

# 712CD

## 75<sup>TH</sup> MORSS CD Cover Page

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](mailto:dsimkins@lmi.org) or [zmajchrzak@lmi.org](mailto: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:**

<b>WORKING GROUP:</b>	18	<b>DEMONSTRATION:</b>	
<b>COMPOSITE GROUP:</b>		<b>POSTER:</b>	
<b>SPECIAL SESSION 1:</b>		<b>TUTORIAL:</b>	
<b>SPECIAL SESSION 2:</b>		<b>OTHER:</b>	
<b>SPECIAL SESSION 3:</b>			

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.)**

# Report Documentation Page

Form Approved  
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE <b>01 JUN 2007</b>		2. REPORT TYPE <b>N/A</b>		3. DATES COVERED <b>-</b>	
4. TITLE AND SUBTITLE <b>Mobility Baseline Analysis</b>				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>LMI 804 Omni Boulevard, Suite 103 Newport News, VA 23606</b>				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release, distribution unlimited</b>					
13. SUPPLEMENTARY NOTES <b>See also ADM202526. Military Operations Research Society Symposium (75th) Held in Annapolis, Maryland on June 12-14, 2007, The original document contains color images.</b>					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			

# Mobility Baseline Analysis



**75<sup>th</sup> Annual MORS Symposium**

**12 June 2007**

Donna J. Simkins  
Project Leader  
dsimkins@lmi.org  
757.591.8836 x 441267

**LMI**

GOVERNMENT CONSULTING

THE OPPORTUNITY TO MAKE A DIFFERENCE HAS NEVER BEEN GREATER

Zbigniew M. Majchrzak  
Research Fellow  
zmajchrzak@lmi.org  
757.591.8836 x 443032

# Agenda

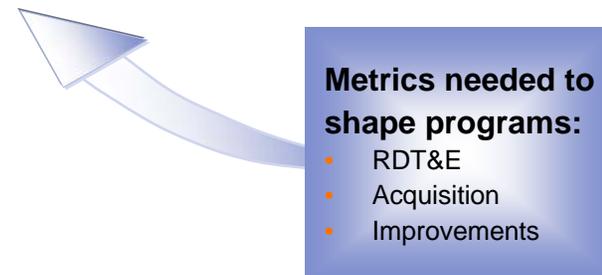
---

- 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



# 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*

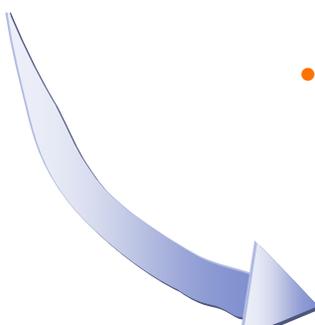
The focus is the difference



# 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

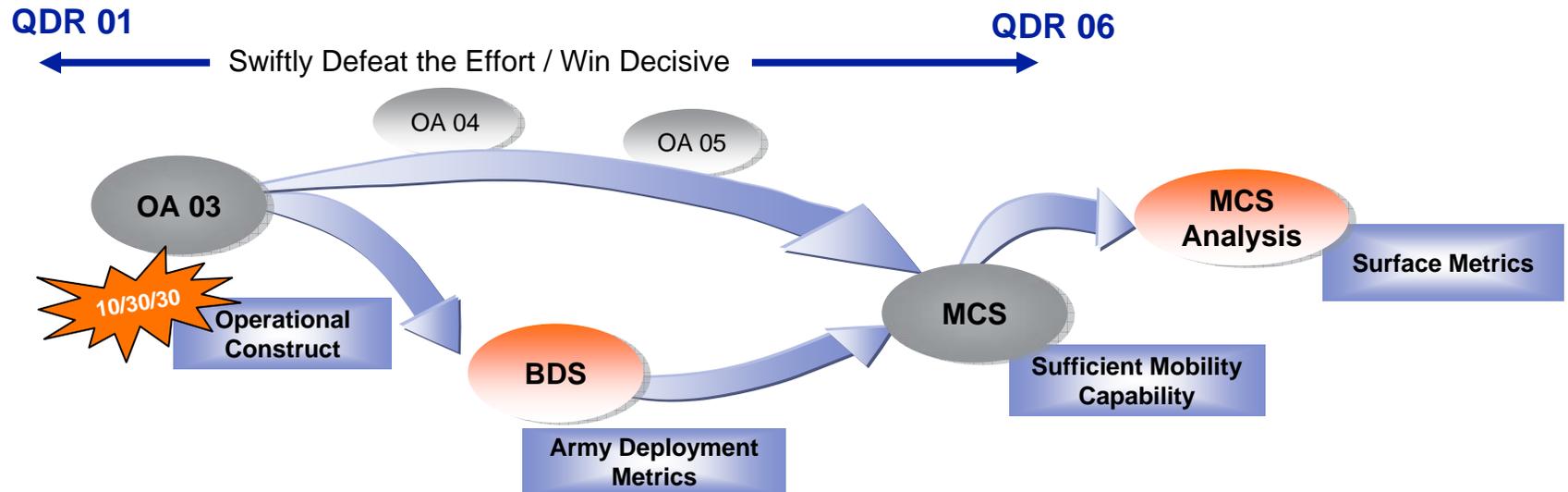


A strategic analysis addressing forces and enablers – must be based on DoD's Analytic Agenda

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

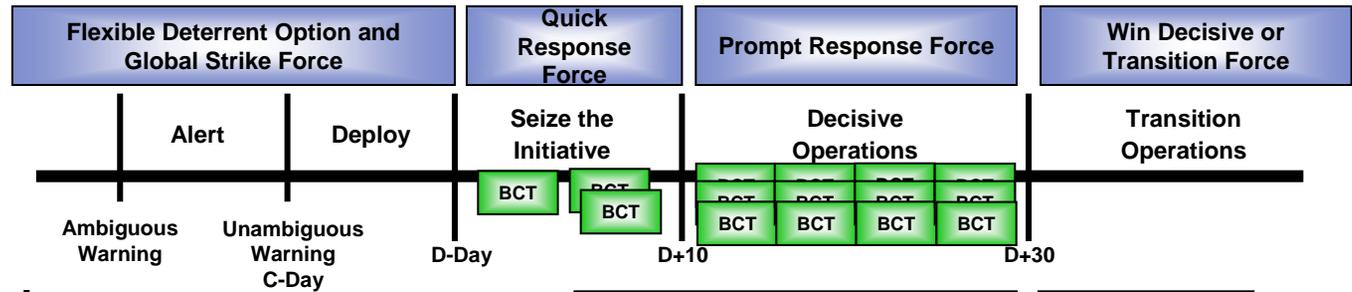
Solid operational construct drove solid deployment metrics



# Deployment Metrics for Joint Response



First Conflict

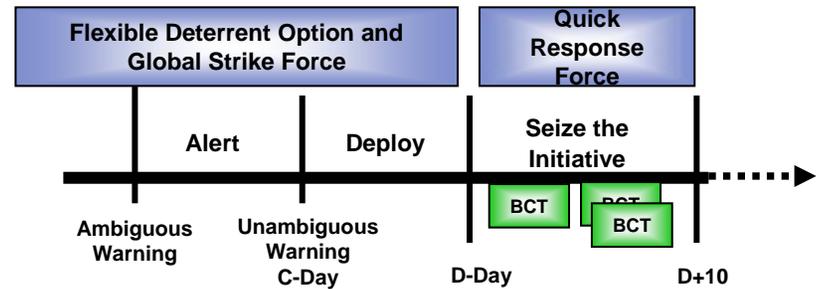


## Joint Swiftsness Objectives

**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

Second Conflict



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

...QDR 06 provided new strategic framework



---

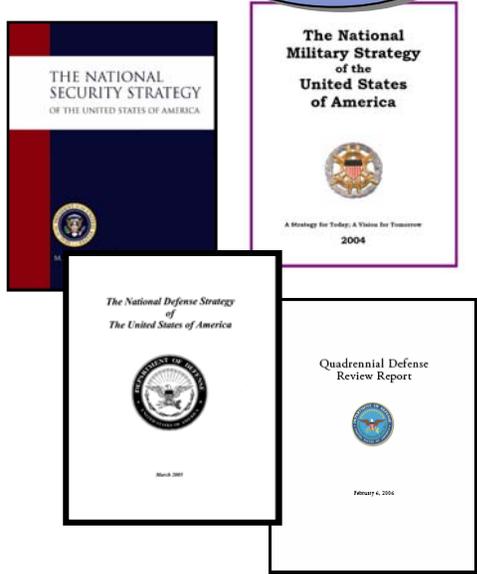
# The Security Environment

## in History and Vignettes



# QDR 06 – New Security Environment

DoD portfolio of capabilities shifting to address irregular, catastrophic and disruptive challenges



Willingness to accept risk

<p><b>Irregular Challenges</b></p> <p>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.</p>	<p><b>Catastrophic Challenges</b></p> <p>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.</p>
<p>Challenges posed by states employing conventional armies, navies, and air forces in well-established forms of military competition.</p> <p><b>Traditional Challenges</b></p>	<p>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.</p> <p><b>Disruptive Challenges</b></p>

“Not an imminent threat in the near- to mid-term”

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

- JUST CAUSE
- DESSERT SHIELD / DESSERT STORM
- Kurdish Relief
- Former Soviet Union Relief
- NORTHERN/SOUTHERN WATCH
- Hurricane Andrew/Iniki/Omar
- Somalia / Bosnia
- LA Earthquake
- Rwanda
- Oklahoma City
- Vigilant Sentinel
- JOINT ENDEAVOR
- Liberia NEO
- Dhahran Bombing
- Hurricane Bertha/Fran
- DESSERT STRIKE
- Kurdish Refugees
- Zaire/Rwanda
- ND Flood Relief
- Bevel Edge
- Typhoon Paka
- DESSERT THUNDER I
- N.E. Ice Storms
- DESSERT THUNDER II
- Florida Wildfires
- African Embassy Bombings
- Hurricane Georges
- DESSERT THUNDER III
- Hurricane Mitch
- DESSERT FOX
- Kosovo Ops
- East Timor
- Atlas Response
- Nigeria
- USS Cole
- India Earthquake
- NOBLE EAGLE
- ENDURING FREEDOM
- IRAQI FREEDOM
- Florida Hurricanes
- Asian Tsunami
- Hurricane Katrina
- Hurricane Rita
- Pakistan Earthquake

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

47 TRANSCOM Operations  
96 LMI-Reviewed Operations

Examination of history for insights on non-traditional challenges

# Historical Operations by Year

(Total operations / Army involvement)

<i>Irregular (55/31)</i>				<i>Catastrophic (29/26)</i>		
<u>1991</u> Eastern Exit Provide Comfort Quick Lift Victor Square	<u>1994</u> Distant Runner Support Hope Able Vigil Sea Signal Safe Haven Uphold Democracy Distant Haven	<u>1997</u> Assured Lift Present Haven Guardian Retrieval Silver Wake Noble Obelisk Bevel Edge	<u>2000</u> Focus Relief Determined Response <u>2001</u> Enduring Freedom <u>2002</u> Autumn Return Shepherd Sentry <u>2003</u> Shining Express <u>2004</u> Secure Tomorrow <u>2006</u> CTF59 Strengthen Hope	<u>1991</u> Sea Angel Fiery Vigil	<u>1996</u> Desert Focus Hurricane Bertha Hurricane Fran	<u>1999</u> Avid Response <u>2000</u> Fundamental Response Atlas Response <u>2001</u> India Earthquake Noble Eagle <u>2002</u> Avid Recovery <u>2005</u> Tiger Waves Hurricane Katrina Hurricane Rita Operation Lifeline
<u>1992</u> Ghost Zone Garden Plot Silver Anvil Provide Promise Provide Relief Provide Transition Restore Hope	<u>1995</u> United Shield Safe Passage Prompt Return Joint Endeavor	<u>1998</u> Shepherd Venture Safe Departure Autumn Shelter Resolute Response Infinite Reach		<u>1992</u> Provide Hope Hurricane Andrew Typhoon Omar Hurricane Iniki	<u>1997</u> ND Flood Relief Typhoon Paka	
<u>1993</u> Able Manner Deny Flight Continue Hope Able Sentry Support Democracy	<u>1996</u> Assured Response Quick Response Pacific Haven Guardian Assistance	<u>1999</u> Shining Hope Noble Anvil Joint Guardian Operation Stabilize		<u>1994</u> LA Earthquake JTF-LA	<u>1998</u> NE Ice Storms Noble Response Florida Wildfires Hurricane Georges Strong Support Desert Fox	
<u>1995</u> Able Sentry Support Democracy				<u>1995</u> Oklahoma City Bombing		
<i>Traditional (12/11)</i>				<i>Disruptive (0/0)</i>		
<u>1990</u> Desert Shield/Storm	<u>1991</u> Patriot Defender Desert Falcon	<u>1995</u> Vigilant Sentinel	<u>1996</u> Desert Strike	<div data-bbox="945 974 1386 1136" data-label="Text"> <p>Active Army heavy in traditional and irregular quadrants</p> </div> <div data-bbox="1050 1120 1533 1282" data-label="Text"> <p>National Guard heavy in catastrophic quadrant</p> </div> <div data-bbox="1533 1023 1953 1169" data-label="Text"> <p>No historical examples in disruptive quadrant</p> </div>		
<u>1992</u> Southern Watch	<u>1994</u> Korean Nuclear Crisis Vigilant Warrior	<u>1997</u> Northern Watch	<u>1998</u> Desert Thunder I Desert Thunder II			
		<u>2003</u> 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

<p><b><i>Irregular</i></b>  <u>Missions:</u>                  CD CT FHA MIO                  MC <b>MSCA</b> <b>NEO</b> PO                  Strike</p> <p>Total – 55                  Army – 31</p>	<p><b><i>Catastrophic</i></b>  <u>Missions:</u>  <b>NEO</b> FP FHA <b>MSCA</b>                  NA Strike</p> <p>Total – 29                  Army – 26</p>
<p><b><i>Traditional</i></b>  <u>Missions:</u>                  CP MCO NA PO SoF                  Strike</p> <p>Total – 12                  Army – 11</p>	<p><b><i>Disruptive</i></b></p>

## SSSP Vignettes – representative of the future

<p><b><i>Irregular</i></b>  <u>Missions:</u>                  CAP C4ISR CD COIN                  CP CT EW FID HD                  IW MIO PO SIB/R SoF                  SD&amp;C UW</p> <p>Total – 45                  Army – 40</p>	<p><b><i>Catastrophic</i></b>  <u>Missions:</u>                  C4ISR CM CP                  Deterrence HD SD&amp;C</p> <p>Total – 22                  Army – 18</p>
<p><b><i>Traditional</i></b>  <u>Missions:</u>                  C4ISR CD CP FHA                  HD IW <b>NEO</b> MIO  <b>MSCA</b> SoF SSTR                  Deterrence SD&amp;C</p> <p>Total – 39                  Army – 35</p>	<p><b><i>Disruptive</i></b>  <u>Missions:</u>                  C4ISR CP Deterrence                  HD SD&amp;C</p> <p>Total – 17                  Army – 14</p>

74 vignettes total – some appear in multiple challenges

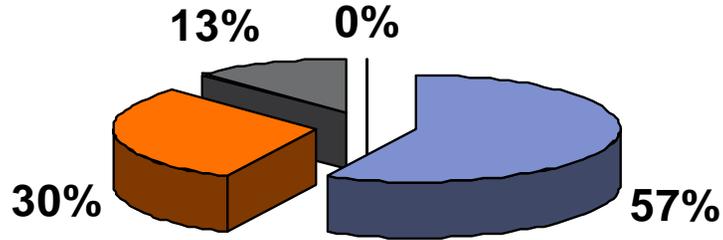
- The mission does not define the quadrant – the environment does
- Potential to categorize a mission type in a number of quadrants

Mix of mission types across the security challenges



# Security Environment – Past and Future

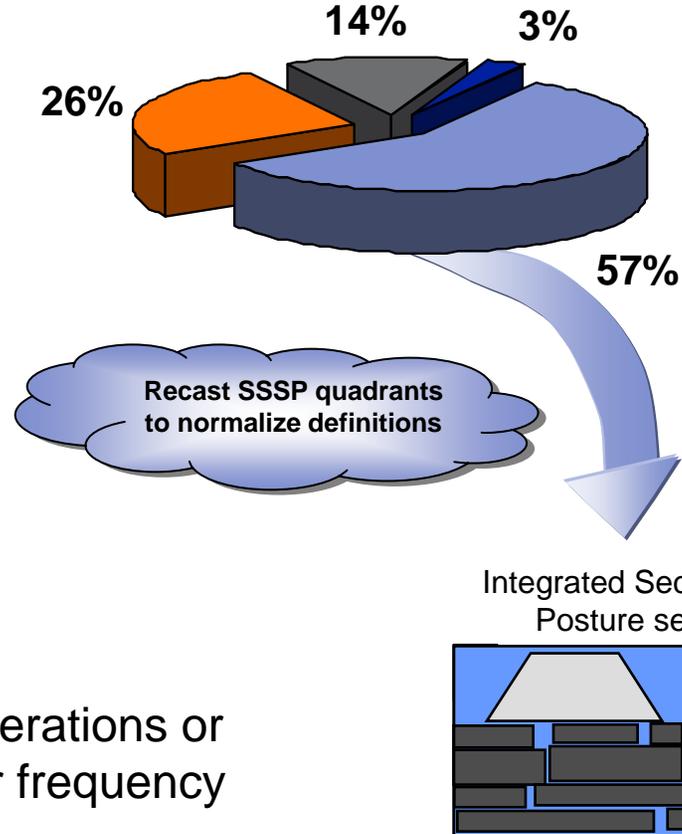
Historical Operations – 1991 to Present



- Irregular
- Catastrophic
- Traditional
- Disruptive

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

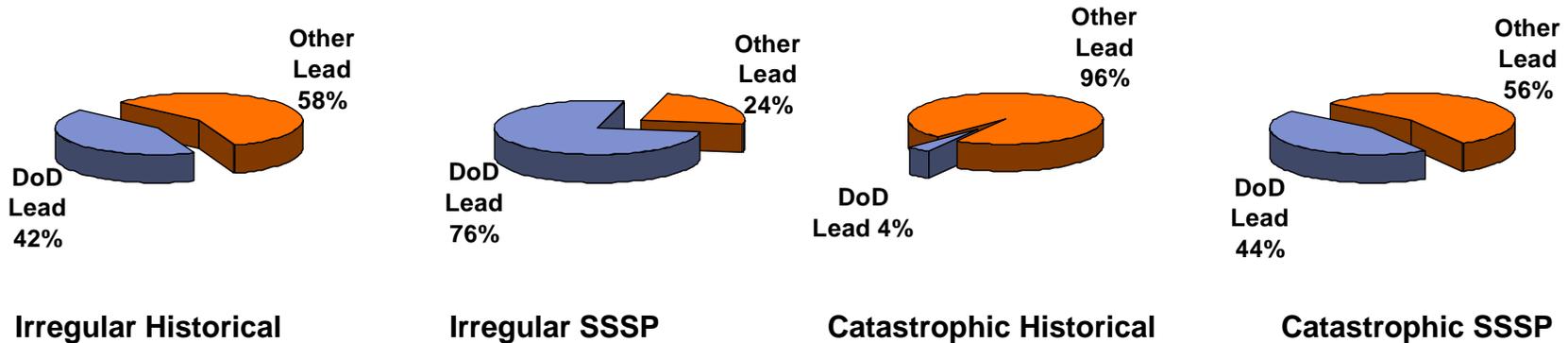
LMI Characterization of SSSP Vignettes



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

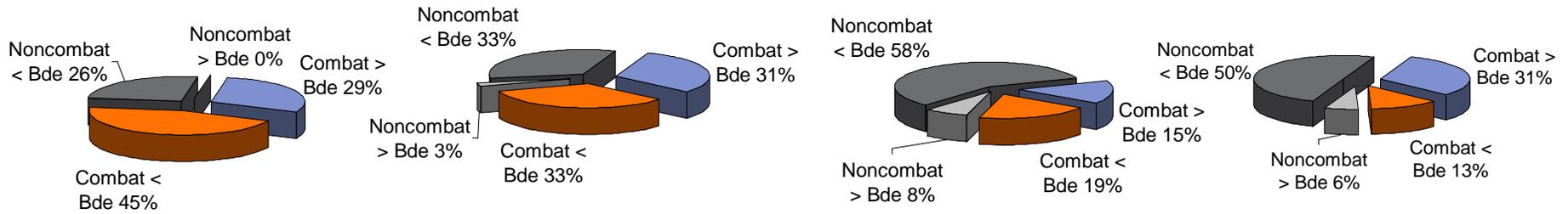
*“Common to all of the focus areas is the imperative to work with **other government agencies**...and, where appropriate, to help them **increase their capacities and capabilities** and the ability to work together.” QDR 2006*

*“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*

Potential programmatic issues – if capability gaps are identified



# Force Comparisons



## Irregular Historical

## Irregular SSSP

## Catastrophic Historical

## Catastrophic SSSP

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

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

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

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

No brigade-size force in 70% of all cases

No combat forces in 42% of all cases

“Combat” = elements of IBCT, SBCT or HBCT

BCT deployment metric offers questionable utility for these quadrants

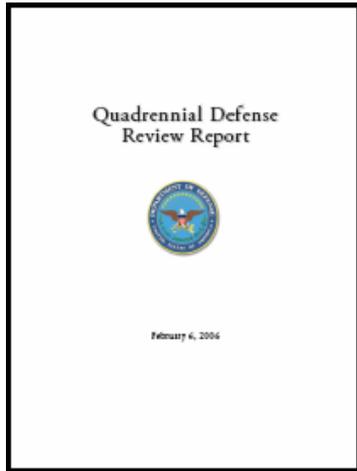


---

## 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:

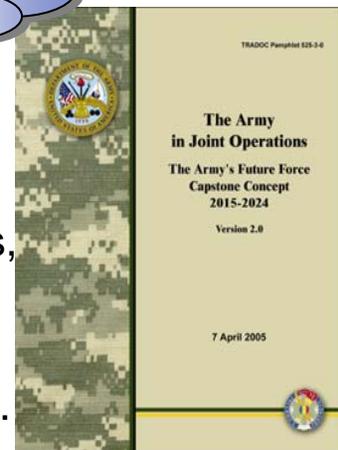
- Continue to operate in and from forward areas
- Maintain capabilities and force to wage multiple campaigns in an overlapping time frame – for which there may be **little or no warning**

Focus is on combat units

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

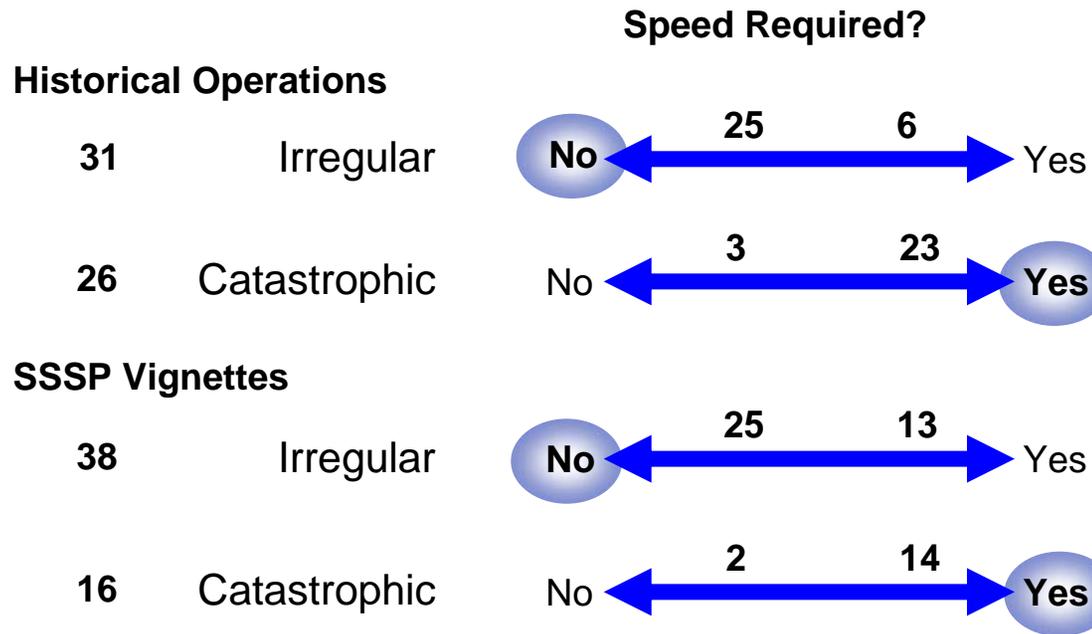
**Timely deployment** of the right forces to the right objective areas can preclude an enemy from setting defenses, diminish his maneuver options, and deny access to key terrain.

...**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



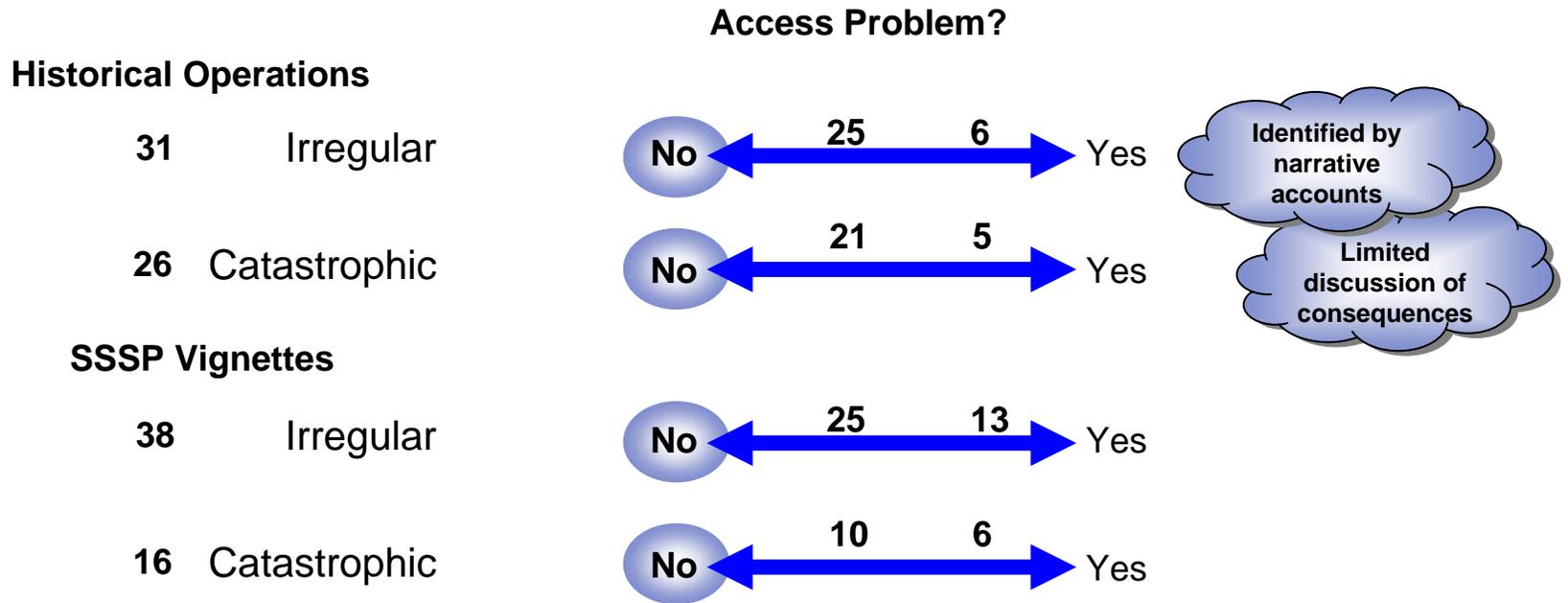
- Speed requirement based on interpretation of the environment and events preceding deployment – not orders process
- Driven largely by catastrophic acts of God or man



Requires more detailed examination – and a process to measure consequences



# Access – Army



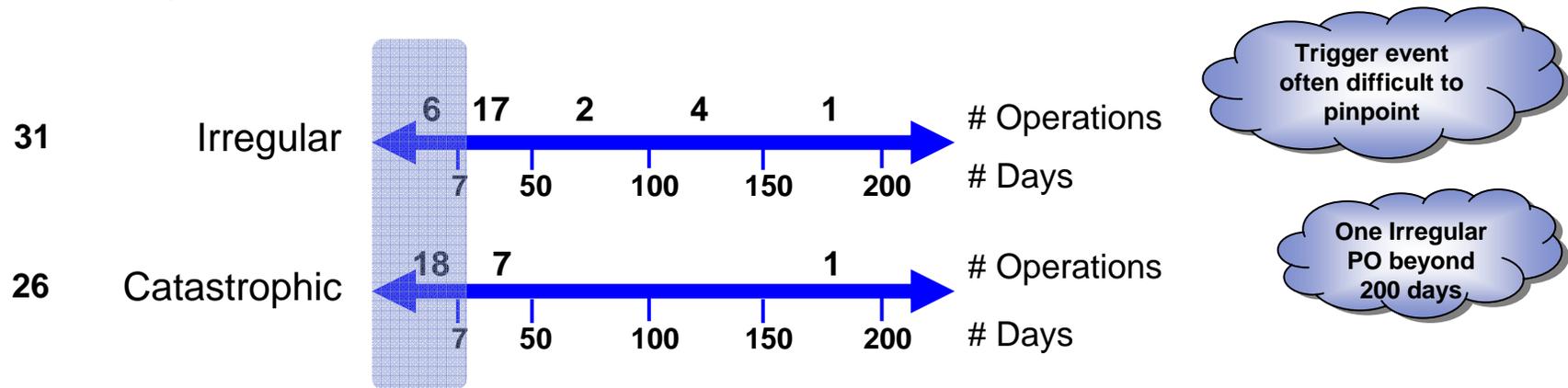
- Access issue determination based on conditions during deployment – not those mitigated during planning
- Driven largely by physical limitations – e.g., damaged infrastructure, limited MOG, and congested ports

Also requires more detailed examination



# 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



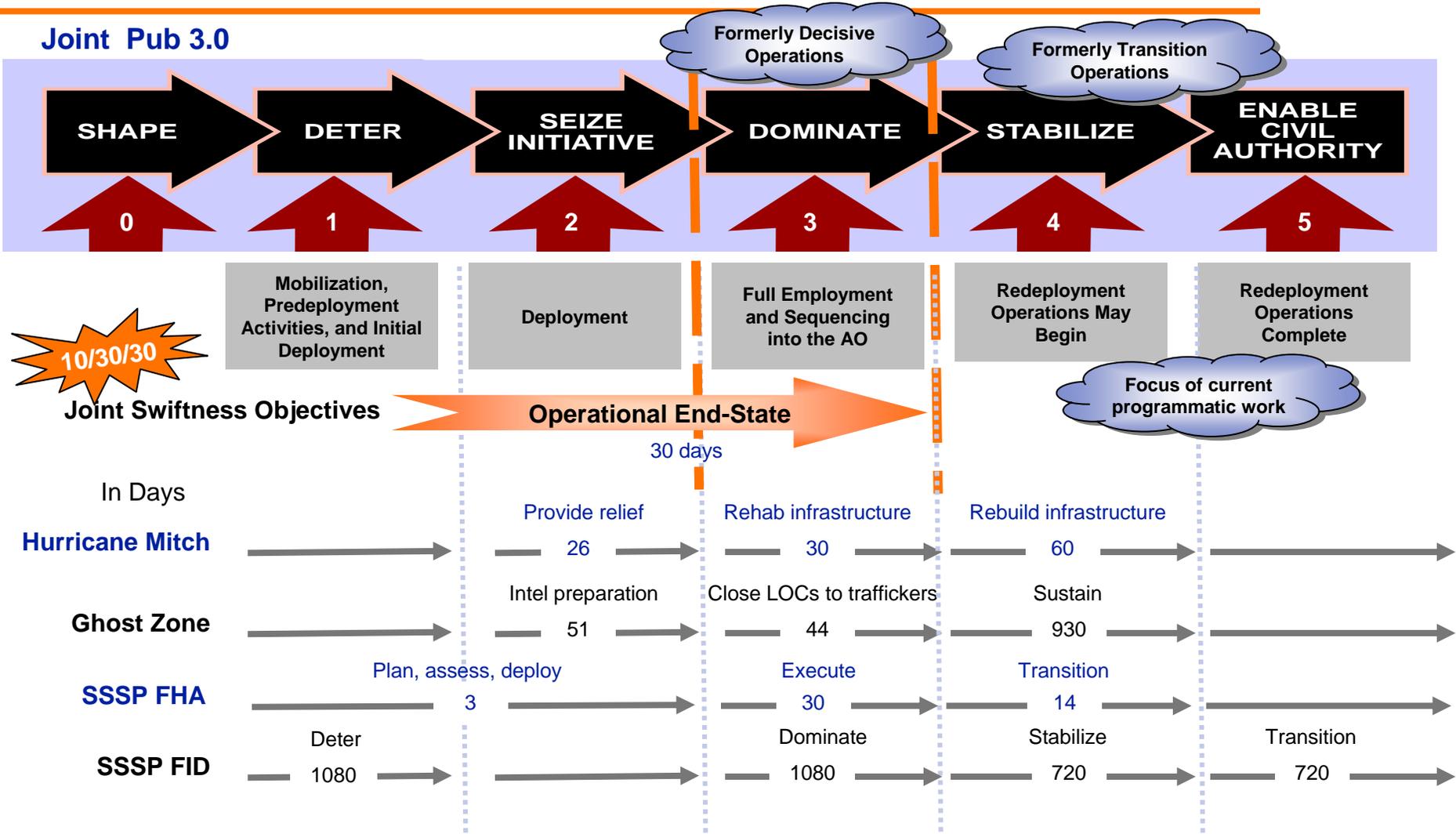
---

# The Operational Construct

10/30/30



# Operational End States for Challenges and Missions



Analytic Agenda must identify end-state measures

## 10/30/30 in Current Concepts

---

### No

- Capstone Concept for Joint Operations
- Joint Operating Concepts
- Joint Functional Concepts
  - Except Focused Logistics published in 2003
- Joint Integrating Concepts

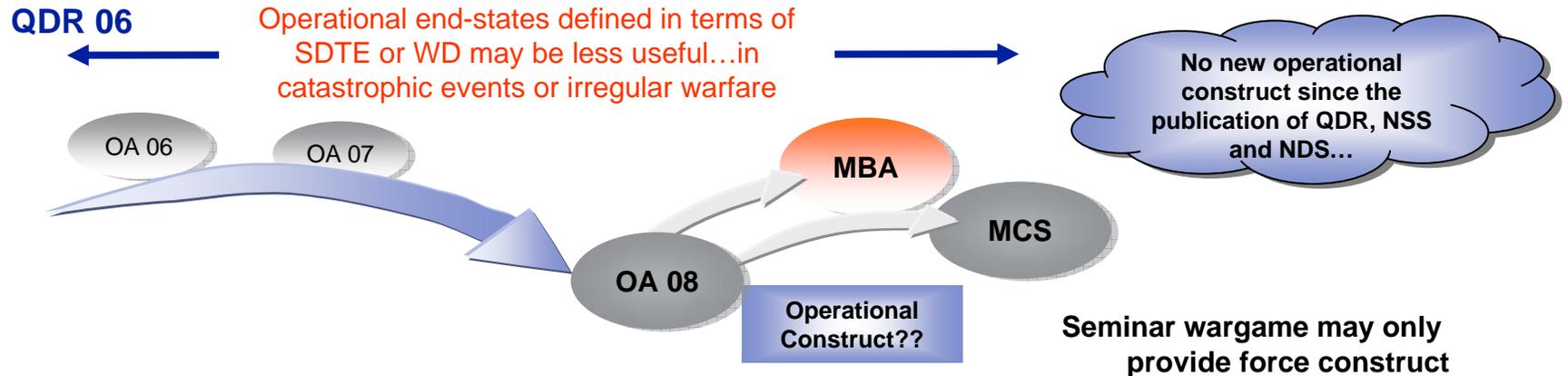
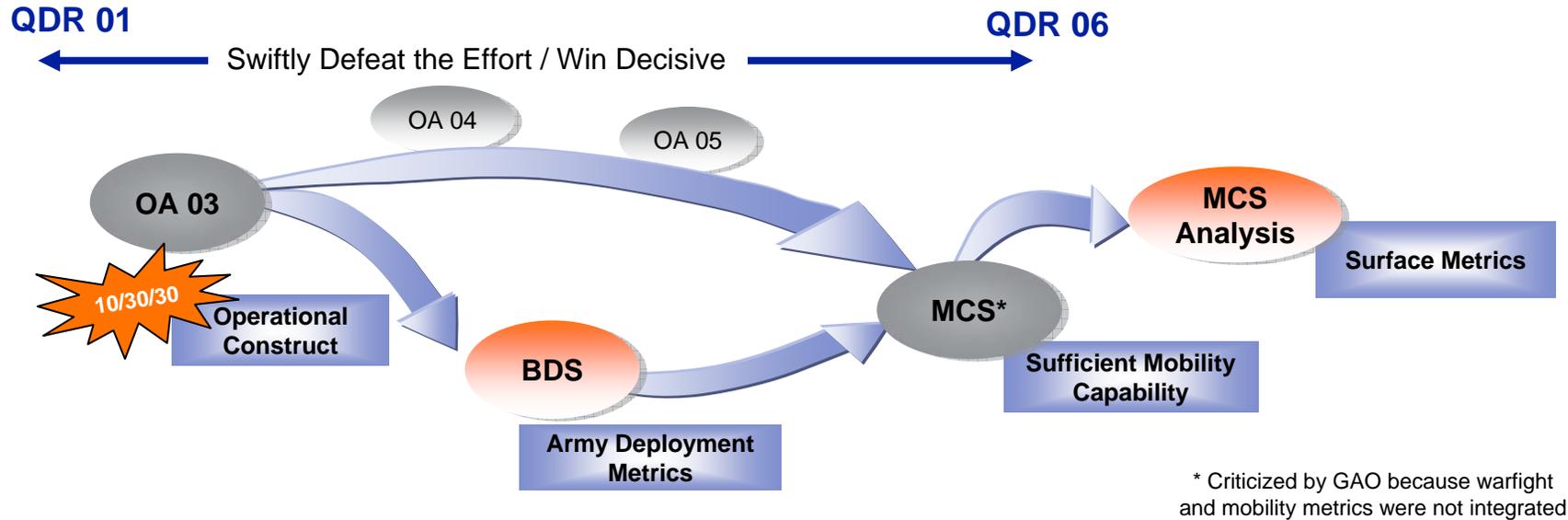
### Yes

- Army Campaign Plan
- TRADOC Move Concept
  - Retains focus on MCO
  - Claims relevance to the range of military operations

Joint Swiftiness Objectives – in current Army, but not Joint concepts



# Metrics and the Analytic Agenda



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





# 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

...and Army  
deployment metrics  
by association

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?)

