Presented to:

RAM Conference

Logistics Engineering Laboratory

AMRDEC

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

Date: November 2015

Presented by:

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Logistics Engineering Group

U.S. Army Aviation and Missile Research, Development, and Engineering Center

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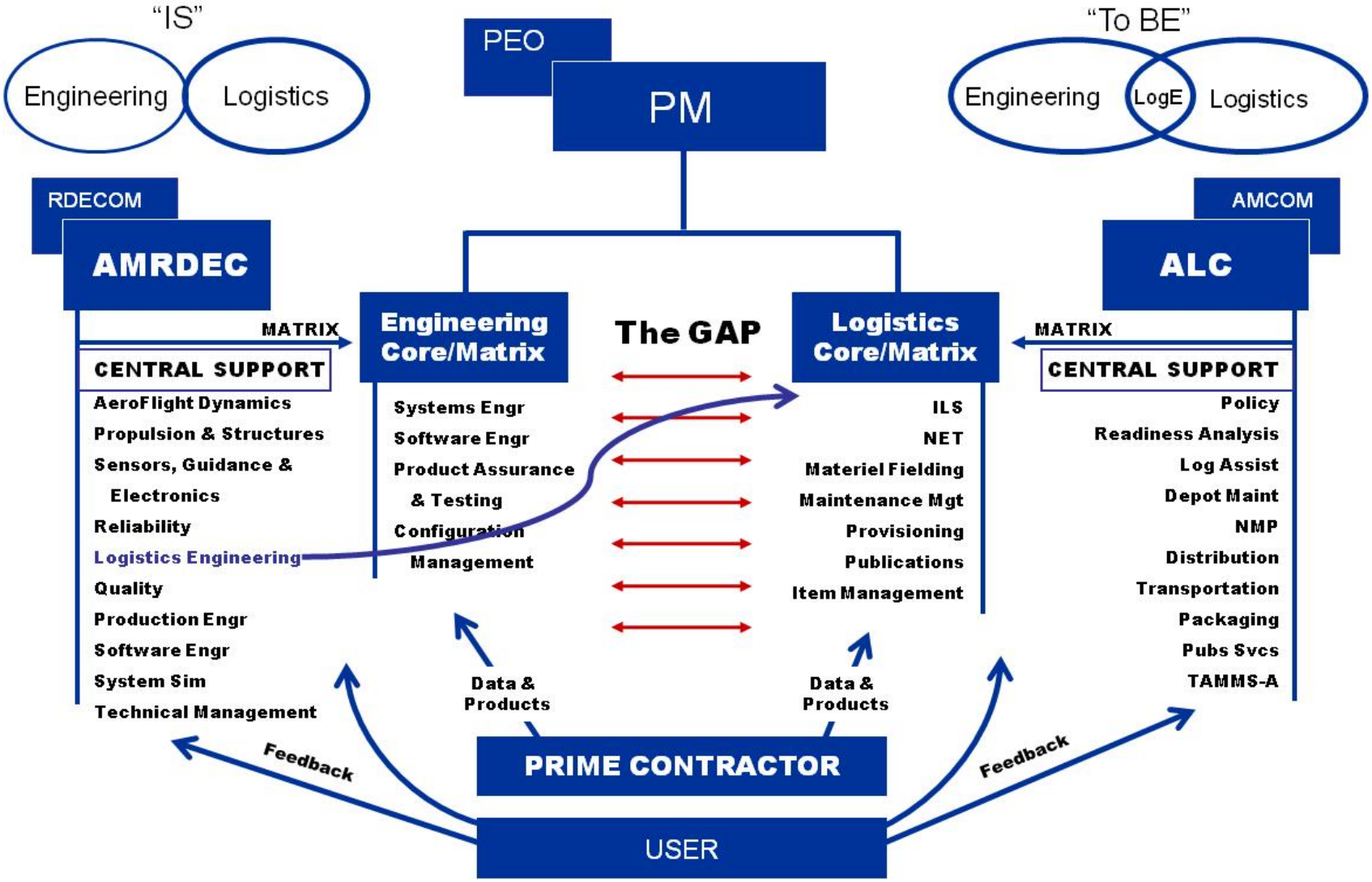
The Gap


"IS"
Engineering
Logistics
PEO
PM
"To BE"
Engineering
LogE
Logistics
RDECOM
AMRDEC
AMCOM
ALC
MATRIX
CENTRAL SUPPORT
AeroFlight Dynamics
Propulsion & Structures
Sensors, Guidance & Electronics
Reliability
Logistics Engineering
Quality
Production Engr
Software Engr
System Sim
Technical Management
Engineering Core/Matrix
Systems Engr
Software Engr
Product Assurance & Testing
Configuration Management
The GAP
Logistics Core/Matrix
ILS
NET
Materiel Fielding
Maintenance Mgt
Provisioning
Publications
Item Management
MATRIX
CENTRAL SUPPORT
Policy
Readiness Analysis
Log Assist
Depot Maint
NMP
Distribution
Transportation
Packaging
Pubs Svcs
TAMMS-A
Data & Products
Data & Products
Feedback
Feedback
PRIME CONTRACTOR
USER

Logistics Engineering

Influence Design for Sustainment

- Reduce Total Ownership Costs and Logistics Footprint
- Increase Readiness
- Reduce Maintenance Burden
- Improve Supply Chain Performance

DESIGN • SUSTAIN
LOGISTICS
LogE
ENGINEERING
SUPPORT • IMPROVE

U.S. ARMY RDECOM

Logistics Engineering Timeline

AMRDEC

DESIGN • SUSTAIN LOGISTICS LogE ENGINEERING SUPPORT • IMPROVE

- Jun 14, FVL
- Apr 15 Log Eng. Lab
- Apr 13, MML
- Jan 14, MDA
- Feb 13 NSRWA
- Aug 13: SE2T Graduation
- Sep 2012 LogE Group Formed
- Jan 2013 AMCOM Express LogE Contract Awarded
- Jul 2012 First LogE II Course
- July 12: AMCOM ALC
- Aug 11: SE2T Pilot Begins
- Dec 11: DOD Award Finalist
- Jan 11: Apache
- Jul 11: LogE Team Formed
- Aug 10: CCWS
- Sep 10: Cargo
- June 10: Logistics Engineering Becomes Top 10 ED Core Function
- July 10: JAMS
- July 09: UAS
- Mar 10: Lakota
- 15 Dec 08: First Advisory Council
- May 09: Blackhawk
- Nov 08: Executive Committee Meeting
- Nov 08: UH-60 Pilot Agreed to by Executive Committee

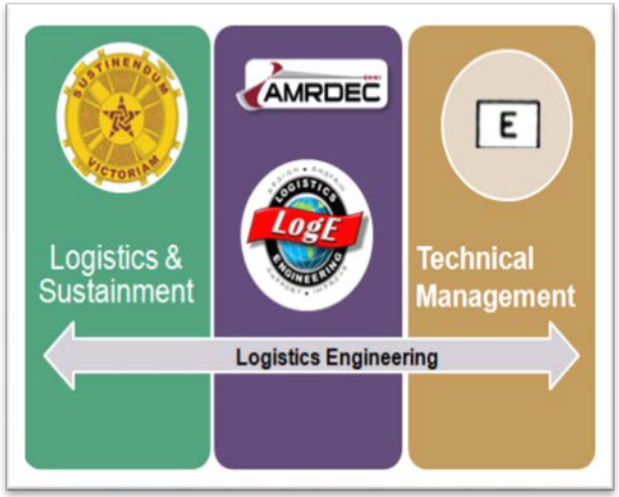
Workshop
Milestone
Project Office Added

19 Govt/ 6 Cont supporting 12 organizations

Logistics Engineering Landscape

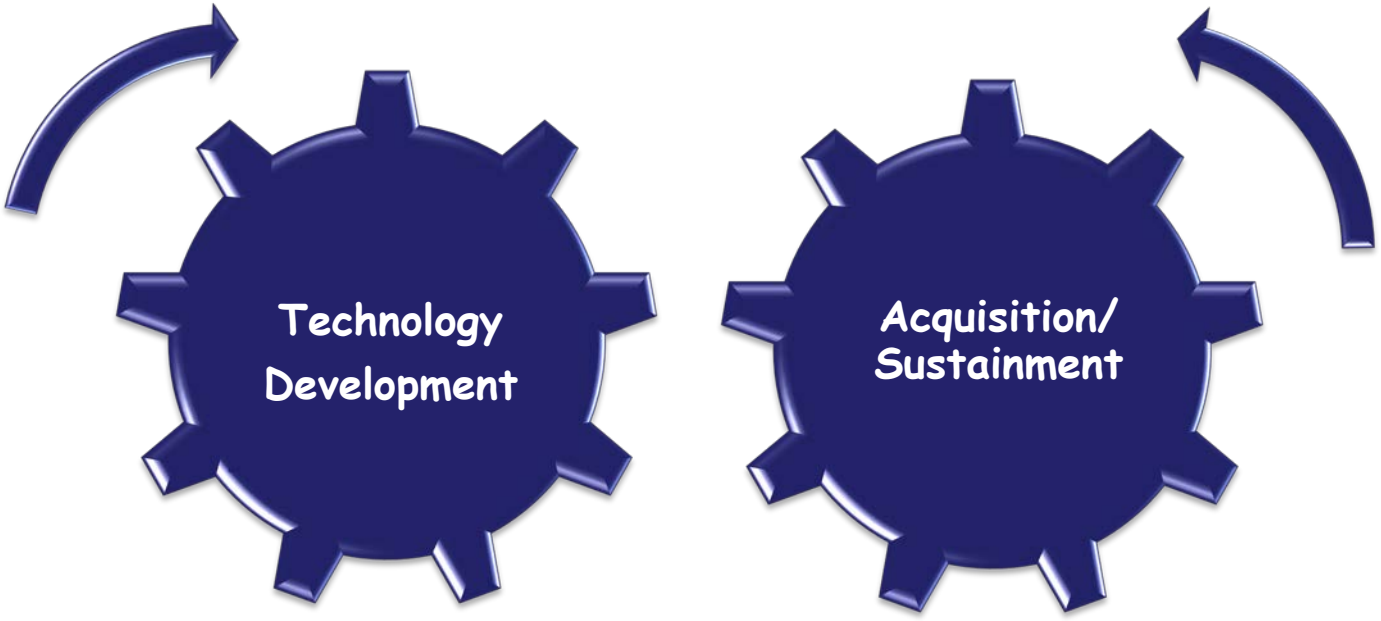
- **Team Meetings**
  - Efforts Peer Reviewed Twice a Month
- **Quarterly Workshops**

PMO



Next Step: Logistics Technology Integration and Assessment

Technology and Sustainment in Sync

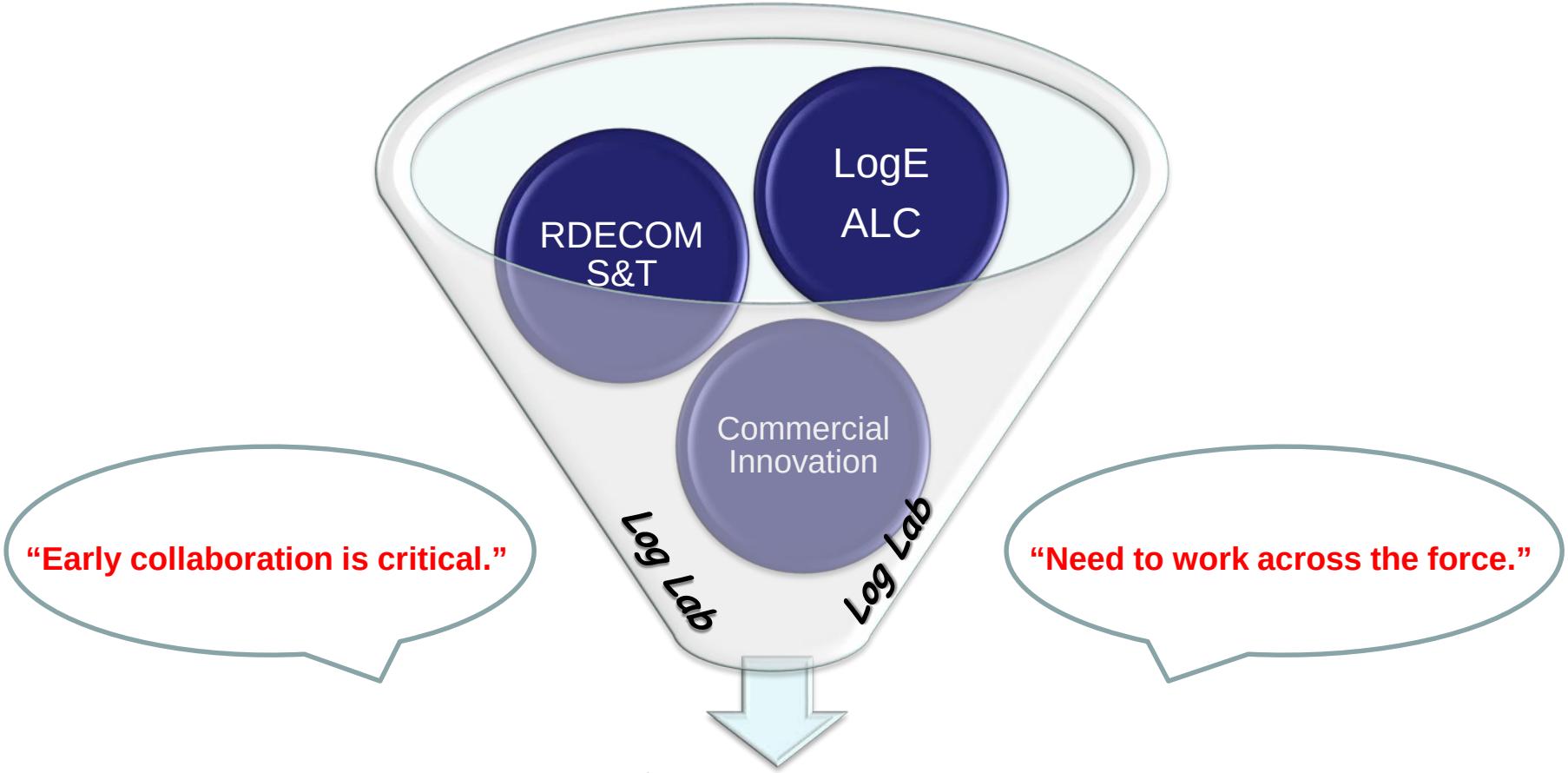


- Major Program New Starts
- Major Modifications to Existing Platforms
- Minor Upgrades
- Component Improvement
- Commercial Technology Advancement

- Logistics Policy
- DOTLmPF-P
- Maintenance Processes
- Supply Processes
- Support Infrastructure

Log Lab Concept

"We must design with sustainment in mind."



Scope of Activities

Collaborative Environment & Logistics Technology Market Place

- Provide environment to cultivate and advance ideas for better utilization of technologies to improve Logistics
- Identify & implement best practices
- Synergy between Tech & Log organizations
- Integrate across directorates, RDECOM

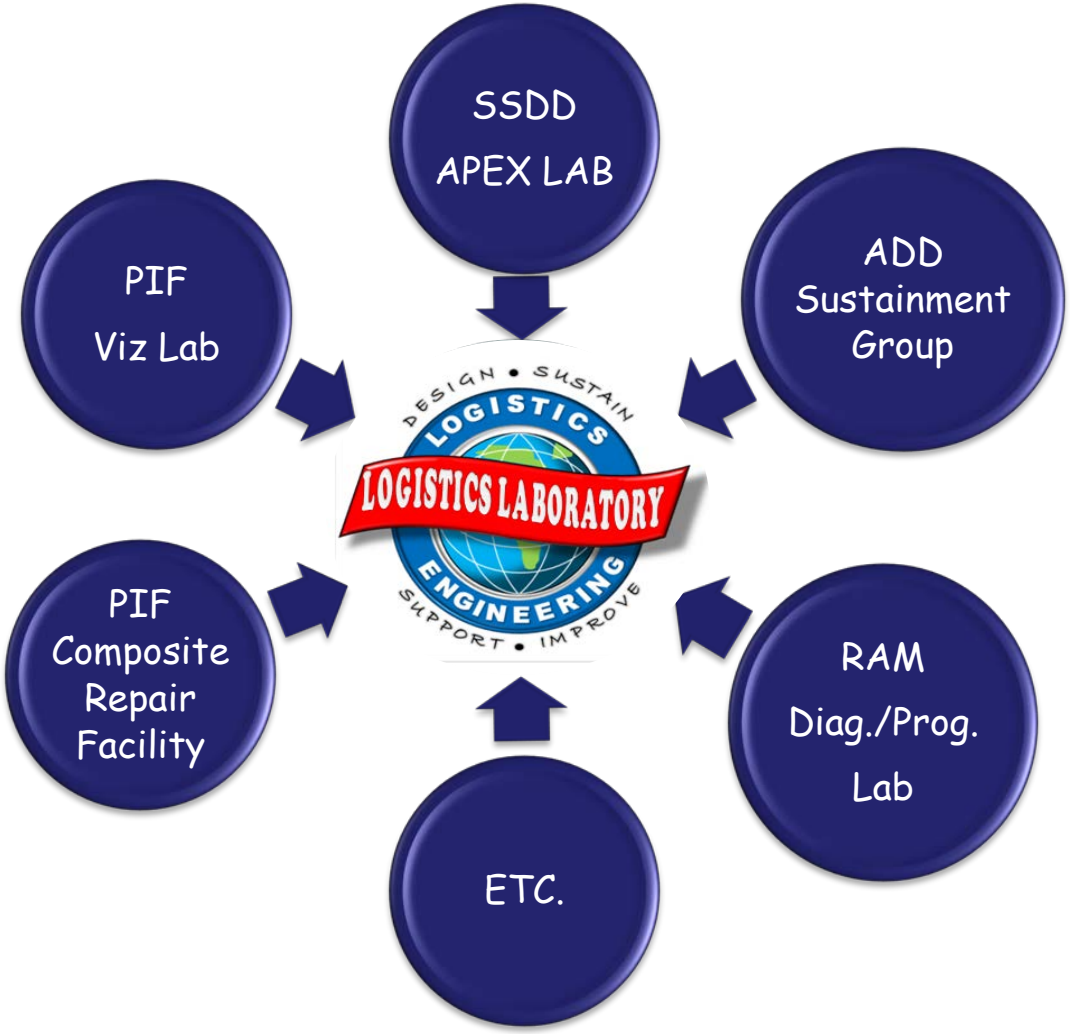
Technology/SML Assessments and Maturation

- Capability to assess technologies in RDECs and industry and their impact on Sustainment
- Assess Sustainment Maturity Levels (SMLs)
- Increase prototyping and experimentation

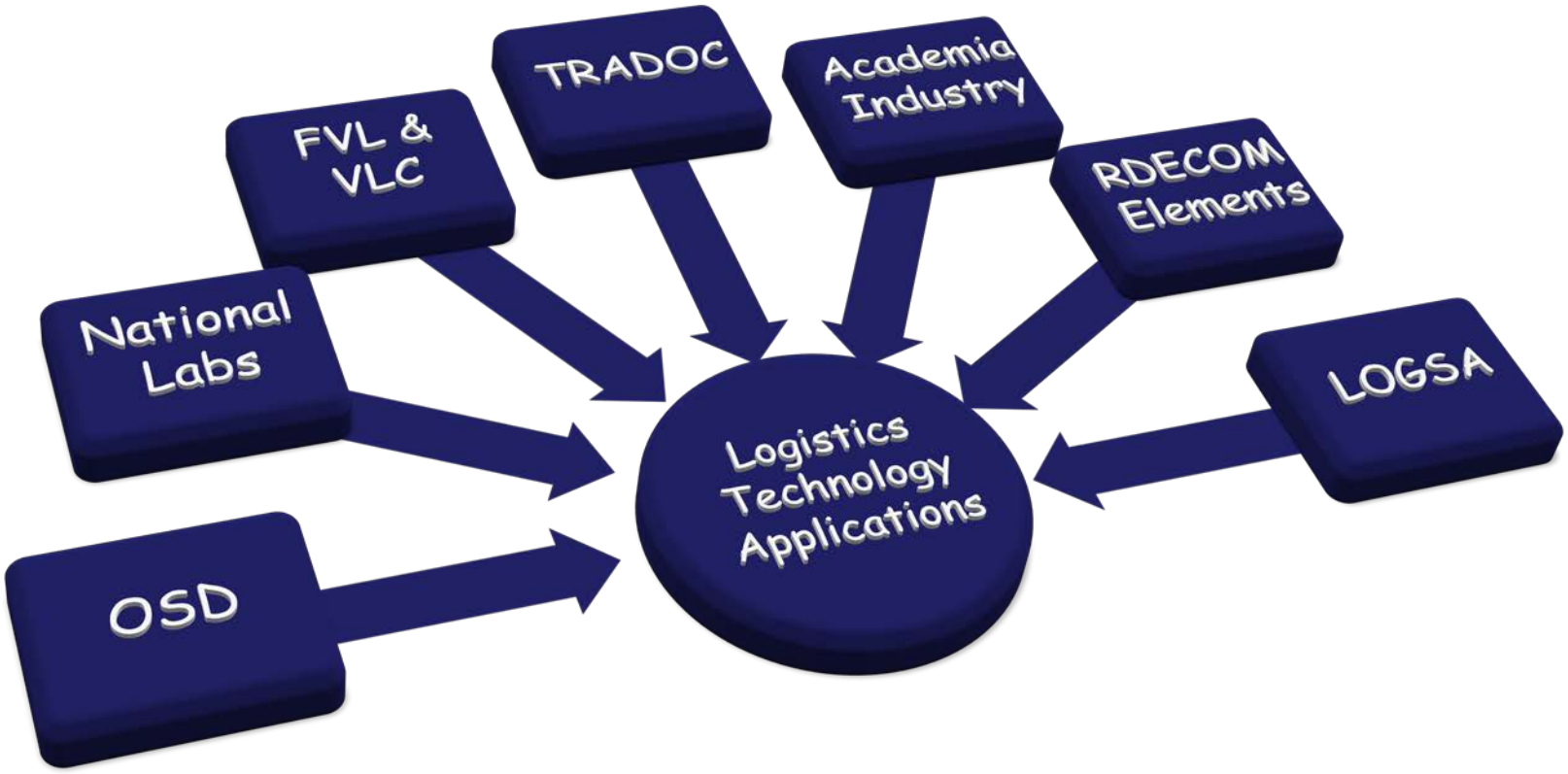
Future Technology R&D

- Provide suggested gaps in R&D to meet Program Sustainment/ Logistics Requirements
- Synergy between Technology & Logistics Reqts
- Involve Industry Early On Technical Reqts

AMRDEC Partners



External Partners



Log Lab Customers

- Aviation/Missile PEOs/PMs
  - Future Vertical Lift (FVL)
  - Multi Mission Launcher (MML)
  - Joint Multi- Role Technology Demonstrator (JMR TD)
- Other PEOs/ PMs
- AMRDEC Directorates
- ALC
- AMC
- RDECOM Organizations
- National Laboratories
- Industry
- Other DOD Elements

Roles and Responsibilities

- Assess progress of current lab projects
- Provide guidance and recommendations on potential projects and collaboration areas.
- Prioritize future projects
- Assist in the identification of resources to accomplish lab efforts. This includes manpower, funding, facilities, equipment, and other resources necessary to accomplish the effort.
- Assess gaps in the Logistics/Supportability areas to be recommended to the S&T community for further research.

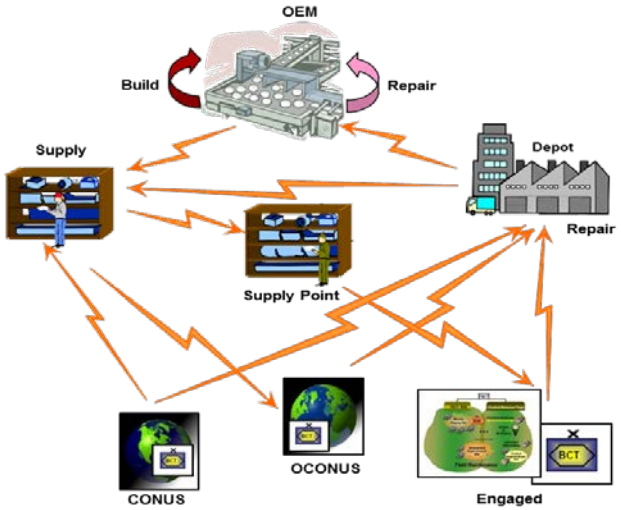
Membership

- AMCOM
- AMRDEC
- PEO/PM participation as required
- Logistics Engineering Lab Team

Logistics Engineering Lab Simulation

- **Simulation Tools**
  - **Evaluate Operational and Materiel Availability**
  - **Sustainment and logistics burdens**
  - **Optimum design within a complex trade space of competing requirements**

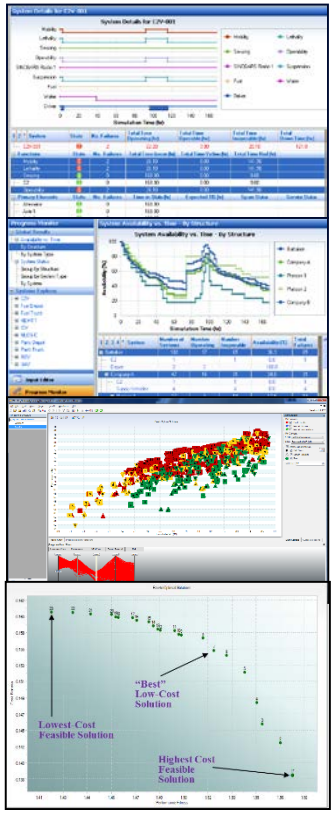
Leveraging existing government simulation facilities and off the shelf software



Coordinated Effort Between

- **AMRDEC**
  - **Engineering Directorate**
  - **System Simulation Development Directorate**
- **AMCOM Logistics Center**
- **Sandia National Labs**

Initial Efforts – Utilization of Sandia Lab Simulation Capabilities



- **Two Sandia analytic capabilities:**
  - ***System-of-Systems Analysis Toolset (SoSAT)*** **– System of Systems (SoS) simulation for integrated mission scenario analytics**
  - ***Whole System Trade Analysis Tool (WSTAT)*** **– Requirements trade space optimization**

- **Tools developed and applied by Sandia across multiple DoD programs to evaluate**
  - **Simulate fleet compositions to maximize performance, optimize support structures, and minimize costs**
  - **Goal is to interface with existing and emerging Battlefield Simulations hosted by SSDD APEX Lab**

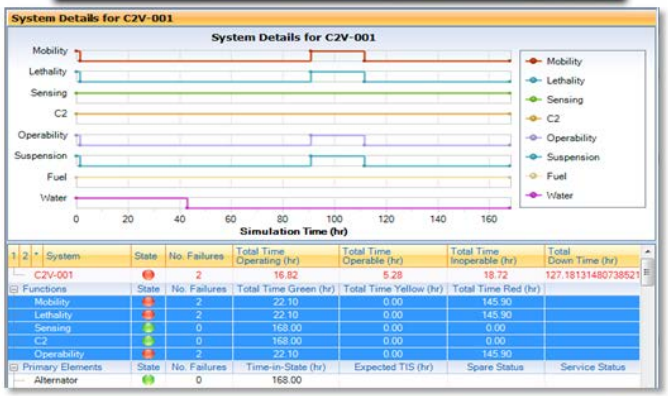
- **Leveraging 15-year Army investment in tools and formal verification and validation (V&V)**

- **Kickoff will be late 9 Sep 2015.**

SOSAT Data Collection

- **Data Collected**
  - FMSWeb
    - MTOE
  - MCDS
    - 2410
    - WUC Structure
  - FM 3-04 Army Aviation (July 2015)
    - Force Structure
    - Fuel Burn Rates
  - Tech Manuals
    - MAC
    - Service Schedule
- **Data Remaining**
  - RAM
    - RAM to send representative
  - Aircraft OPTEMPO
    - Combat
    - Garrison
  - Supply Delay Times
  - Combat Damage
    - OneSAF
    - VRForces
  - Reset Impact

Tracks individual system components and functional availability over time



Tracks SoS functional availability and statistics over time

Assessment of Analytical Software

- **Defense Technical Information Center (DTIC)**
  - **The tools include Systecon Opus Suite (Opus 10, SIMLOX, and CATLOC).**
  - **Model highly complex aviation and missile support systems**
  - **Optimize Aviation and Missile logistics support solutions, sparing, warehousing and distribution structure, repair/re-order policy, optimize repair locations and compositions to maximize performance, optimize support structures and forecast to minimize life cycle costs**

- **LOGSA**
  - **Latest Compass Version**
  - **Traditional Level of Repair Analysis (LORA) model utilized to optimize repair levels and project initial repair quantities**
  - **Projects operations and support costs**

Blade Analytics Model

- **Model capability is to assess future procurement strategy for the UH-60 blades based on previous, current, and future demands.**
- **Can conduct "what ifs" based on inputs and variables.**
- **Data sources include: 1) 2410 Lifetime Pull, 2) 2410 Last record Status, and 3) Serial Numbers of Interest**

- Inputs/Variables
  - Flight Hrs per Depot Visit
  - Fleet size
  - MTR
  - O/H Limit
  - Life Limit
  - Demil Attrition Rate
  - Projected Flight Hrs
  - Project Aircraft Attrition Rate
  - Depot UICs

- Results/Outputs
  - # Repaired
  - # Installed
  - # Demiled
  - # Procured
  - Spare Ratio
  - # Demiled for Life Limit

Vertical Lift Consortium Sustainment Topics

- **Two Topic Areas with 6 Subtopics**
  - **Enhanced Maintenance Techniques**
    - Pit Stop
    - Minimization of Field Support Equipment
    - Modularity of Design of Complex Aviation Hardware
    - Maintenance Support Group-3
  - **Integrated Product Support Data Analysis**
    - Real Time Maintenance Data Analysis, Compression, Mining, Transmission
    - Complex Logistics Simulations/Models
- **Multiple Industry Submissions in Each Subtopic**
- **Current Funding For Selection of Two Proposals**

Logistics Engineering Lab Goals

- **Go-to place for information on ongoing technology efforts impacting Logistics/Supportability**

- **Collaboration between logistics and engineering organizations**
  - **Identification of technologies related to Logistics/Supportability**
  - **Assessment of sustainment technologies**
  - **Identification of technology gaps in Logistics/Supportability**
  - **Coordination with S&T community to help prioritize research for Logistics/Supportability**

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