Name of Principal Author and all other author(s):
Donna J. Simkins
Zbigniew M. Majchrzak

Principal Author’s Organization and address:
LMI
804 Omni Boulevard, Suite 103
Newport News, VA  23606

Phone: 757.591.8836 x 441267 or x 443032
Fax: 757.596.3627
Email: dsimkins@lmi.org or zmajchrzak@lmi.org

Original title on 712 A/B: Mobility Baseline Analysis

If the title was revised please list the original title above and the revised title here:

PRESENTED IN:

<table>
<thead>
<tr>
<th>WORKING GROUP:</th>
<th>18</th>
<th>DEMONSTRATION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMPOSITE GROUP:</td>
<td></td>
<td>POSTER:</td>
</tr>
<tr>
<td>SPECIAL SESSION 1:</td>
<td></td>
<td>TUTORIAL:</td>
</tr>
<tr>
<td>SPECIAL SESSION 2:</td>
<td></td>
<td>OTHER:</td>
</tr>
<tr>
<td>SPECIAL SESSION 3:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This presentation is believed to be: Unclassified, approved for public release, distribution unlimited, and is exempt from U.S. export licensing and other export approvals including the International Traffic in Arms Regulations (22CFR120 et seq.)
**Title:** Mobility Baseline Analysis

**Performing Organization:** LMI 804 Omni Boulevard, Suite 103 Newport News, VA 23606

**Supplementary Notes:** See also ADM202526. Military Operations Research Society Symposium (75th) Held in Annapolis, Maryland on June 12-14, 2007, The original document contains color images.
Agenda

- Background
- Security Environment in History and Vignettes
- Measuring Speed and Access
- Current Operational Construct
- Conclusion
Mobility Baseline Analysis

• Purpose
  – To reexamine Army deployment metrics established in the Baseline Deployment Study (BDS) – in light of the four security challenges described in the QDR
  – To inform the next Mobility Capabilities or Requirements Study

• Objective
  – To establish measures for speed and access in the delivery of the future force, its equipment, and sustainment in the emerging security environment

Analysis has roots in the Baseline Deployment Study

Metrics needed to shape programs:
- RDT&E
- Acquisition
- Improvements
Background

• Baseline Deployment Study (BDS)
  – Study organization
    • Directed by the Army G-3 and G-4
    • Led by Surface Deployment and Distribution Command Transportation Engineering Agency (TEA) and conducted by LMI
  – Three previous phases completed
    • Basis for current Army deployment metrics
    • Provided justification to support mobility enablers

• Mobility Baseline Analysis
  – Same study organization
  – Similar phased approach

Focused resources on the ability to conduct major combat operations in mature theaters

Potential to focus resources on the ability to conduct operations across the spectrum of possible force requirements

The focus is the difference
Analysis Approach

Questions

• What are the timelines for Army deployments in each of the security environment challenges – e.g., catastrophic, disruptive or irregular?
• Can the timelines be met with programmed (i.e., 2014) solutions? Or are there gaps that must be satisfied with 2024 technologies?

Three-Part Effort

1. Metrics review
   - History
   - Steady State Security Posture (SSSP) vignettes
   - Concepts and doctrine
2. Mobility Capabilities/Requirements Study preparation
3. Practical assessment of Army deployment metrics

Seemingly easy questions – now demand a more expansive approach
Deployment Metrics and the Analytic Agenda

- Operational framework established in Operational Availability (OA03) Study
- BDS Army deployment metrics
  - Nested within accepted operational construct
  - Required additional airlift, robust prepo, and RDT&E for high-speed sealift

Solid operational construct drove solid deployment metrics
Deployment Metrics for Joint Response

First Conflict

10/30/30

Joint Swiftness Objectives

The Army Must Be Able To Deploy and Employ...

- A Brigade Combat Team capability in 4 to 7 days
- A 3-Brigade capability in 10 days
- A 9-Brigade (Multi-Division) capability in 20 days
- A 15-Brigade (Multi-Division) capability in 30 days

- QDR01 basis for OA03
- OA03 basis for Joint Swiftness objectives and framework for Army metrics

...QDR 06 provided new strategic framework
The Security Environment
in History and Vignettes
### QDR 06 – New Security Environment

#### Irregular Challenges
Challenges from state and non-state actors employing methods such as terrorism and insurgency to counter our traditional military advantages, or engaging in criminal activity such as piracy and drug trafficking that threaten regional security.

#### Traditional Challenges
Challenges posed by states employing conventional armies, navies, and air forces in well-established forms of military competition.

#### Catastrophic Challenges
Challenges involving the acquisition, possession, and use of WMD by state and non-state actors; and deadly pandemics and other natural disasters that produce WMD-like effects.

#### Disruptive Challenges
Challenges from state and non-state actors who employ technologies and capabilities (such as biotechnology, cyber and space operations, or directed energy weapons) in new ways to counter military advantages the US currently enjoys.

---

Willingness to accept risk

Irregular and catastrophic challenges should be reflected in mobility metrics.
Operational Experience

Used TRANSCOM operations list as starting point for historical review…

…and added many more, occurring between 1990 and today, based on our research

Only 25% combat-related since 1989

Included: security challenge, mission, location, Service, type units, access issues, ISB use, COCOM supported, PREPO use, event timeline…

Examination of history for insights on non-traditional challenges
### Historical Operations by Year

**Disruptive (0/0)**

- No historical examples in disruptive quadrant

**Catastrophic (29/26)**

- 1991: Desert Focus
  - Hurricane Bertha
  - Hurricane Fran
- 1992: Provide Hope
  - Hurricane Andrew
  - Typhoon Omar
  - Hurricane Iniki
- 1994: LA Earthquake
  - JTF-LA
- 1995: Oklahoma City Bombing
- 1996: Desert Focus
  - Hurricane Bertha
  - Hurricane Fran
- 1997: ND Flood Relief
  - Typhoon Paka
- 1998: NE Ice Storms
  - Noble Response
  - Florida Wildfires
  - Hurricane Georges
  - Strong Support
  - Desert Fox
- 1999: Avid Response
- 2000: Fundamental Response
  - Atlas Response
- 2001: India Earthquake
  - Noble Eagle
- 2002: Avid Recovery
- 2005: Tiger Waves
  - Hurricane Katrina
  - Hurricane Rita
  - Operation Lifeline

**Irregular (55/31)**

- 1991: Eastern Exit
  - Provide Comfort
  - Quick Lift
  - Victor Square
- 1992: Ghost Zone
  - Garden Plot
  - Silver Anvil
  - Provide Promise
  - Provide Relief
  - Provide Transition
  - Restore Hope
- 1993: Able Manner
  - Deny Flight
  - Continue Hope
  - Able Sentry
  - Support Democracy
- 1994: Distant Runner
  - Support Hope
  - Able Vigil
  - Sea Signal
  - Safe Haven
  - Uphold Democracy
  - Distant Haven
- 1995: United Shield
  - Safe Passage
  - Prompt Return
  - Joint Endeavor
- 1996: Assured Response
  - Quick Response
  - Pacific Haven
  - Guardian Assistance
  - Operation Stabilize
- 1997: Assured Lift
  - Present Haven
  - Guardian Retrieval
  - Silver Wake
  - Noble Oblisk
  - Bevel Edge
- 1998: Shepherd Venture
  - Safe Departure
  - Autumn Shelter
  - Resolute Response
  - Infinite Reach
- 1999: Shining Hope
  - Noble Anvil
  - Joint Guardian
- 2000: Focus Relief
  - Determined Response
- 2001: Enduring Freedom
- 2002: Autumn Return
  - Shepherd Sentry
- 2003: Shining Express
- 2004: Secure Tomorrow
- 2006: CTF59
  - Strengthen Hope

**Traditional (12/11)**

- 1990: Desert Shield/Storm
- 1991: Patriot Defender
  - Desert Falcon
- 1992: Southern Watch
- 1994: Korean Nuclear Crisis
  - Vigilant Warrior
- 1995: Vigilant Sentinel
- 1996: Desert Strike
- 1997: Northern Watch
- 1998: Desert Thunder I
  - Desert Thunder II
- 2003: Iraqi Freedom

The past reflects the “new” strategy – consistent, concurrent ops in 3 quadrants
### Comparison of History and Future – By Mission

#### Historical Operations – 1991 to Present

<table>
<thead>
<tr>
<th>Irregular Missions:</th>
<th>Catastrophic Missions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD CT FHA MIO MC MSCA NEO PO Strike</td>
<td>NEO FP FHA MSCA NA Strike</td>
</tr>
<tr>
<td>Total – 55</td>
<td>Total – 29</td>
</tr>
<tr>
<td>Army – 31</td>
<td>Army – 26</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Traditional Missions:</th>
<th>Disruptive Missions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP MCO NA PO SoF Strike</td>
<td>C4ISR CD CP FHA HD IW NEO MIO MSCA SoF SSTR Deterrence SD&amp;C</td>
</tr>
<tr>
<td>Total – 12</td>
<td>Total – 39</td>
</tr>
<tr>
<td>Army – 11</td>
<td>Army – 35</td>
</tr>
</tbody>
</table>

#### SSSP Vignettes – representative of the future

<table>
<thead>
<tr>
<th>Irregular Missions:</th>
<th>Catastrophic Missions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAP C4ISR CD COIN CP CT EW FID HD IW MIO PO SIB/R SoF SD&amp;C UW</td>
<td>C4ISR CM CP Deterrence HD SD&amp;C</td>
</tr>
<tr>
<td>Total – 45</td>
<td>Total – 22</td>
</tr>
<tr>
<td>Army – 40</td>
<td>Army – 18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Traditional Missions:</th>
<th>Disruptive Missions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>C4ISR CD CP FHA HD IW NEO MIO MSCA SoF SSTR Deterrence SD&amp;C</td>
<td>C4ISR CP Deterrence HD SD&amp;C</td>
</tr>
<tr>
<td>Total – 39</td>
<td>Total – 17</td>
</tr>
<tr>
<td>Army – 35</td>
<td>Army – 14</td>
</tr>
</tbody>
</table>

- The mission does not define the quadrant – the environment does
- Potential to categorize a mission type in a number of quadrants

Mix of mission types across the security challenges
Security Environment – Past and Future

Historical Operations – 1991 to Present
- Irregular: 30%
- Catastrophic: 13%
- Traditional: 0%
- Disruptive: 14%

LMI Characterization of SSSP Vignettes
- Irregular: 26%
- Catastrophic: 14%
- Traditional: 3%
- Disruptive: 57%

- Percentages based on numbers of operations or vignettes – not duration, magnitude or frequency

Irregular challenges dominate – followed by catastrophic
**DoD Lead or Support**

- Heavy DoD lead in irregular quadrant is indicative of future focus on COIN and CT – not NEO or PO
- Historically heavy DoD support to DHS for MSCA and DoS for FHA missions in catastrophic challenge
- Mix of support versus lead may change as vignettes are combined in Integrated Security Posture sets

---

**Potential programmatic issues – if capability gaps are identified**

“Common to all of the focus areas is the imperative to work with other government agencies…and, where appropriate, to help them increase their capacities and capabilities and the ability to work together.” QDR 2006

“The Department must work hand in glove with other agencies to execute the National Security Strategy…Supporting and enabling other agencies, working toward common objectives, and building the capacity of partners…are indispensable elements of the Department’s new missions.” QDR 2006
Force Comparisons

Irregular Historical

- 22 of 31 operations required a force smaller than a brigade
- 8 of 31 operations had only non-combat forces – none brigade or larger

Irregular SSSP

- 26 of 38 operations require a force smaller than a brigade
- 13 of 38 operations have only non-combat forces – one brigade or larger

Catastrophic Historical

- 20 of 26 operations required a force smaller than a brigade
- 17 of 26 operations had only non-combat forces – two brigade or larger

Catastrophic SSSP

- 10 of 16 operations require a force smaller than a brigade
- 9 of 16 have only non-combat forces – one brigade or larger

BCT deployment metric offers questionable utility for these quadrants

"Combat" = elements of IBCT, SBCT or HBCT
Measuring Speed and Access
Nebulous References to Metrics

The capability to **deploy rapidly**, assemble, command, project, reconstitute, and re-employ joint combat power from all domains to facilitate **assured access**

**Force Planning Construct:**
- Continue to operate in and from forward areas
- Maintain capabilities and force to wage multiple campaigns in an overlapping time frame – for which there may be **little or no warning**

The future joint operational environment clearly places a rising premium on **speed** at every level of operations.

**Timely deployment** of the right forces to the right objective areas can preclude an enemy from setting defenses, diminish his maneuver options, and deny access to key terrain.

...**accelerate force flow**, reduce the enemy's ability to deny physical access to the theater, and increase the potential for operational surprise.

**Requirement for speed, access and responsiveness – but no metrics**
Need for Speed – Army

- Speed requirement based on interpretation of the environment and events preceding deployment – not orders process
- Driven largely by catastrophic acts of God or man

Requires more detailed examination – and a process to measure consequences
Access – Army

Access issue determination based on conditions during deployment – not those mitigated during planning

- Driven largely by physical limitations – e.g., damaged infrastructure, limited MOG, and congested ports

<table>
<thead>
<tr>
<th>Historical Operations</th>
<th>Access Problem?</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 Irregular</td>
<td>No</td>
</tr>
<tr>
<td>26 Catastrophic</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SSSP Vignettes</th>
<th>Access Problem?</th>
</tr>
</thead>
<tbody>
<tr>
<td>38 Irregular</td>
<td>No</td>
</tr>
<tr>
<td>16 Catastrophic</td>
<td>No</td>
</tr>
</tbody>
</table>

Also requires more detailed examination

identified by narrative accounts
limited discussion of consequences
Initial Response – Army

Historical Operations

- Initial response time measured from “trigger event” to first element deployed – not unit closure
- Where initial response was 7 days or less
  - Army forces in place or forward positioned in 23 of 24 operations
  - SOF, ACE, aviation, medical, water (i.e., not BCT) in 21 of 24 operations
  - Missions were primarily MSCA, FHA, NEO – not combat missions

BCT in 4 to 7 days for traditional operation – not the likely case
The Operational Construct

10/30/30
Operational End States for Challenges and Missions

Joint Pub 3.0

**SHAPE**
- Mobilization, Predeployment Activities, and Initial Deployment

**DETER**
- Deployment

**SEIZE INITIATIVE**
- Full Employment and Sequencing into the AO

**DOMINATE**
- Redeployment Operations May Begin

**STABILIZE**
- Redeployment Operations Complete

**ENABLE CIVIL AUTHORITY**
- Focus of current programmatic work

**10/30/30**
- Joint Swiftness Objectives

**Operational End-State**
- 30 days

**Hurricane Mitch**
- In Days
  - Provide relief
    - 26
  - Rehab infrastructure
    - 30
  - Rebuild infrastructure
    - 60

**Ghost Zone**
- Intel preparation
  - 51
- Close LOCs to traffickers
  - 44
- Sustain
  - 930

**SSSP FHA**
- Plan, assess, deploy
  - 3
- Execute
  - 30
- Transition
  - 14

**SSSP FID**
- Deter
  - 1080
- Dominate
  - 1080
- Stabilize
  - 720
- Transition
  - 720

Analytic Agenda must identify end-state measures
## 10/30/30 in Current Concepts

<table>
<thead>
<tr>
<th><strong>No</strong></th>
<th><strong>Yes</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Capstone Concept for Joint Operations</td>
<td>- Army Campaign Plan</td>
</tr>
<tr>
<td>- Joint Operating Concepts</td>
<td>- TRADOC Move Concept</td>
</tr>
<tr>
<td>- Joint Functional Concepts</td>
<td>- Retains focus on MCO</td>
</tr>
<tr>
<td>- Except Focused Logistics published in 2003</td>
<td>- Claims relevance to the range of military operations</td>
</tr>
<tr>
<td>- Joint Integrating Concepts</td>
<td></td>
</tr>
</tbody>
</table>

Joint Swiftness Objectives – in current Army, but not Joint concepts
Metrics and the Analytic Agenda

QDR 01
Swiftly Defeat the Effort / Win Decisive

BDS
OA 03
10/30/30
Operational Construct

OA 04
OA 05

MCS*
Sufficient Mobility Capability

Army Deployment Metrics

Surface Metrics

QDR 06

MCS Analysis

OA 06
OA 07

OA 08

MBA
Operational Construct??

No new operational construct since the publication of QDR, NSS and NDS...

Seminar wargame may only provide force construct

Need to measure mobility with operational metrics based in the Analytic Agenda

* Criticized by GAO because warfight and mobility metrics were not integrated

Operational end-states defined in terms of SDTE or WD may be less useful...in catastrophic events or irregular warfare
Conclusion
Issues, Observations and Way Ahead
Issues

• 10/30/30 questionable – and OA08 may not revalidate or revise

• Data
  – Difficult to collect comparable historical data
    • WMCCS to GCCS conversion in mid-90s
    • Different organizations keep different data – no single good source
    • Lessons learned reports missing or insufficient
  – Defense planning scenario development remains in progress
    • Missing deployment timelines, mode, concept of support

• Measures of consequence
  – History and SSSPs may be illustrative – but not predictive without a warfight, wargame result, model output or another measurement

Must be addressed in the way ahead
Observations

Metrics

• Needed to guide RDT&E and acquisition or improvement programs
• Must describe deployment speed and access in all quadrants
• Must be accepted throughout DoD and easily conveyed
• Should be documented in concepts and doctrine
• Cannot be determined solely by examining history
• Must be grounded in the Analytic Agenda

No drivers for a metric in any quadrant…
Observations

Current Operational Construct (10/30/30)

- Isn’t current
  - Not codified in doctrine/concepts – except Army
  - Created before the NSS, NDS and NMS
  - Does not represent non-traditional challenges – which are more predominant in history and future scenarios

- Isn’t right
  - Phase durations do not mesh
  - Does not consider
    - All mission types
    - DoD efforts in support of other Federal Agencies
    - Non-combat type forces
    - Force packages smaller than a BCT

New operational construct is required
Way Ahead

LMI / TEA Study Team

• Pursue data to continue historical review
• Participate in Army tiger teams and Joint forums to help establish appropriate operational framework or mobility measures
• Conduct “BDS-like” approach to metrics following OA and mobility study
How You Can Help

Our analysis to date points to many of the same issues you discussed in the Feb 06 MORS workshop – Analysis for Non-Traditional Security Challenges: Method and Tools – and supports your recommendations…

- Push for an updated operational construct (akin to 10/30/30) for all quadrants – that is developed in the OA series of studies
- Advocate an end-to-end mobility study (preferably a Mobility Requirements Study) following the next OA
- Encourage the JDS Library and DoD Components to collect and store historical operational data associated with deployments
- Support analytical study efforts intended to develop or refine metrics
- Identify – or promote the development of – models to measure consequences (e.g., is faster better, and why?)