant of these into the test program.

Note 4:
The generalized profile shows only areas of environmental concern and does not attempt to show operational use patterns. Consider the relative frequency and duration of storage, shipping, and mission events in determining life cycle environmental test parameters. Even one-shot devices (rockets, shells, etc.) must endure combinations and repetitions of all these events before they are ultimately fired.

Note 5:
In the interest of completeness, some environmental stress generating mechanisms have been included for which corresponding tests are not included in this document. Their absence from this document does not imply a lack of importance; they should be given equal consideration in the life cycle stress analysis.

Appendix C: Acronyms

Alert Time (AT)
Army Evaluation Center (AEC)
Army Logistics University (ALU)
Army Materiel Systems Analysis Agency (AMSAA)
Army Test and Evaulation Command (ATEC)
Army Training and Evaluation Programs (ARTEP)
Autonomous Mine Detection System (AMDS)
Calendar Time (CT)
Capabilities Development Document (CDD)
Capabilities Production Document (CPD)
Centers of Excellence (CoE)
Concept of Operations (CONOPS)
Crusader Self-Propelled Howitzer (SPH)
Equipment Usage Profile (EUP)
Ground Positioning System (GPS)
High Mobility Artillery Rocket System (HIMARS)
High Mobility Multipurpose Wheeled Vehicle (HMMWV)
Joint Capabilities Integration and Development System (JCIDS)
Joint Chemical Agent Detector (JCAD)
Key Performance Parameters (KPP)
Key System Attributes (KSA)
Manpower Estimate Report (MER)
Mine Resistant Ambush Protected (MRAP) Vehicles
Model and Simulation (M&S)
Near Eastern Affairs-Iraq (NEA-I)
Operational Mode Summary/Mission Profile (OMS/MP)
Operation Enduring Freedom (OEF)
Operation Iraqi Freedom (OIF)
Reliability, Availability and Maintainability (RAM)
Stryker Mobile Gun System (MGS)
Tactics, Techniques and Procedures (TTP)
Terminal High Altitude Area Defense (THAAD)
Test and Evaluation (T&E)
Total Army Analysis (TAA)
Total Operating Time (TOT)
Training and Doctrine Command (TRADOC)

Appendix D: Doctrinal References

Field manuals and selected joint publications are listed by new number followed by old number.

DEFINING PUBLICATIONS

FM 1-02 (101-5-1), *Operational Terms and Graphics (incl C1, 2 February 2010),* 21 September 2004.
JP 1-02, *Department of Defense Dictionary of Military and Associated Terms*, 15 August 2013.

JOINT AND DEPARTMENT OF DEFENSE PUBLICATIONS

Most joint publications are available online: http://www.dtic.mil/doctrine/.
CJCSI 5120.02C, *Joint Doctrine Development System,* 13 January 2012.
Manual for the Operation of the Joint Capabilities Integration and Development System, January 2012
DODD 5100.1, *Functions of the Department of Defense and Its Major Components, 2*1 December 2010.
JP 1, *Doctrine for the Armed Forces of the United States,* 25 March 2013.
JP 2-0, *Joint Intelligence,* 22 June 2007.
JP 2-01, *Joint and National Intelligence Support to Military Operations.* 5 January 2012.
JP 2-03, *Geospatial Intelligence Support to Joint Operations,* 31 October 2012.
JP 3-0, *Joint Operations*, 11 August 2011.
JP 3-05, *Special Operations,* 18 April 2011.
JP 3-06, *Joint Urban Operations,* 8 November 2009.
JP 3-07, *Stability Operations,* 29 September 2011.
JP 3-07.2, *Antiterrorism,* 24 November 2010.
JP 3-07.3, *Peace Operations*, 1 August 2012.
JP 3-07.4, *Joint Counterdrug Operations*, 14 August 2013.
JP 3-08, *Interorganizational Coordination During Joint Operations,* 24 June 2011.
JP 3-09, *Joint Fire Support,* 30 June 2010.
JP 3-10, *Joint Security Operations in Theater,* 3 February 2010.
JP 3-13, *Information Operations, 2*7 November 2012.
JP 3-13.1, *Electronic Warfare,* 8 February 2012.
JP 3-13.3, *Operations Security,* 4 January 2012.
JP 3-13.4, *Military Deception,* 26 January 2012.
JP 3-16, *Multinational Operations,* 16 July 2013.
JP 3-18, *Joint Forcible Entry Operations,* 27 November 2012.
JP 3-28, *Defense Support of Civil Authorities, 3*1 July 2013.
JP 3-33, *Joint Task Force Headquarters,* 30 July 2012.
JP 3-35, *Deployment and Redeployment Operations,* 31 January 2013.
JP 3-40, *Combating Weapons of Mass Destruction, 10* June 2009.
JP 3-41, *Chemical, Biological, Radiological, and Nuclear Consequence Management,* 21 June 2012
JP 3-50, *Personnel Recovery,* 20 December 2011.
JP 3-57, *Civil-Military Operations,* 11 September 2013.

JP 3-61, *Public Affairs,* 25 August 2010.
JP 3-68, *Noncombatant Evacuation Operations*, 23 December 2010.
JP 4-0, *Joint Logistic,* 18 July 2008.
JP 4-05, *Joint Mobilization Planning,* 22 March 2010.
JP 5-0, *Joint Operation Planning,* 11 August 2011.
JP 6-0, *Joint Communications System,* 10 June 2010.

ARMY PUBLICATIONS

Army regulations are produced only in electronic media. Most are available online: http://www.apd.army.mil/.

AR 10-87, *Army Command, Army Service Component Commands, and Direct Reporting Units,* 4 September 2007.
AR 12-1, *Security Assistance, Training, and Esport Policy,* 23 July 2010.
AR 34-1, *Multinational Force Compatibility,* 6 January 2004.
AR 350-1, *Army Training and Leader Development*, 18 December 2009 (RAR 001, 4 August 2011).
AR 360-1, *The Army Public Affairs Program,* 25 May 2011.
ADP 1, *The Army*, 17 September 2012 w/Chg 2 (6 August 2013)
ADP 2-0, *Intelligence,* 31 August 2012.
ADP 3-0, *Unified Land Operations,* 10 October 2011
FM 3-06, *Urban Operations,* 26 October 2006.
FM 3-07, *Stability Operations,* 6 October 2008 w/Chg 1.