Future Deployment and Distribution Assessment (FDDA)

MORS Symposium

26 January 2011

Mr. Patrick McLeod, JDPAC Futures, 618-220-5238, patrick.mcleod@ustranscom.mil
**Title and Subtitle**

**Future Deployment and Distribution Assessment (FDDA)**

**Performing Organization**

U.S. Transportation Command, JDPAC Futures, Scott AFB, IL, 62225-5357

**Supplementary Notes**

2011 Force Structure Workshop, TASC Heritage Conference Center, Chantilly, VA, 24-27 January 2011
Agenda

• FDDA Background
• Phase 1 – Review
• Phase 2 – Assessment Procedure
• Insights
• FDDA Way Ahead
A perennial research and analysis effort intended to assess and catalog needed deployment and distribution capabilities and technologies of interest in the extended planning period and beyond (2017+)
FDDA integrates efforts to help shape the JDDE Future
FDDA Objectives

- Synthesize and vet future capability gaps in the Joint Deployment and Distribution Enterprise (JDDE)
- Identify S&T initiatives that may fill gaps or improve deployment and distribution capabilities – beyond the POM
- Evaluate the utility of the technologies in support of transforming forces and operational concepts
- Provide a forum and a process to shape S&T efforts and enhance JDDE capability
UNCLASSIFIED

Method

Perennial process

- Develop FDDA Baseline
- Synthesize and Assess Gaps
- Collect S&T Initiatives
- Select S&T Initiatives for Assessment
- Integrate Results
- Conduct S&T Assessment
- Report Results

- FDDA Terms of Reference
- Capabilities Gap Catalog
- Technology and Gap Catalog
- Assessment Procedure
- Insights Report
- FDDA SharePoint for Information and Collaboration

Phase 1
Phase 2
Phase 2 nearing completion now
UNCLASSIFIED

Shape and Inform

- **Community of Interest**
  - OSD
  - Joint Staff
  - Services
  - COCOMs
  - DLA

- **Engagement**
  - Panel Meetings
  - Terms of Reference – Jul 09
  - Updates to TCCC – Jul 09, May 10, Jan 11
  - Principals’ Updates – Apr 10 and Jan 11
  - Assessment Procedure – May 10
  - Briefings / Conferences

https://FDDAHome.lmi.org

- Includes calendar, library, blog, and announcements to keep stakeholders informed
- Is open to all – password protected – with levels of permission
- Allows industry, academia, etc. to submit S&T initiatives
- Provides means for collaboration with stakeholders

Continuing to engage the Community of Interest
Collect and Synthesize Capability Gaps

• Collected 120 capability gaps
• Collapsed to 60 gaps – eliminating duplicates and non-materiel solutions
• Convened Capability Gap Panel to review and rate synthesized gaps
• Deferred 37 capability gaps that did not require technology for resolution
• Prioritized remaining 23 gaps

Panel members provided valuable expertise – through a challenging process
Prioritized Capability Gaps

- Automated systems were top pick for USA, USAF, and USJFCOM – many solutions are working
- 6 of 7 austere access / speed capability gaps in top 10
- “Rogue” MVM gap ranked highly
- All Seabasing gaps ranked highly by USA and DLA
- Packaging gap important to DLA and USTRANSCOM

Address all – but focus on austere access, MVM, and Seabasing
Collect and Map S&T Initiatives

Start

Developed JDDE technology interest areas

Interest Areas
Multi-functional cargo platforms
Speed, precision, and access enablers
Automated technologies
Alternative energy sources

Collected and prioritized capability gaps

Populated interest areas with capability needs

Announced interest areas to industry, academia, and government

Binned gaps by Themes

Themes
- Austere Access/Speed
- CBRNE
- Demand Reduction
- Automated Technologies
- Infrastructure
- Mounted Vertical Maneuver
- Packaging
- Predictive Logistics
- Seabasing

Collected technologies

Mapped technologies to Themes

29 responses in technology interest areas
- 16 – platforms
- 8 – enablers
- 4 – automated technology
- 1 – alternative fuels

Limited offerings in:
- CBRNE
- Demand Reduction
- Infrastructure
- Packaging
- Predictive Logistics

Good response for initial effort
Select Technologies for Assessment

Convened S&T panel

- Reviewed 29 offerings
- Provided leads on additional technologies
- Credited S&T initiatives – establishing the list of technologies for assessment

S&T Panel Members
OSD DDR&E
OSD Trans Policy
USA ARCIC
USMC MCCDC
USAF A5XC and A8XC
USNORTHCOM J47
USPACOM J42
USTRANSCOM J5/4
AMC A8XC and ST
MSC N74
SDDC ST
DLA DDC
AFMC AFRL / RBOT

Crediting Plan

- Objective 1: Relevance of the proposed technology or initiative to the JDDE
  - Proposal addresses the most critical capability gaps in the JDDE
  - Proposal offers leap-ahead technology
  - Proposal offers a capability that does not readily exist
- Objective 2: Applicability of the technology or initiative to the JDDE S&T interest areas
  - Proposal applies to the JDDE S&T interest area(s)
  - Proposal includes measurable goals for the S&T interest areas or is otherwise relevant to the JDDE mission needs
- Objective 3: Technical merits of the candidate technology
  - Proposal is technically feasible (i.e., approach is appropriate and success seems likely)
  - Proposal has technical merit
  - Quality of the proposal
- Objective 4: Cost and cost realism
  - Potential for Return on Investment

Great expertise represented in this panel – very helpful
## Technologies Selected for Assessment

<table>
<thead>
<tr>
<th>Technology Name</th>
<th>Technology Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blended Wing Body (BWB) Energy Efficient Transport</td>
<td>Air platform CTOL</td>
</tr>
<tr>
<td>A400M</td>
<td>Air platform CTOL</td>
</tr>
<tr>
<td>Advanced Tactical Transport Technology (AT3)</td>
<td>Air platform STOL</td>
</tr>
<tr>
<td>C-17 FE</td>
<td>Air platform STOL</td>
</tr>
<tr>
<td>Advanced Pulsejet (APJ) VTOL Aircraft</td>
<td>Air platform VTOL</td>
</tr>
<tr>
<td>Modular Unmanned VTOL Resource (MUVR)</td>
<td>Air platform VTOL UAS</td>
</tr>
<tr>
<td>Mono Tiltrotor (MTR)</td>
<td>Air platform VTOL UAS</td>
</tr>
<tr>
<td>Optimum Speed Tiltrotor (OST)</td>
<td>Air platform VTOL</td>
</tr>
<tr>
<td>Aeroscraft Cargo Platform Air Vehicle</td>
<td>Airship</td>
</tr>
<tr>
<td>Hybrid Thermal Airship (HTA)</td>
<td>Airship</td>
</tr>
<tr>
<td>Lockheed Martin (LM) Hybrid Aircraft</td>
<td>Airship</td>
</tr>
<tr>
<td>Surface Effect Flying Vehicle (SEFV)</td>
<td>Air/surface platform</td>
</tr>
<tr>
<td>Sea Train</td>
<td>Surface platform</td>
</tr>
<tr>
<td>Dual Use Trimaran</td>
<td>Surface platform</td>
</tr>
<tr>
<td>Heavy Air Lift Support Ship (HALSS)</td>
<td>Surface platform</td>
</tr>
</tbody>
</table>

15 of 29 proposals accepted for assessment
### Identified Technologies with Potential Impact

<table>
<thead>
<tr>
<th>Technology Name</th>
<th>Technology Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Landing Gear for Improvised Landing Zones</td>
<td>Air enabler</td>
</tr>
<tr>
<td>Automated Aerial Refueling</td>
<td>Air enabler</td>
</tr>
<tr>
<td>Autonomous Approach and Landing</td>
<td>Air enabler</td>
</tr>
<tr>
<td>Helicopter Sling Load for Joint Precision Airdrop System (JPADS)</td>
<td>Air enabler</td>
</tr>
<tr>
<td>Next Generation JPADS Guidance, Navigation, &amp; Control</td>
<td>Air enabler</td>
</tr>
<tr>
<td>Opportune Landing Site (OLS) Detection</td>
<td>Air enabler</td>
</tr>
<tr>
<td>Joint Cargo Unmanned Aircraft System Slingload</td>
<td>Air platform</td>
</tr>
<tr>
<td>Unmanned Air-Launched Cargo Glider; Autonomous Navigating Glider Logistics System (ANGLS)</td>
<td>Air platform</td>
</tr>
<tr>
<td>Container At Sea Transfer System/Large Vessel Interface Lift On/Lift Off (LVI Lo/Lo)</td>
<td>Surface enabler</td>
</tr>
<tr>
<td>Enhanced Air Skid Shipboard Testing/Shipboard Selective Access &amp; Retrieval System (SSARS)</td>
<td>Surface enabler</td>
</tr>
<tr>
<td>Joint Enabled Theater Access-Sea Ports of Debarkation (JETA-SPOD)</td>
<td>Surface enabler</td>
</tr>
<tr>
<td>Joint Universal Causeway Interface Module (JUCIM)</td>
<td>Surface enabler</td>
</tr>
<tr>
<td>Joint Recovery and Distribution System (JRaDS)</td>
<td>Surface platform</td>
</tr>
<tr>
<td>Vertical Armored Seabase Assault and Support Ship (VASAS)</td>
<td>Surface platform</td>
</tr>
</tbody>
</table>

*These will be considered in our assessment – as appropriate*
### Lebanon – Uncertain Environment (Cases 1-5)

<table>
<thead>
<tr>
<th>Case</th>
<th>Action</th>
<th>Force</th>
<th>Type Operation</th>
<th>Access</th>
<th>Leg</th>
<th>Technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3</td>
<td>Deploy and sustain forces</td>
<td>CAB, IBCT</td>
<td>Peace Enforcement</td>
<td>No airports initially; one small seaport</td>
<td>ISB to PON</td>
<td>Airship</td>
</tr>
<tr>
<td>2-5</td>
<td>Deploy and sustain forces ashore from the sea base</td>
<td>MEU, IBCT</td>
<td>Secure WMD</td>
<td>No airports; one small seaport</td>
<td>Sea base to PON</td>
<td>VTOL, UAV, Airship</td>
</tr>
<tr>
<td>4</td>
<td>Deploy and sustain forces</td>
<td>SBCT, MEB</td>
<td>Peace Enforcement</td>
<td>Airport available; seaport degraded</td>
<td>Forward location to PON</td>
<td>Surface</td>
</tr>
</tbody>
</table>

**Legend:**
- MEU
- IBCT (ABN)
- MEB
- SBCT
- Airport
- Seaport

**Notes:**
- ISB: Intermediate Staging Base
- PON: Primary Operating Base
- VTOL: Vertical Take-Off and Landing
- UAV: Unmanned Aerial Vehicle
- Airship
- Surface
Sudan – Uncertain Environment (Cases 6-9)

Themes: Access/Speed and Mounted Vertical Maneuver

<table>
<thead>
<tr>
<th>Case</th>
<th>Action</th>
<th>Type Operation</th>
<th>Force</th>
<th>Access</th>
<th>Leg</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Deploy forces</td>
<td>Foreign Humanitarian Assistance</td>
<td>IBCT</td>
<td>Major airport available</td>
<td>CONUS to PON</td>
<td>C/STOL, VTOL, Airship</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sust Bde</td>
<td></td>
<td></td>
<td>Seaport to PON</td>
<td>VTOL, Airship</td>
</tr>
<tr>
<td>7</td>
<td>Sustain forces and provide humanitarian assistance</td>
<td>Foreign Humanitarian Assistance</td>
<td>IBCT</td>
<td>Two airports and one seaport available</td>
<td>CONUS to PON</td>
<td>Airship</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MEU Refugees</td>
<td></td>
<td></td>
<td>Air and seaport to PON</td>
<td>C/STOL, VTOL, UAS, Airship</td>
</tr>
<tr>
<td>8</td>
<td>Deploy forces</td>
<td>Security Cooperation</td>
<td>SBCT</td>
<td>Airport available</td>
<td>CONUS to PON</td>
<td>Airship</td>
</tr>
<tr>
<td>9</td>
<td>Maneuver and sustain forces</td>
<td>Recovery of Sensitive Item</td>
<td>SBCT</td>
<td>Airfield available</td>
<td>Airfield to PON</td>
<td>C/STOL, VTOL, Airship</td>
</tr>
</tbody>
</table>

Access challenged by limited in-country infrastructure

And a MVM excursion
Baseline Panel

Approached Baseline Panel with themes, baseline assumptions, and potential assessment vignettes

- Determined that unclassified vignettes – loosely based on the DPS and representative of the QDR – were sufficient
- Reviewed and validated assumptions
- Selected two locations

Baseline Panel Members

- OSD CAPE
- OSD NA
- OSD Policy
- USA ARIC
- USN N42
- USMC HQMC and MCCDC
- USEUCOM J4
- USJFCOM J38 and J59
- USPACOM J4
- USSOUTHCOM ES
- USTRANSCOM J5/4
- JS J4
- AMC A8 and A9
- DLA J31
- AMRDEC AATD

Members provided a unique blend of experience and insights
1. Research
   - Are there technologies for under-represented themes?

2. Qualitative assessment – Initial
   - Is it in the program of record?
   - What is the concept of employment?
   - How does it satisfy future operational concepts?
   - What other efforts are examining this?
   - Does it have technical/scientific merit?

3. Quantitative assessment
   - Does the technology improve or reduce force closure time, sustainment delivery time, and / or exposure to hostile threats? By how much?

4. Qualitative assessment – Final
   - What is the anticipated return on investment?
   - Does the technology decrease the complexity of deployment / distribution?
   - What are the human aspects of employment?
   - How will it deploy to the operational area?
   - What operational circumstances make one technology preferable to another?
Tools and Model Set Up

- **Legacy Lift Assets**
  - Numbers based on Service projections and CAPE input

- **Future Lift Platforms**
  - Numbers based on capacity to carry similar payloads

- **Cost elements for legacy and future platforms**
  - Fuel, crew, parts, and maintenance – provided by Services and vendors and adjusted by assessment team

<table>
<thead>
<tr>
<th>Tools Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Joint Flow and Analysis System for Transportation (JFAST)</td>
</tr>
<tr>
<td>• Enhanced Logistics Intra-theater Support Tools (ELIST)</td>
</tr>
<tr>
<td>• Transportability Analysis Report Generator (TARGET)</td>
</tr>
<tr>
<td>• Airfield Suitability and Restrictions Report (ASRR)</td>
</tr>
<tr>
<td>• Opportune Landing Sight : Multi-Spectral (OLS-MS)</td>
</tr>
<tr>
<td>• Excel (Quantitative Analysis) Tools</td>
</tr>
</tbody>
</table>
Measuring sustainment rate, truck use, cost efficiency and fuel efficiency – as well as force closure – in the quantitative assessment
The FDDA community of interest is positive about FDDA

Many complementary efforts are ongoing but information is compartmentalized

Concepts (e.g., Seabasing, MVM) are amorphous targets and not universally recognized

Future capability gap collection is a challenge

S&T solicitation in future iterations should go to a wider audience – beyond the RFI

Some technologies are in conceptual stage and are difficult to model

Phase 1 Insights Report published in June 2010 – Phase 2 Report in progress now
FDDA Way Ahead

• Integration Plan
  – Codify FDDA as JDDE Future Concept Assessment Methodology
    • Brief to Log FCB (10 Feb), Log JCB (late Feb) and JROC (mid-Mar)
    • Output: Joint Requirements Oversight Council Memo (JROCM)
  – Apply Results / Insert into Other Analysis and S&T Efforts

• FDDA Next
  – Guided by Community of Interest Collaboration and Feedback
  – Synchronized to Other Mobility Analysis and Strategic Guidance
  – Estimated Start in 3Qtr FY11
Questions?