



Unmanned Systems Roadmap

May 30, 2007

Dyke D. Weatherington
OUSD(AT&L)/PSA/Air Warfare



Outline

- DoD Status Update
- Unmanned Systems Roadmap
- Questions



UAS Planning Task Force

- Established October 2001 at the direction of Under Secretary of Defense for Acquisition, Technology and Logistics (USD(AT&L))
 - To address the need for an integrated Defense wide initiative for UAS planning and execution
 - Provides oversight on all DoD UA acquisition programs
 - Publications released
 - OSD UAS Roadmap (3 editions)
 - UAV Reliability Study
 - Airspace Integration Plan for Unmanned Aviation



Unmanned Systems Funding (RDT&E, Procurement, O&M (\$M))

| <u>UAS</u> | <u>FY07</u> | <u>FY08</u> | <u>FY09</u> | <u>FY10</u> | <u>FY11</u> | <u>FY12</u> | <u>FY13</u> | <u>Total</u> |
|---------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------|
| RDT&E | \$760.8 | \$814.8 | \$1,246.7 | \$1,334.9 | \$1,181.8 | \$859.1 | \$839.5 | \$7,038 |
| Procurement | \$878.4 | \$1,370.3 | \$2,025.1 | \$2,010.5 | \$1,725.7 | \$1,750.8 | \$1,585.7 | \$11,346 |
| O&M | \$590.0 | \$382.9 | \$415.4 | \$479.5 | \$514.5 | \$558.2 | \$610.0 | \$3,551 |
| | | | | | | | | <u>\$21,935</u> |
| <u>UGS</u> | | | | | | | | |
| RDT&E | \$198.2 | \$215.4 | \$199.8 | \$167.5 | \$129.3 | \$58.5 | \$20.0 | \$989 |
| Procurement | \$106.5 | \$39.3 | \$29.7 | \$18.3 | \$17.9 | \$156.3 | \$481.5 | \$849 |
| O&M | \$156.0 | \$5.7 | \$8.8 | \$10.3 | \$11.0 | \$12.1 | \$12.7 | \$217 |
| | | | | | | | | <u>\$2,055</u> |
| <u>UMS</u> | | | | | | | | |
| RDT&E | \$41.5 | \$27.7 | \$44.2 | \$50.9 | \$59.6 | \$68.0 | \$97.5 | \$389 |
| Procurement | \$0.0 | \$0.0 | \$27.6 | \$28.1 | \$72.7 | \$52.8 | \$51.4 | \$233 |
| O&M | \$0.0 | \$0.0 | \$0.0 | \$0.0 | \$0.4 | \$2.1 | \$3.2 | \$6 |
| | | | | | | | | <u>\$628</u> |
| <u>TOTALS</u> | | | | | | | | |
| RDT&E | \$1,000.6 | \$1,057.9 | \$1,490.7 | \$1,553.3 | \$1,370.7 | \$985.7 | \$957.0 | \$8,416 |
| Procurement | \$984.9 | \$1,409.5 | \$2,082.4 | \$2,056.9 | \$1,816.4 | \$1,959.9 | \$2,118.6 | \$12,429 |
| O&M | \$746.1 | \$388.6 | \$424.2 | \$489.8 | \$525.9 | \$572.4 | \$625.9 | \$3,773 |
| <u>Grand Total</u> | \$2,731.5 | \$2,856.0 | \$3,997.3 | \$4,099.9 | \$3,712.9 | \$3,518.0 | \$3,701.5 | \$24,617.1 |



UAS Funding (RDT&E and Procurement)

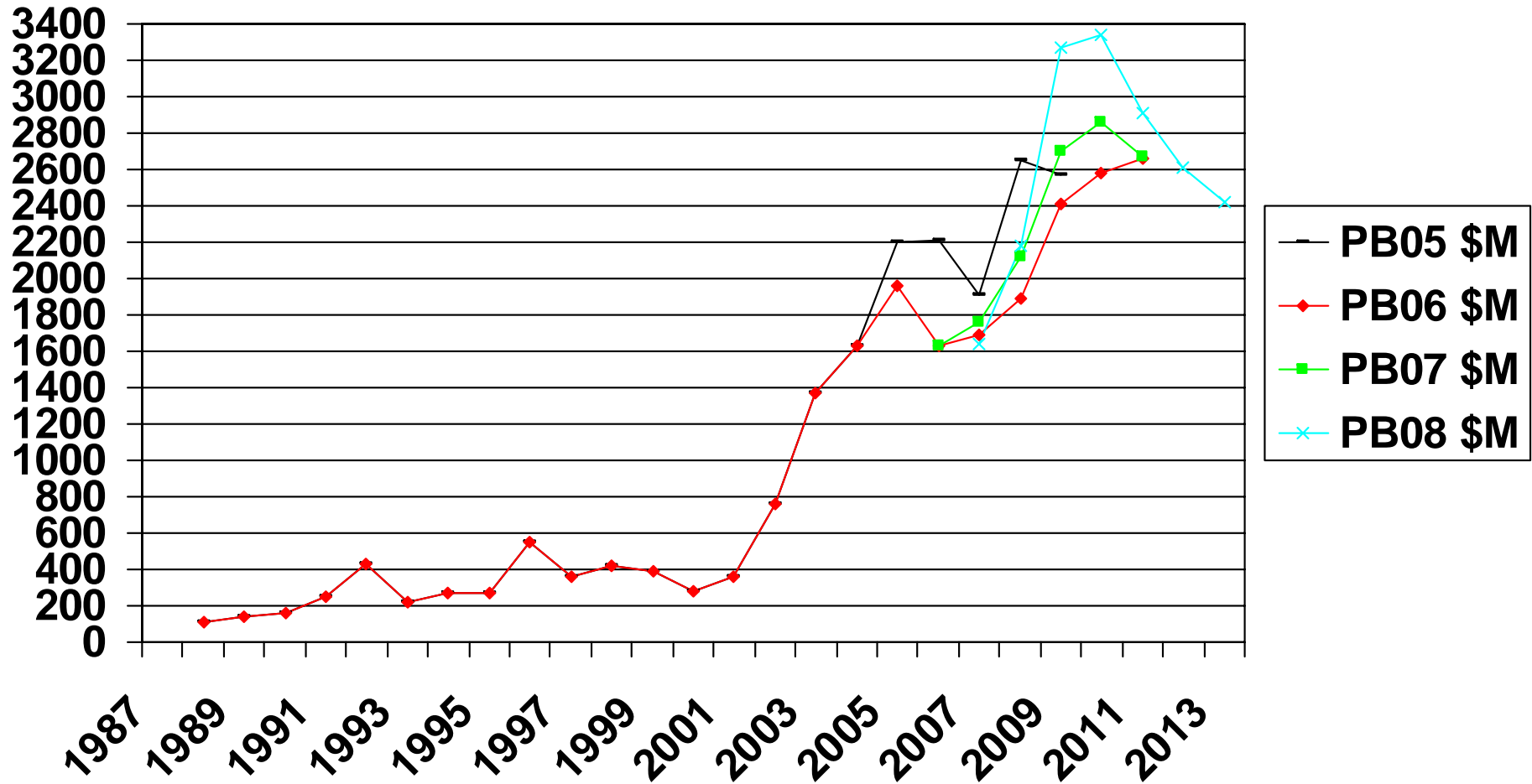
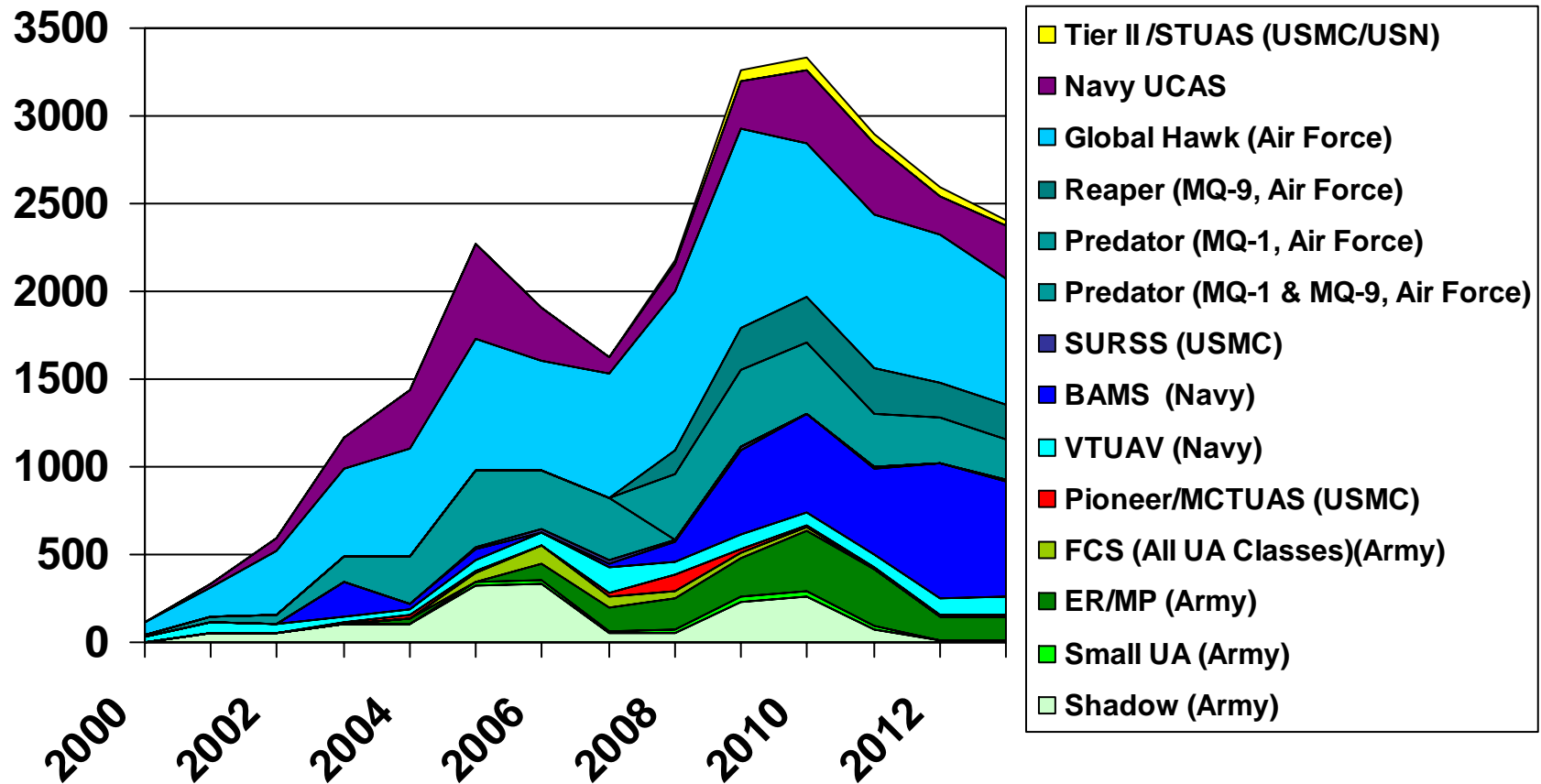


Chart does not include supplement funding



PB08 UAS Funding By Program





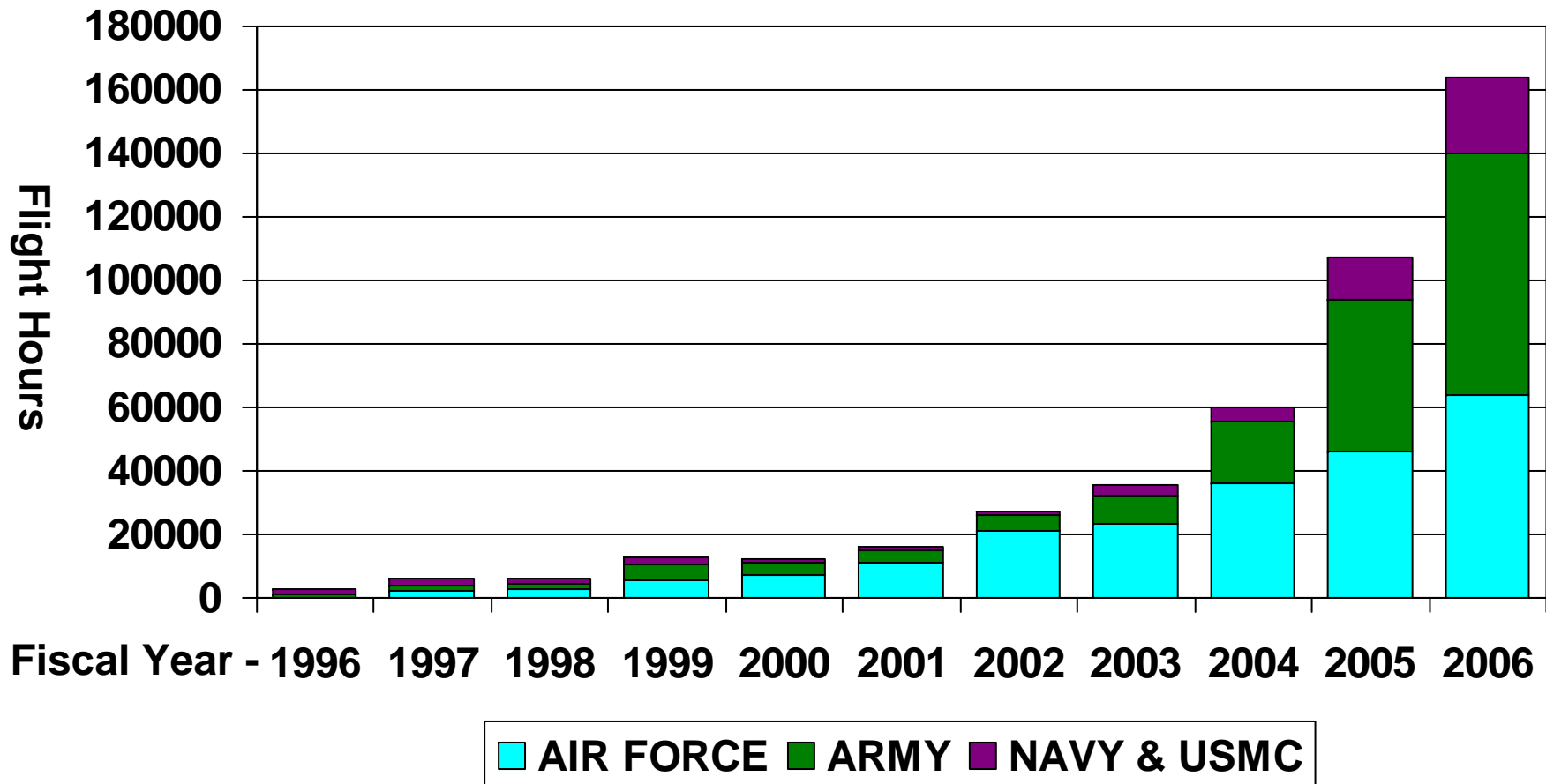
Change in Number of UA (2002 - 2007)

| UAS | # of UAS | | Change in # (2002 - 2007) | UAS | # of UAS | | Change in # (2002 - 2007) |
|---|------------|------------|------------------------------|---|------------|-------------|------------------------------|
| | 2002 | 2007 | | | 2002 | 2007 | |
| Theater & Tactical (> 10 lbs) | | | | Small (< 10 lbs) | | | |
| Buster | | 20 | 20 | Aqua Puma | | 18 | 18 |
| Pioneer | 34 | 33 | -1 | Raven A & B | | 2469 | 2469 |
| Shadow 200 | 24 | 220 | 196 | Dragon Eye | 40 | 705 | 665 |
| Neptune | | 15 | 15 | Desert Hawk | | 96 | 96 |
| Tern | | 15 | 15 | MAV (ACTD) | | 25 | 25 |
| Mako | | 14 | 14 | Swift | | 124 | 124 |
| Tigershark | | 9 | 9 | Sub-Total | 40 | 3437 | 3397 |
| SnowGoose | | 28 | 28 | | | | |
| Hunter | 41 | 54 | 13 | Grand Total | 167 | 3965 | 3798 |
| I-Gnat | | 9 | 9 | Note: Small unmanned aircraft systems (SUAS), those weighing less than 10 lbs and being capable of being hand-launched, have been included. The greatest increase in numbers of aircraft is due to SUAS. SUAS are listed separately. Numbers listed are for aircraft, not systems. Systems are composed of varying numbers of aircraft. | | | |
| Predator | 22 | 90 | 68 | | | | |
| Predator B | | 8 | 8 | | | | |
| Global Hawk - ACTD | 6 | 4 | -2 | | | | |
| Global Hawk - Production | | 7 | 7 | | | | |
| GHMD | 0 | 2 | 2 | | | | |
| Sub-Total | 127 | 528 | 401 | | | | |



DoD UAS Flight Hours

(Does not include Small UAS)





Unmanned Systems Roadmap



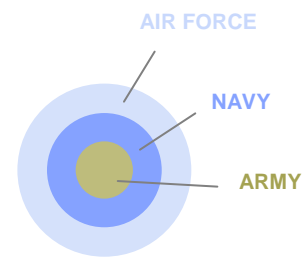
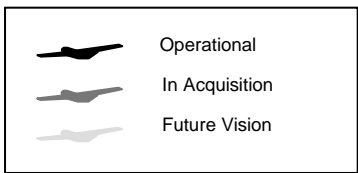
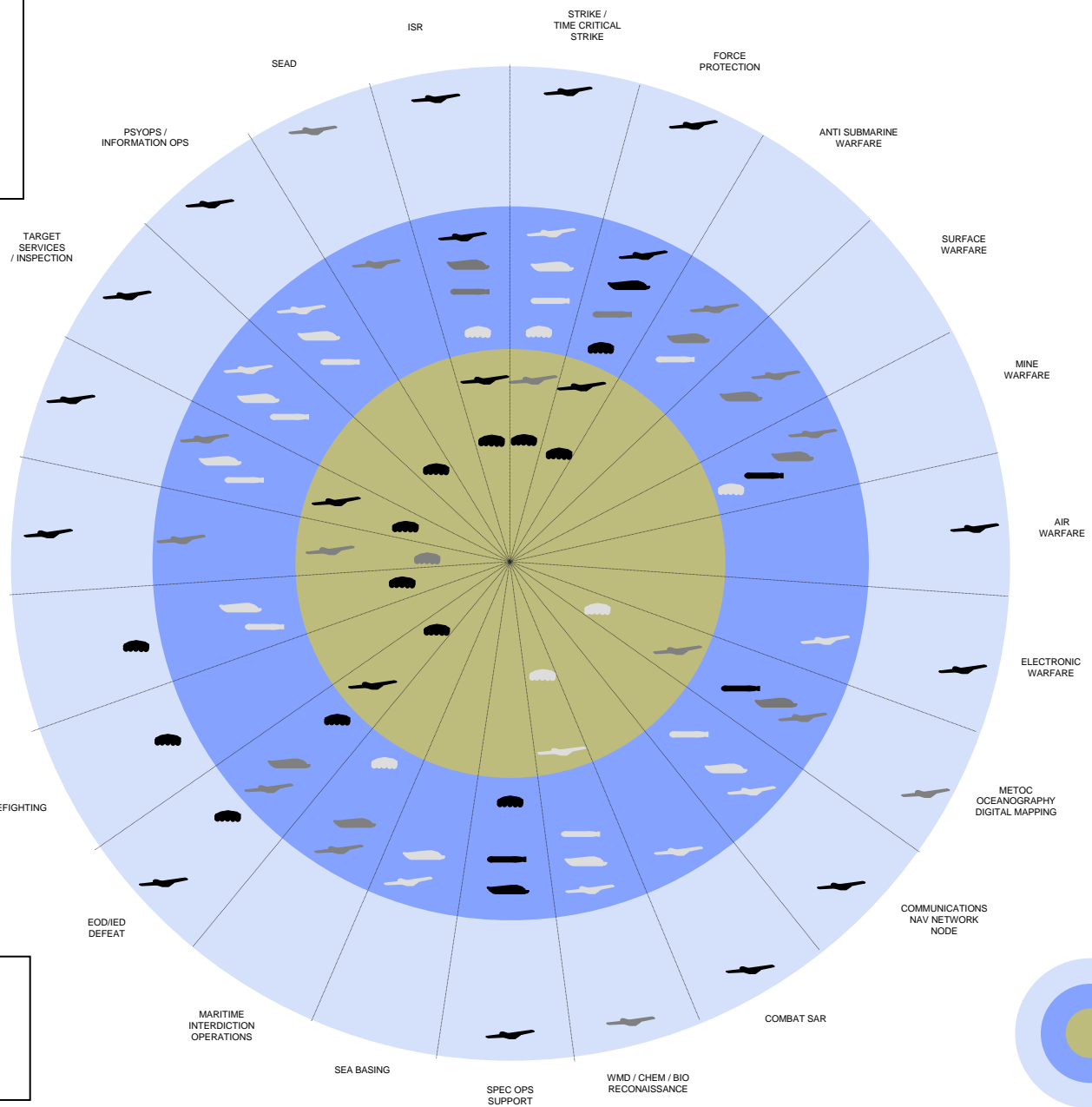
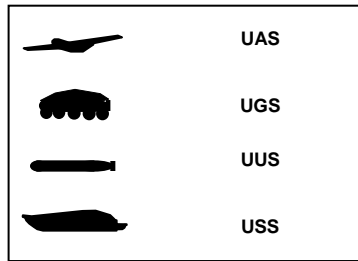
Unmanned Systems Roadmap

- The Unmanned Systems Roadmap spans 2007-2032 and covers Unmanned Aircraft Systems, Unmanned Ground Systems, and Unmanned Maritime Systems.
- Combines existing information from the Office of Secretary of Defense Unmanned Aircraft Systems (UAS) Roadmap (2005-2030), the 2005 Joint Ground Robotics Master Plan, and the 2004 Unmanned Underwater Vehicle Roadmap.
- The long term plan is to publish a truly integrated *Unmanned Systems Roadmap* in 2009 that will focus on all Service systems, air, ground, and sea; their interoperability and how to achieve our future vision.
- Review & Comment Phase suspense - 25 May 07
- Publish date – 31 Aug 07



OSD Application

- The Unmanned Systems Roadmap is *guidance* for the systematic migration of mission capabilities to UMS while addressing the most urgent COCOM mission needs that are supported both technologically and operationally
- The Unmanned Systems Roadmap will not be a budgetary document and will not direct funding of Unmanned Systems nor related technology
 - But it *is* the document we will use to evaluate how well the services and components have implemented the OSD Unmanned Systems vision ...





Top 7 Aircraft Systems Mission Areas

| Mission | Unmanned Aircraft Class | | | |
|---|-------------------------|----------|---------|--------|
| | Small | Tactical | Theater | Combat |
| 1 - Reconnaissance | 1 | 1 | 1 | 1 |
| 2 - Precision Target Location and Designation | 2 | 2 | 2 | 2 |
| 3 - Signals Intel | 7 | 3 | 3 | 4 |
| 4 - Battle Management | 3 | 4 | 5 | 6 |
| 5 - Communications/Data Relay | 8 | 6 | 4 | 7 |
| 6 - Chem/Bio Reconnaissance | 5 | 5 | 9 | 8 |
| 7 - Combat SAR | 4 | 7 | 8 | 9 |

(Prioritized by mission area across unmanned aircraft class)



Top 7 Ground Systems Mission Areas

| Mission | Unmanned Ground Systems | | |
|------------------------------------|-------------------------|-----|-------------|
| | Company | BCT | UA/Division |
| 1 - Reconnaissance | 1 | 1 | 1 |
| 2 - Mine Detection/ Countermine | 2 | 2 | 2 |
| 3 - Prec. Tgt Loc./Designation | 3 | 3 | 5 |
| 4 - Chem/Bio Recon | 4 | 4 | 3 |
| 5 - Weaponization/Strike | 5 | 5 | 6 |
| 6 - Battle Mangement | 7 | 7 | 4 |
| 7 - Signals Intel | 6 | 6 | 7 |

(Prioritized by mission area across unmanned ground systems class)



Top 7 Maritime Systems Mission Areas

| Mission | Unmanned Maritime System Classes | | | |
|----------------------------|----------------------------------|-----|-----|-------|
| | Small | LWT | HWT | Large |
| 1 – ISR | 1 | 1 | 1 | 1 |
| 2 – Inspect/Identification | 2 | 2 | 2 | 2 |
| 3 – Mine Countermeasures | 3 | 3 | 3 | 3 |
| 4 – Payload Delivery | 8 | 7 | 4 | 7 |
| 5 – CBR | 4 | 5 | 8 | 12 |
| 6 – Sensor Insertion | 5 | 4 | 10 | 11 |
| 7 – Littoral USW | 12 | 9 | 5 | 5 |

(Prioritized by mission area across unmanned sea system class)



COCOM/Service Top 7 Unmanned Systems Mission Areas

- 1. Reconnaissance**
- 2. Precision Target Location and Designation**
- 3. Mine Detection/ Countermeasures**
- 4. Signals Intelligence**
- 5. Battle Management**
- 6. Chemical/ Biological Reconnaissance**
- 7. Weaponization**

(Prioritized by mission area across unmanned domain class)



Office of the Secretary of Defense

Unmanned Systems Roadmap, 2007-2032

Format

- Executive Summary
- Chapter 1 – Introduction
- Chapter 2 – Strategic Planning and Policy
- Chapter 3 – Interoperability and Standards
- Chapter 4 – COCOM Mission and Capability Needs
- Chapter 5 – Organizational Efforts
- Chapter 6 – Technologies for Unmanned Systems
- Chapter 7 – International Cooperation

- Annex A – Unmanned Aircraft Systems
- Annex B – Unmanned Ground Systems
- Annex C – Unmanned Maritime Systems
- Annex D – Unmanned Systems POCs
- Annex E – Mission Area Definitions





Questions?