OSD VISION FORWARD FOR

Unmanned Aircraft Roadmap

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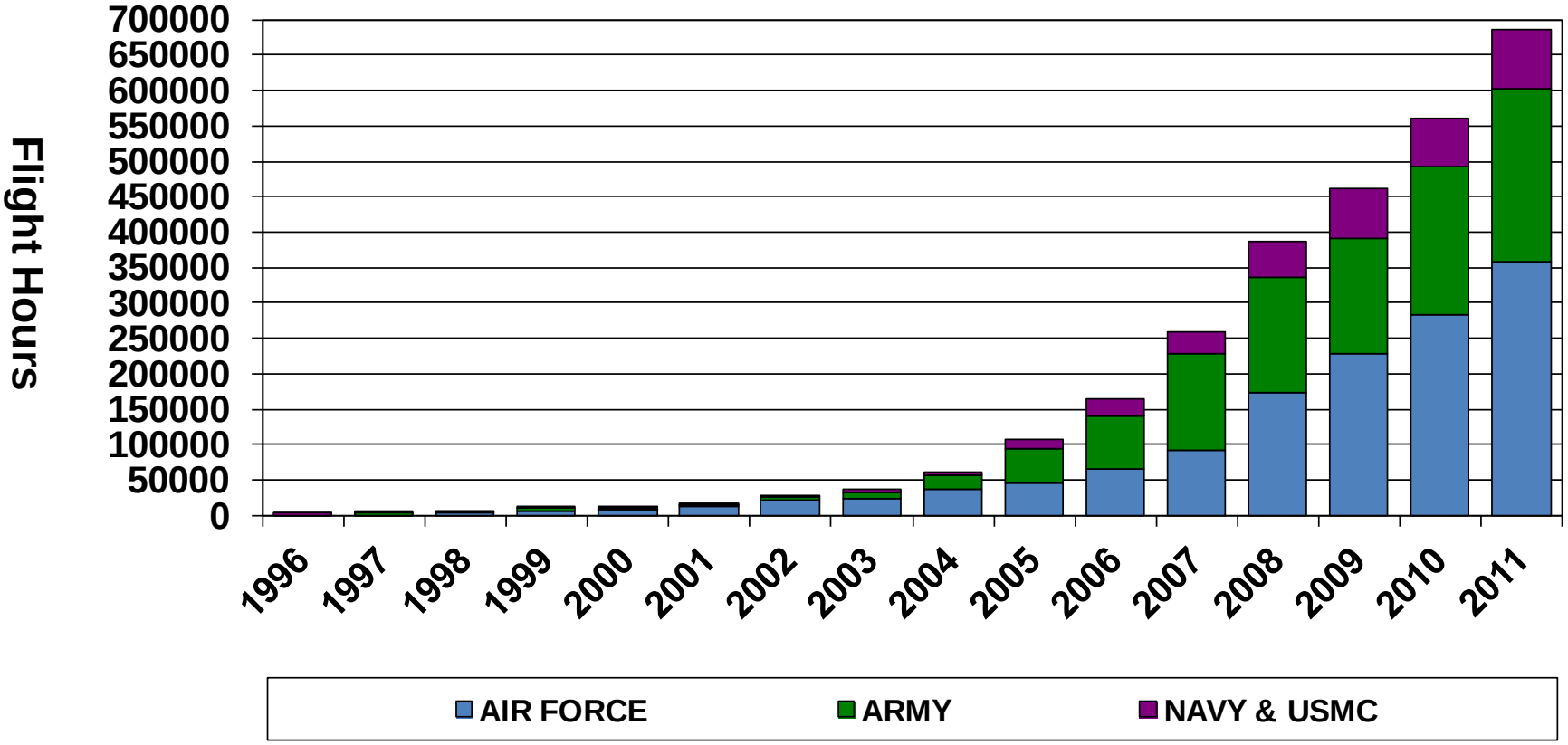
NDIA Oct 27th 2011

Overview

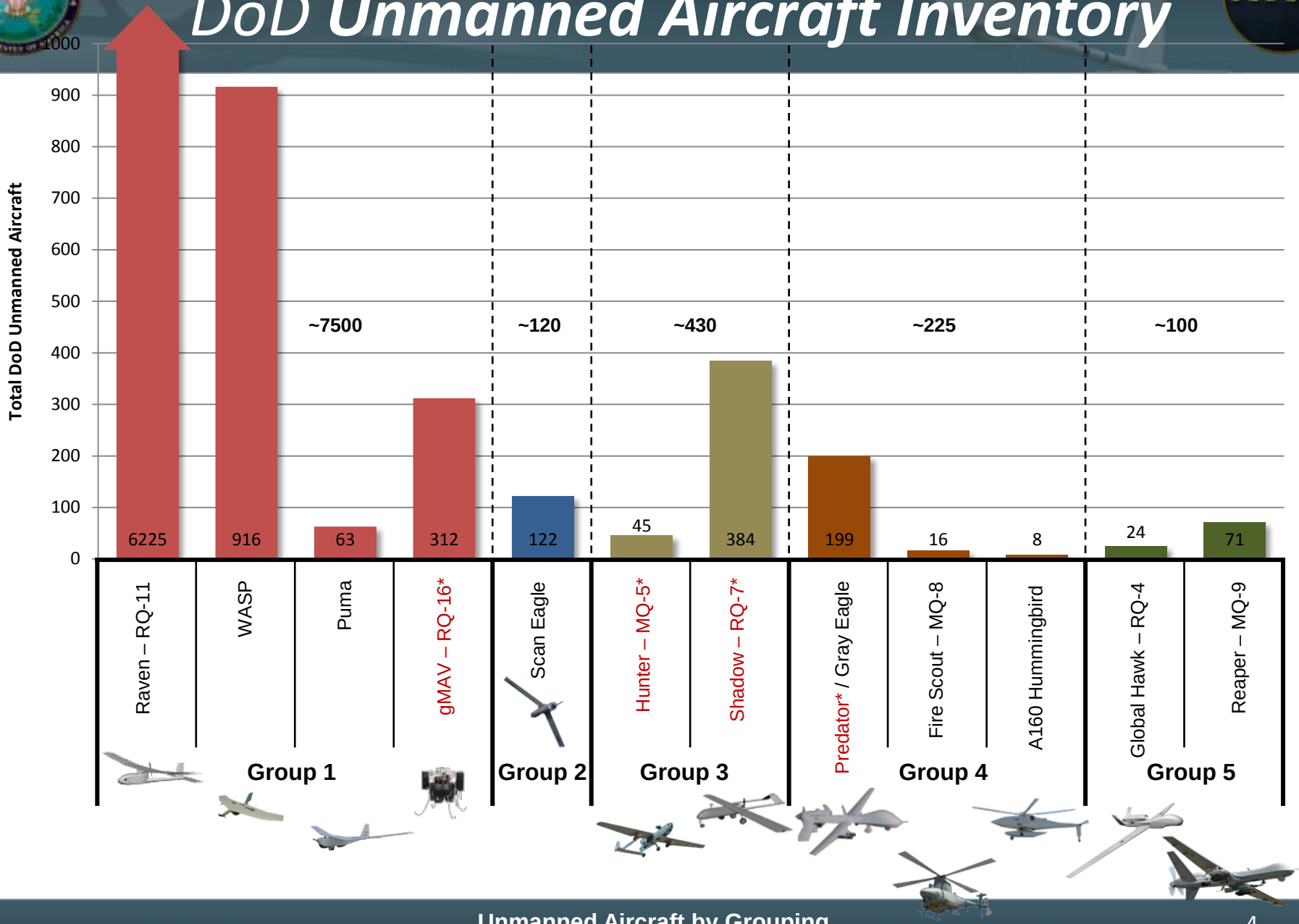
- Current UAS Status
- Acquisition Challenges
- Vision and Roadmap
  - Interoperability
  - Airspace Integration
  - Unmanned Systems Roadmap
- Summary

DoD UAS Flight Hours (By Department, By Fiscal Year)



Does not include Group 1 UAS

DoD Unmanned Aircraft Inventory



Unmanned Aircraft by Grouping

DoD *Acquisition* Challenges

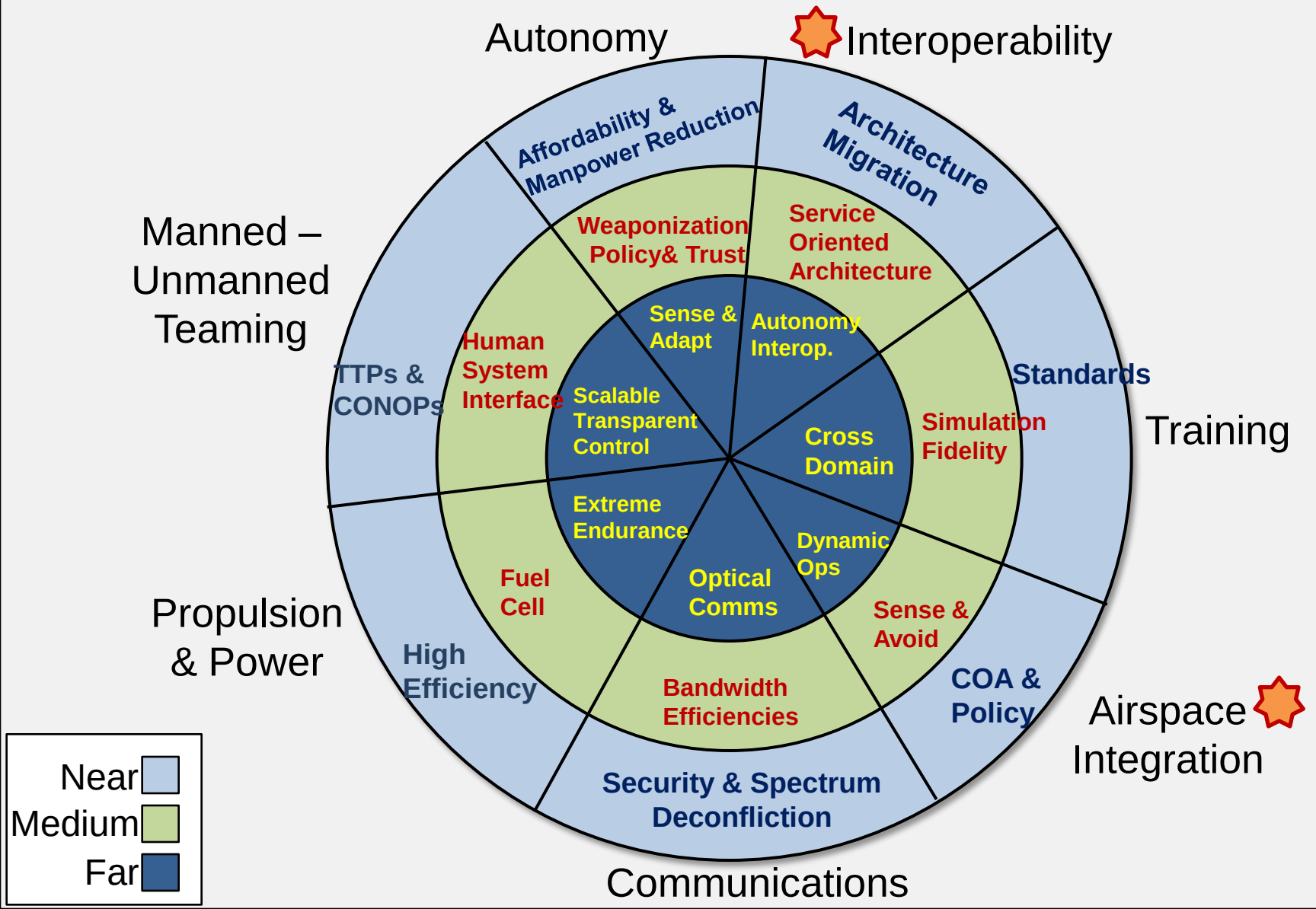
- **Acquisition Efficiencies & Affordability**
- **Interoperability**
- **Airspace Access**
- **Frequency Spectrum**
- **Cost Control**
- **Acquisition Performance**
- **Technology Transition**
- **Sustainment Planning**
- **Open Business Model**

Reuse verses Start New

Our program managers should be scrutinizing every element of program costs, assessing whether each element can be reduced relative to the year before, challenging learning curves, dissecting overheads and indirect costs, and targeting cost reduction with profit incentives - in short, executing to what the program should cost.

Under Secretary of Defense (AT&L) Memo to Acquisition Professionals, Better Buying Power, Sept 2010

Meeting the Challenges
Unmanned System Roadmap



Introduction/Vision

Vision: Seamless integration of diverse unmanned capabilities that provide flexible options for Joint Warfighters while exploiting the inherent advantages of unmanned technologies, including persistence, size, speed, maneuverability, and reduced risk to human life. DoD envisions unmanned systems seamlessly operating with manned systems while gradually reducing the degree of human control and decision making required for the unmanned portion of the force structure.

System	Lead Service	Capabilities	ACAT	Acq. Phase
AIR SYSTEMS				
GROUP 1 ~~~~~ 0-20 LBS, <1,200 AGL, <100 KIAS				
RQ-16B T-Hawk	US Navy	ISR/RSTA, EOD	Non-ACAT	Other
Wasp	US Air Force	ISR/RSTA	Non-ACAT	Other
RQ-11B Raven	US Army	ISR/RSTA	IV(T)	Other
AECV SUAS (Puma AE)	US SOCOM	ISR/RSTA, FP	III	MS-C
GROUP 2 ~~~~~ 21-55 LBS, <3,500 AGL, <250 KIAS				
Scan Eagle	US Navy, US Marines	ISR/RSTA, Force Protection	Non-ACAT	Other
GROUP 3 ~~~~~ <1,320 LBS, <18,000 MSL, <250 KIAS				
MQ-5B Hunter	US Army	ISR/RSTA, EW, Force Protection		Sustainment
RQ-7B Shadow	US Army	ISR/RSTA, C3, Force Protection	II	Post- MS-C
RQ-21A STUAS	US Navy, US Marines	ISR/RSTA, EOD, Force Protection	III	MS-B
Viking 400	Special Ops	ISR/RSTA, EW, Force Protection	III	MS-C
GROUP 4 ~~~~~ >1,320 LBS, <18,000 MSL, ANY SPEED				
MQ-1C Gray Eagle	US Army	ISR/RSTA, C3, Log, PS/TCS, FP	I D	MS-C
MQ-1B Predator	US Air Force	ISR/RSTA, PS/TCS, FP	I D	MS-C
MQ-8 VTUAV (Fire Scout)	US Navy	ISR/RSTA, ASW, SUW/ASUW, MIW/OMCM	I C	MS-C
GROUP 5 ~~~~~ >1,320 LBS, >18,000 MSL, ANY SPEED				
MQ-4 BAMS	US Navy	ISR/RSTA, EW, PS/TCS,, SUW/ASUW, FP	I D	MS-B
MQ-9A Reaper	US Air Force	ISR/RSTA, EW, PS/TCS, FP	I D	MS-C
RQ-4A Global Hawk	US Air Force	ISR/RSTA, C3, PS/TCS	I D	
RQ-4B Global Hawk	US Air Force	ISR/RSTA, C3, PS/TCS		
LIGHTER THAN AIR				
Blue Devil	US Air Force			
Long Endurance Multi-Intelligence Vehicle (LEMV)	US Army	ISR/RSTA, C3	Other	Pre MS-B
Persistent Threat Detection System (PTDS)	US Army	ISR/RSTA, C3, Force Protection, Inspection/Identification	Other	Other

Roadmap &Catalog: https://extranet.acq.osd.mil/uwir/ (CAC Protected)

Roadmap: http://www.acq.osd.mil/sts/organization/uw.shtml

OSD is Improving Interoperability and Affordability of UAS GCSs Through Open Business Processes

1 **Feb. 2009, OUSD (AT&L) Mandates Common GCS Architecture**


THE UNDER SECRETARY OF DEFENSE

MEMORANDUM FOR SECRETARY OF THE ARMY
SECRETARY OF THE NAVY
SECRETARY OF THE AIR FORCE

SUBJECT: Unmanned Aircraft Systems (UAS) Ground Control Station (GCS) Acquisition Decision Memorandum (ADM) – Predator, Reaper, Sky Warrior, Global Hawk, Broad Area Maritime Surveillance, Fire Scout, Shadow, and Hunter

On December 12, 2008, I conducted a Program Review of the GCS development and procurement programs for Air Force Predator/Reaper and Army Sky Warrior UAS. This review convinced me that the acquisition team has the opportunity to do something truly joint and powerful by adopting a common GCS architecture that is open and that will allow for rapid addition of modular functionality. This architecture will enable the warfighter to add capability, offer competitive options, encourage innovation and increase cost control. It can also reduce future complexities with regard to GCS usage, dramatically improve interoperability and data access, and increase training efficiencies.

From an acquisition perspective, adopting a common GCS architecture utilizing a core open architecture model will allow us to compete among many companies to provide new tools like visualization, data retrieving and tagging, and auto tracking. This will allow for a range of procurement options, including "build to print" for large quantity buys. We can provide flexibility to adapt the man-machine interface for specific Military Service's Concept of Operations while maximizing commonality on the underlying architecture and computing hardware. Further, in conjunction with modifications to selected aircraft, we can implement technologies such as autonomous take-off and landing across the Military Services to minimize aircraft losses in those mission phases. These improvements can also reduce training requirements, decrease training time, and increase the pool of UAS pilots/operators.

Accordingly, I direct the following:

1. Within 45 days, the Army, Navy, and Air Force will present to me a consolidated list of all programs and associated sustainment plans related to development of UAS Ground/Air Control Station capabilities. I will consider these programs for special interest designation.
2. For the FY2011 budget review efforts, the Global Hawk, Broad Area Maritime Surveillance (BAMS) UAS, Reaper, Predator, Sky Warrior, and Navy Fire Scout/Vertical

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2 **Sept. 2010, OUSD (AT&L), Mandates More Competition**


OFFICE OF THE UNDER SECRETARY OF DEFENSE

MEMORANDUM FOR ACQUISITION PROFESSIONALS

SUBJECT: Better Buying Power: Guidance for Obtaining Greater Efficiency and Productivity in Defense Spending

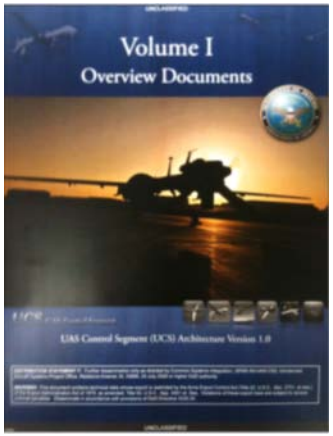
On June 28, I wrote to you describing a mandate to deliver better value to the taxpayer and warfighter by improving the way the Department does business. I emphasized that, next to supporting our forces at war, we are an urgent basis, this was President Obama's and Secretary Gates' highest priority for the Department's acquisition professionals. To put it bluntly, we have a continuing responsibility to procure the critical goods and services our forces need in the years ahead, but we will not have ever-increasing budgets to pay for them. We must therefore strive to achieve what economists call productivity growth: or simply terms, to DO MORE WITH LESS. MORE. This memorandum contains specific Guidance for achieving the [sic] 20 mandate.

Secretary Gates has directed the Department to pursue a wide-ranging Efficiencies Initiative, of which this Guidance is a central part. This Guidance affects the approximately $400 billion of the $700 billion defense budget that is spent annually on contracts for goods (weapons, electronics, fuel, facilities etc., amounting to about $200 billion) and services (IT services, knowledge-based services, facilities upkeep, weapons system maintenance, transportation, etc., amounting to about another $200 billion). We estimate that the efficiencies targeted by this Guidance can make a significant contribution to achieving the $100 billion reduction of defense budget dollars from unproductive to more productive purposes that is sought by Secretary Gates and Deputy Secretary Lynn over the next five years.

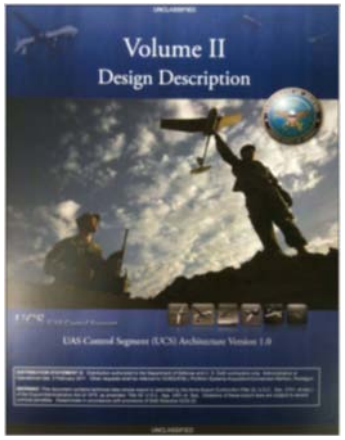
Since June, the senior leadership of the acquisition community – the Component Acquisition Executives (CAEs), senior logisticians and systems command leaders, OSD officials, and program executive officers (PEOs) and program managers (PMs) – has been working regularly with me to refine and craft this Guidance. We have analyzed data on the Department's practices, expenditures, and outcomes and examined various options for changing our practices. We have sought in these the specific actions I am directing today on the best data the Department has available to it. In some cases, however, this data is very limited. In these cases, the Guidance makes provision for future adjustments as experience and data accumulate as the accelerated consequences can be detected and mitigated. We have conducted some preliminary estimates of the dollar savings anticipated from each action based on reasonable and gradual, but steady and determined, progress against a clear goal and confirmed that they can indeed be substantial.

Changing our business practices will require the continued close involvement of others. We have sought out the best ideas and initiatives from industry, many of which have been adopted in this Guidance. We have also sought the input of outside experts with decades of experience in defense acquisition.

3 **Mar. 2011, UCS Publishes Common GCS Architecture Vol. 1**



4 **Mar. 2011, GCS Architecture Vol. 2 Released**



5 **Jun. 2011, Open Bus Model Released**

OSD has developed a common architecture and designed an open business model to meet its objectives

OA Acquisition Objectives

To remove the traditional barriers to Effective Competition in the UAS Control Segment and provide market access to a broad, heterogeneous industrial base of software providers in an agile acquisition and integration environment.

UCS Vision

OSD (AT&L)

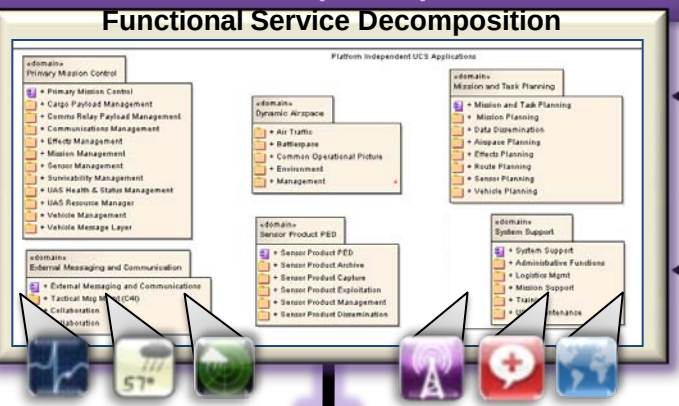
Army

Navy

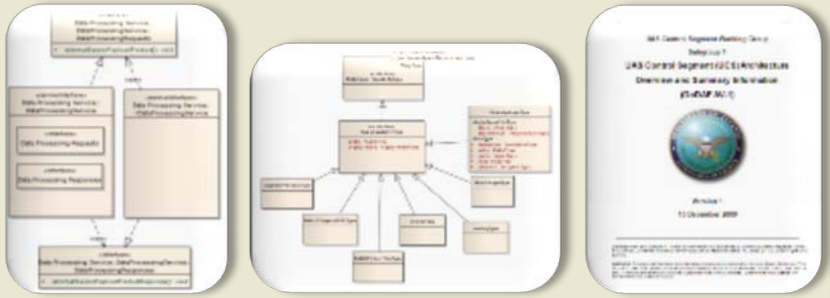
Air Force

Industry

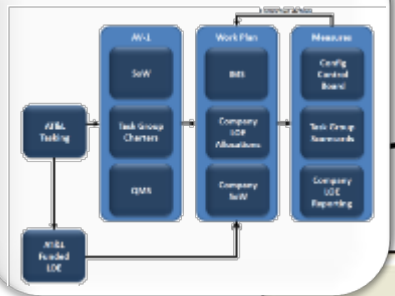
Functional Service Decomposition



Interfaces, Data Models, and Documentation



Governance Process

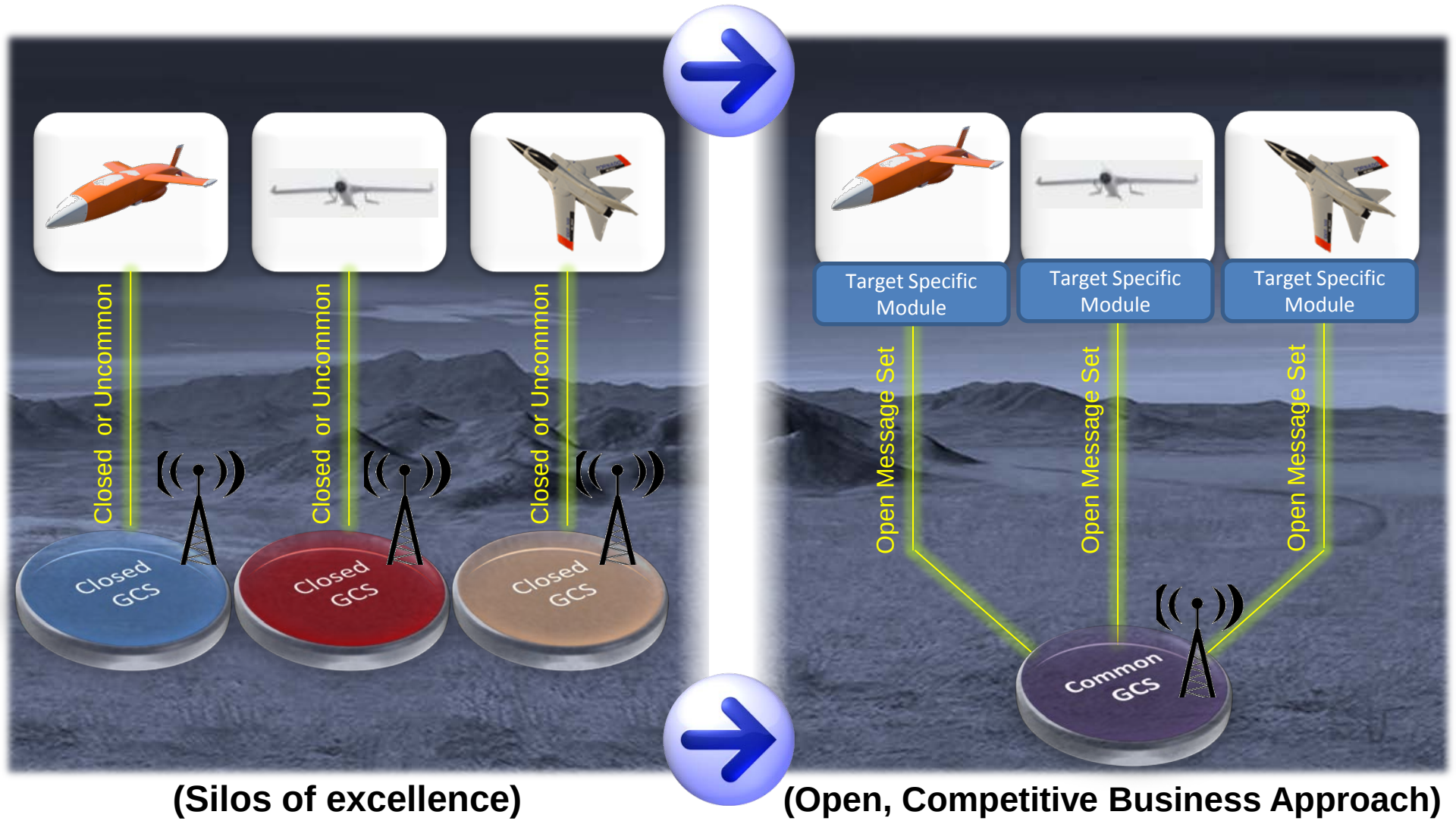


Best-of-Breed GCS with competed services and maintainability

Chartered by Joint UAS Task Force Interoperability IPT Technical Society
SAE Operating Rules per Public Law 104-113 (NTTAA) and MB Circular A-119
Program of Work and Operating Rules in DoDAF AV-1
UCS WG includes all PoR Use Cases for development of UAS Standard

Acquisition Opportunities

Standards-based Interconnection..

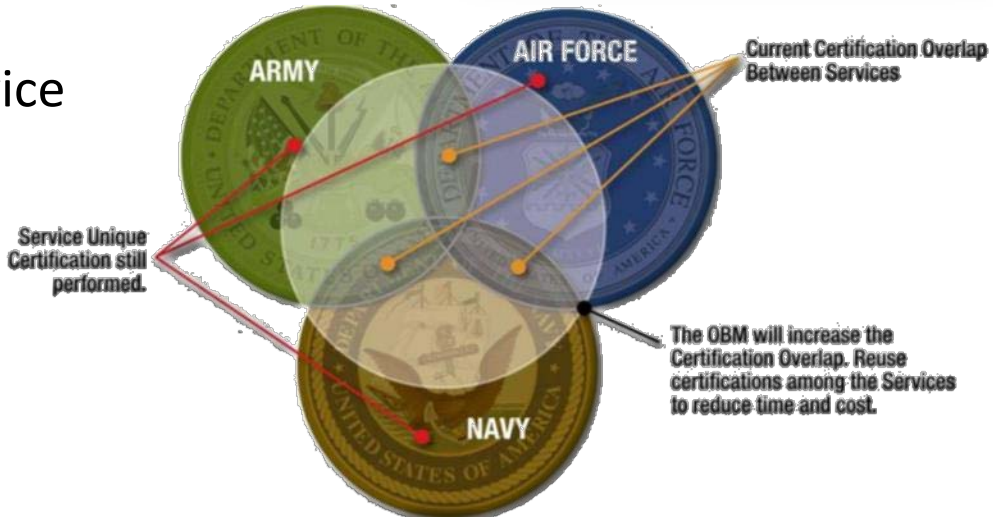


(Silos of excellence)

(Open, Competitive Business Approach)

Summary

- Unmanned Warfare has had continuous scrutiny for portfolio efficiencies
  - Congress/GAO
  - USD(AT&L)
  - UAS Task Force
- Significant efforts is underway within OSD, AT&L focusing on affordability
  - “Should Cost” “Will Cost” of UAS systems
  - Open Business Model (OBM) vision for UAS GCSs
  - Open Architecture – Reuse
  - Remove Redundancy across Service Certification
  - **Reuse verse Start New**

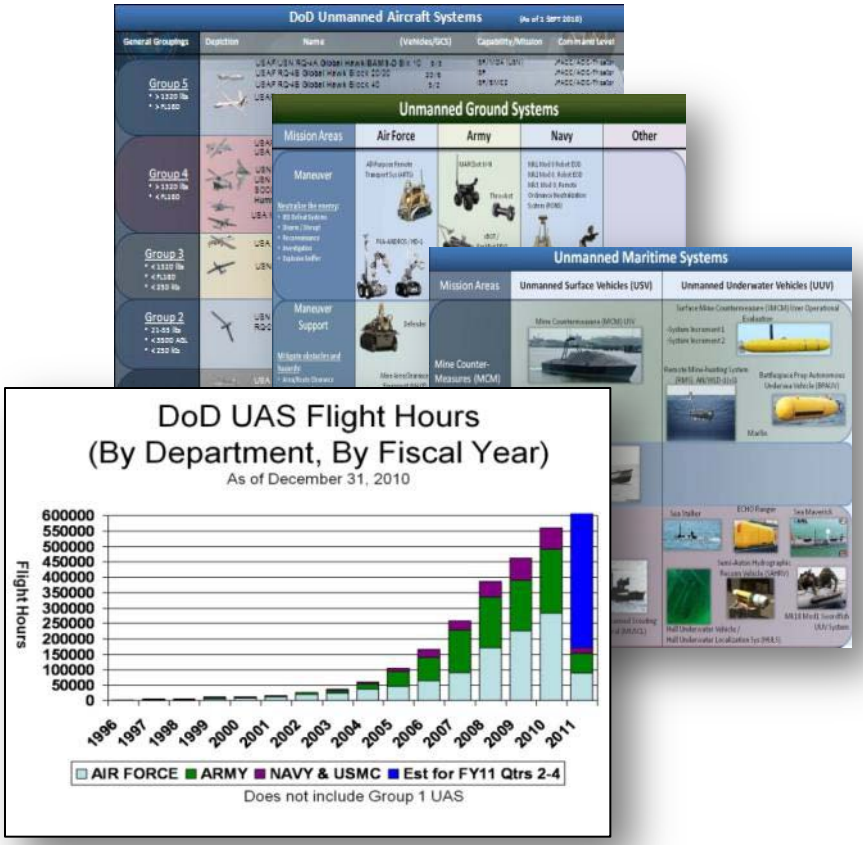


Backups

DoD Unmanned Systems Roadmap

Coordinated 2011-2036 Vision for Services and Industry

- Interoperability
- Autonomy
- Airspace Integration
- Communications
- Training Standardization
- Propulsion and Power
- Manned-unmanned (MUM) Teaming



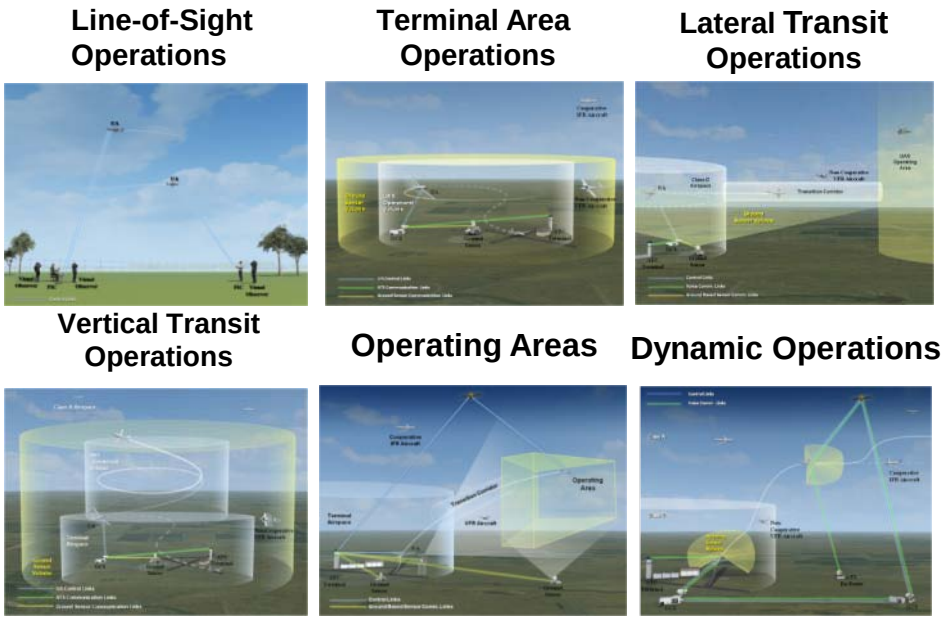
Increased Affordability

2011-2036 Edition planned for 3rd Qtr FY11

Airspace Integration

- Methodology: incremental approach to providing critical access to a given operations profile prior to implementing a full dynamic operations solution.

- Immediate focus: Near-term mission-critical access while simultaneously working toward far-term routine NAS access



NAS Access Requirements

- Aircraft must be Airworthy
- Must be operated by a Qualified Pilot / Operator
- Compliant with Operating Rules, Standards, and Procedures

Vision: Ensure unmanned aircraft have routine access to the appropriate airspace necessary to meet mission requirements

UCS Reference Architecture

UCS-WG ACTIVITIES

Structuring Industry

2009 Concept Exploration

Dec 2009 Version 0.5 Incl. AV-1

Architecture Definition & Demonstration

June 2010 Version 1.0

Nov 2010 IWP Demo
Mar 2011 JSIL Demo

Architecture Modeling (Funded)

June 2011 Version 2.0

Jan **2012** Version 2.1

Enduring Organization

Feb 2009

OUSD/AT&L ADM Published

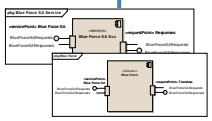
May 2009

UCS Industry Days

Dec 2009

UCS Architecture v0.5 Released

Jun 2010

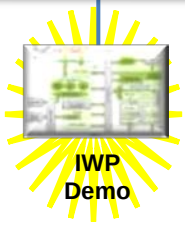


UCS Arch V1.0 Released

Aug 2010

UCS Arch V2.0 Kickoff

Nov 2010



IWP Demo

Jan 2011

Additional OSD Funding

May 2011

UCS Industry Brief

July 2011

UCS Arch V2.0 to Be Released

HMI Study Plan kickoff

Sept 2011

Additional Experiments with 3rd party

Nov 2011

Implementation Structuring

Migration Plan for PoR

Interfaces & Models for all PoR

Jan 2012

UCS Arch V2.1 to Be Released