



M&S Tools for Life Cycle Management

Dave Robertson, LMI
on behalf of
Mr. Randy Fowler, ADUSD(MR)



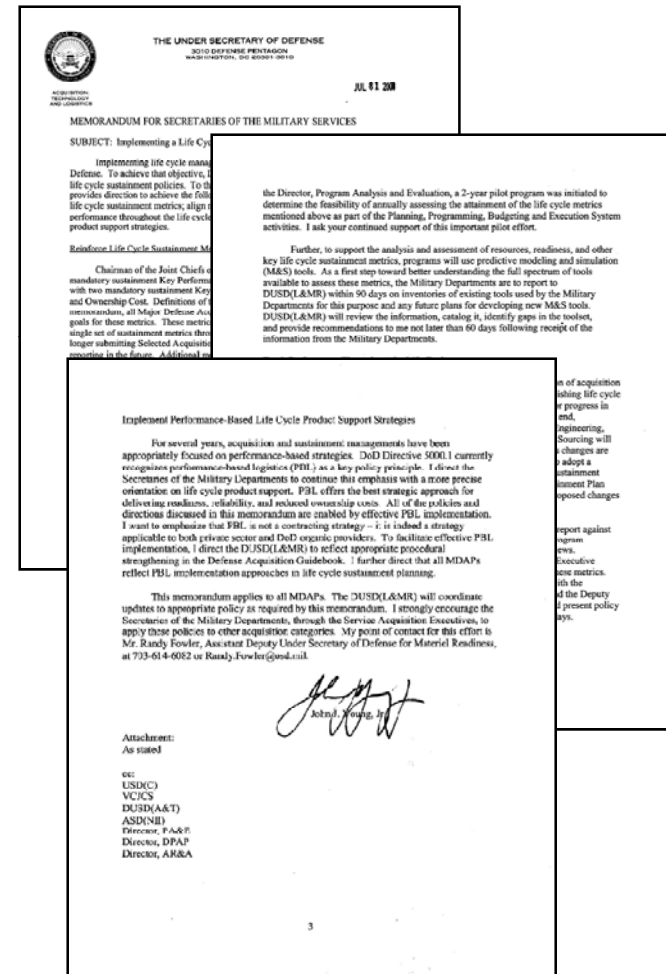
Agenda

- Task from USD(AT&L)
- LCM Tool Assessment
- Observations



AT&L Policy Memo on LCM

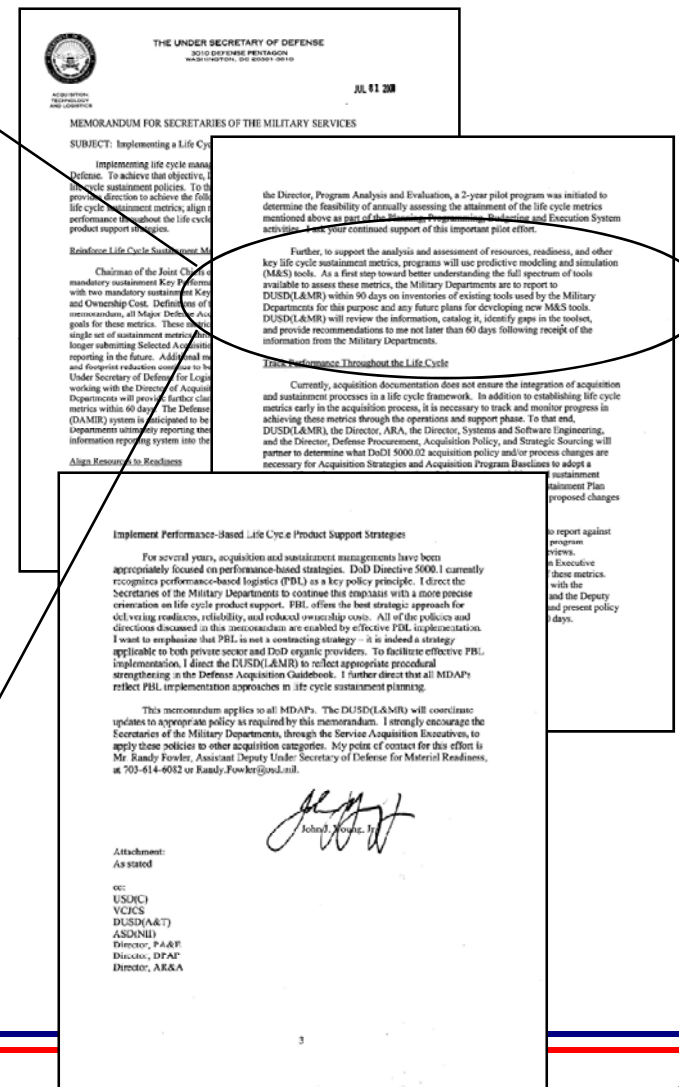
1. Reinforce Life Cycle Sustainment Metrics
 - Materiel Availability, Reliability, and Ownership Cost
2. Align Resources to Readiness
3. Track Performance Throughout the Life Cycle
4. Implement Performance-Based Life Cycle Product Support Strategies





M&S Task in LCM Memo

- Programs will use predictive M&S tools to assess life cycle sustainment metrics
- Military Departments must report to L&MR on inventories of existing tools ***used for this purpose***
- L&MR will review the information, catalog it, identify gaps in the toolset, and provide recommendations





Review Approach

- Each military department issued a call for information (name of tool, purpose, functional description, POC)
- Categorized all tools for top-level summary information
 - Life Cycle Sustainment Metrics
 - Materiel Availability
 - Reliability
 - Ownership Cost
 - Logistics elements
 - Maintenance Planning
 - Supply Support
 - Training & Training Support
 - Computer Resources Support
 - Facilities
- Limited the analysis to tools related to LCM and sustainment of major weapon systems

CJCSI 3170.01F

- Downtime
- Other

- Design Interface
- PHS&T
- Technical Data
- Manpower & Personnel
- Support Equipment



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Overview of Inputs

- Army
 - 153 inputs
 - Most cited tools: COMPASS (7), SESAME (7)
 - Number in final vetted toolset: 76
 - Navy
 - 119 inputs
 - 39 inputs related to cost and budget requirements
 - Number in final vetted toolset: 61
 - Air Force
 - 125 inputs
 - 21 inputs related to the physics of failure
 - Number in final vetted toolset: 46
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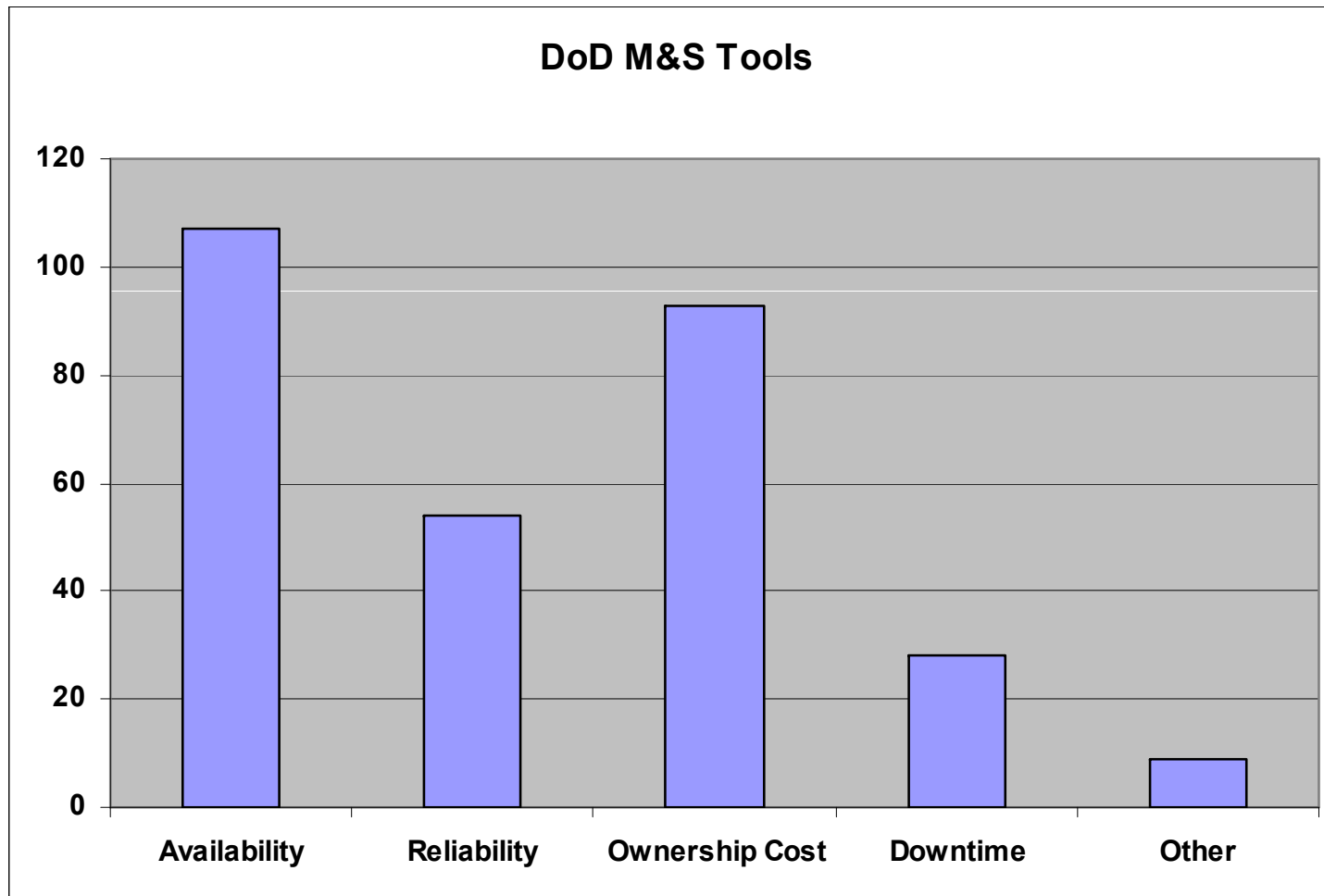
Sample Review - USAF

<u>Model Name</u>	<u>Government POC (users/owners)</u>	<u>Programs and Purpose (what programs use the model and for what purpose?)</u>	<u>Functional Description</u>
Airborne Laser On-Station Availability Model (ABL OSA)	AFMC	Operational/Maintenance Readiness	ABL OSA is a simulation model developed at OAS to estimate the on-station availability of the ABL. The model considers laser fuel support equipment availability, inventory levels, ABL deployment scenarios as well as ABL mission parameters.
AIRCAT Center Wing Box Management Tool	WR-ALC	Maintenance	Used to predict C-130 equivalent baseline hour consumption based on ops-tempo in order to forecast when the aircraft will reach its grounding point. Essential in managing flying hours so aircraft don't ground prior to scheduled center wing box replacement
Aircraft Sustainability Model	AFMC	Supply	Computes optimized quantity requirements for deployable aircraft spares kits given a flying hour scenario. Also assesses readiness spares kits for Status of Resources and Training System (SORTS) in terms of predicted aircraft availability.
Aircraft Trim, Linearization and Simulation program (ATLAS)	AAC	The ATLAS program is a 6-degrees of freedom (DOF), nonlinear, non-real time simulation that contains numerous configurations within its aerodynamic database available for analysis.	The ATLAS program is a 6-degrees of freedom (DOF), nonlinear, non-real time simulation that contains numerous configurations within its aerodynamic database available for analysis.

<u>Sustainment Metric(s) addressed (availability, reliability, downtime, ownership cost)</u>	<u>ILS elements addressed</u>	<u>Keep (√) Discard (X)</u>	<u>Rationale</u>
Availability	Maintenance Planning Supply Support Support Equipment	√	
Availability Downtime	Maintenance Planning	√	
Availability Ownership Cost	Supply Support PHS&T Maintenance Planning	√	
None	No ILS	X	System performance.

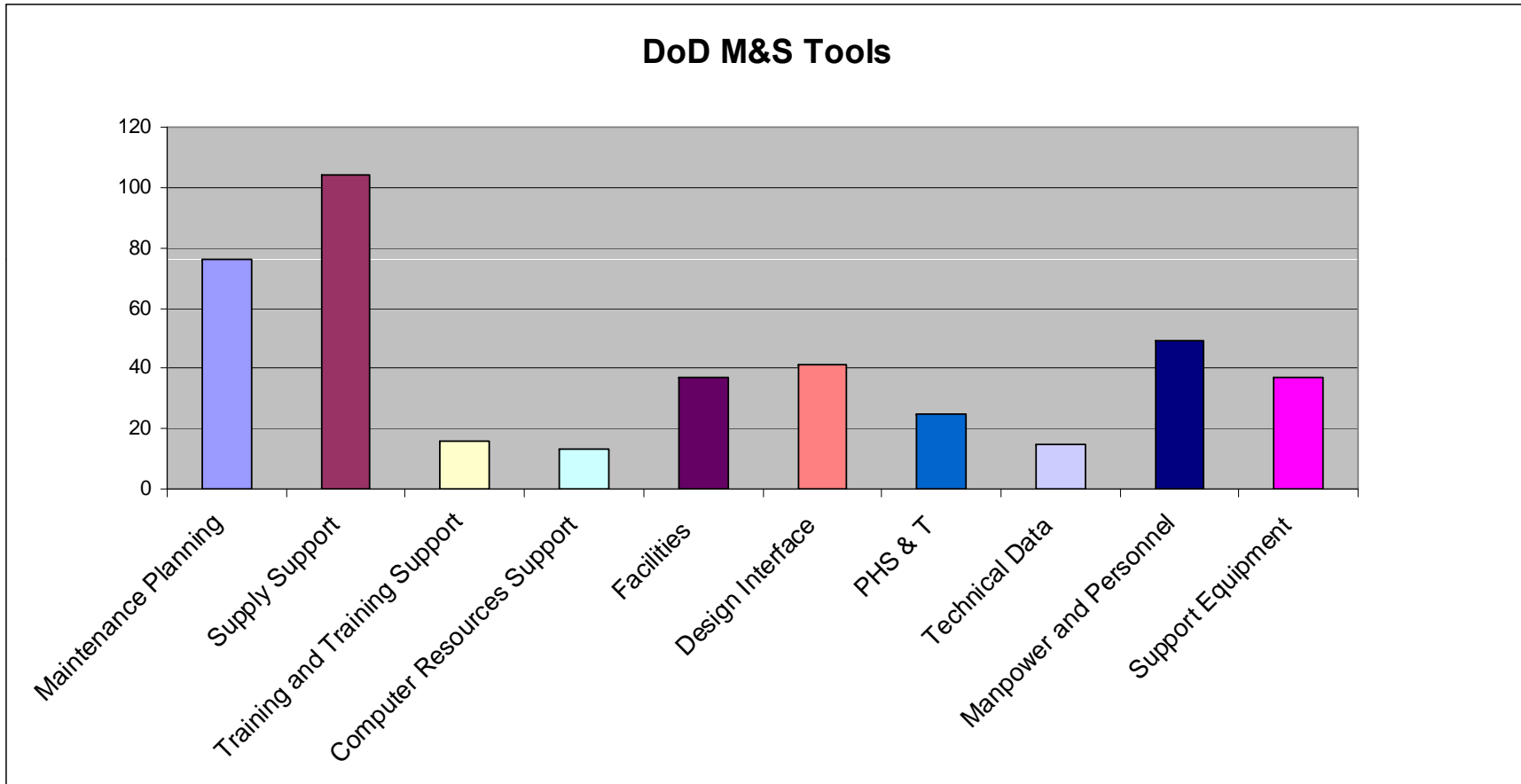


Sustainment Metrics



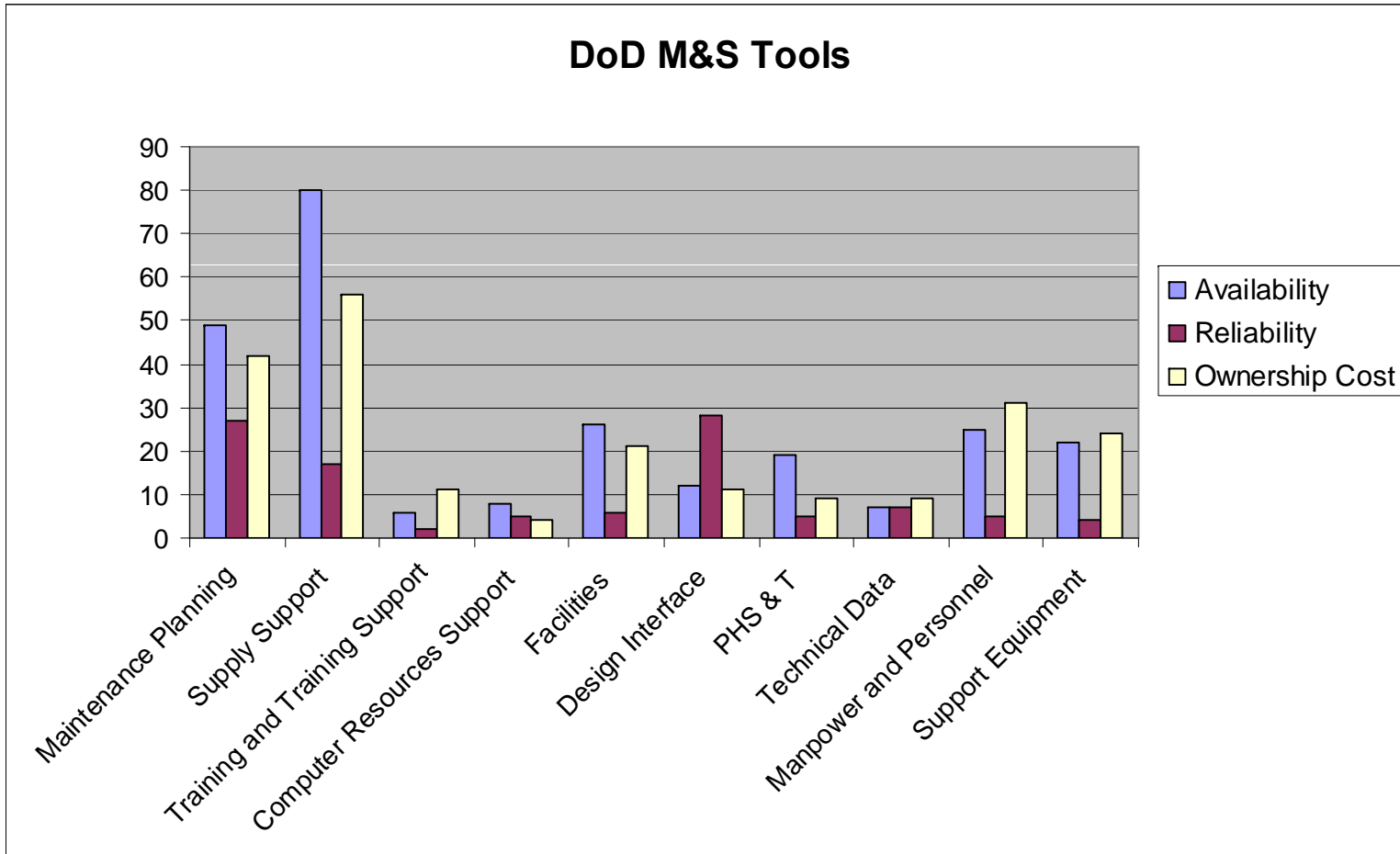


Logistics Elements





Logistics Elements - Metrics Comparison





Other Metrics

- DMSMS risk
- Runtime
- Energy costs/usage
- Availability of networks / computer equipment
- Weapon load out
- Fuel usage
- Transportation throughput
- Personnel Readiness
- Deployment efficiency
- Maintenance efficiency
- Hazard risk
- Supply information system readiness
- Information throughput
- Infrastructure service life



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Observations

- Multiple tools are required to fully perform LCM analysis
 - Tools tend to be created for a single functional area or metric
 - Resource decisions may involve trade-offs which cut across tools
- Input assumptions (e.g., operational tempo and employment) significantly influence M&S forecasts
 - Creates confidence issue with long-term projections
 - A more extensive tool with detailed input does not improve confidence level