

# Joint Capability Technology Demonstration (JCTD)

## Orion Unmanned Aircraft System JCTD



Operational Manager: USCENTCOM  
Technical Manager: AFRL  
Transition Manager: 303<sup>rd</sup> AESW (P)

# Report Documentation Page

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# Background



- **Program originated under Congressional sponsorship**
  - Orion HALE program initiated through Army SMDC
  - Air Force Research Lab ULE program won in July 2007
- **Orion MALE UAV shaped in response to DDR&E in Oct 2007**
  - Goal of 5 day endurance, 500 lb payload, 15K altitude
- **Orion satisfies Joint Persistent Surveillance requirement**
  - Strong support from OSD AT&L and AS&C
  - Building support from USAF: AFRL, ASC, ACC, SAF/AQ, Air Staff
- **OSD AS&C proposed Orion JCTD for FY10**
  - USCENTCOM as operational sponsor
  - AFRL as technical manager
  - 303<sup>rd</sup> AESW (Wright-Pat) as transitional manager-proposed
- **Orion JCTD well supported by COCOMs**





# Game-Changing Capability



- How will *Orion* change the game?
  - **5-days with 1,000 lb at 15,000 ft**
  - NFOV FMV EO/IR sensor
  - Comms relay (including laser comms)
- Benefits of the *Orion* UAS:
  - Payload flexibility with **open architecture** interfaces
  - Highly autonomous operations
  - Standards compliant GCS
  - Reduced O&M manpower when compared to currently fielded systems
  - Twin certified heavy fuel engines
  - Redundant avionics systems

**- Affordable**  
**- Autonomous**  
**- Modular**  
**- Non-Proprietary**

**JCTD Goal: Prove the Concept!**



# Recent Orion Activity



- Technical achievements:
  - Preliminary Design Review Nov 08
  - Design Limit Load wing test Nov 08
  - Engine certification (EASA) Jan 09
  - Engine acceptance testing Feb 09
  - Auto takeoff and land (ATOL) testing Mar/Apr 09
- Programmatic update:
  - ULE final report delivered to AFRL Feb 09
  - Orion JCTD presented to CRB Mar 09
  - JROC validated May 27, 2009



Auto-land of Surrogate



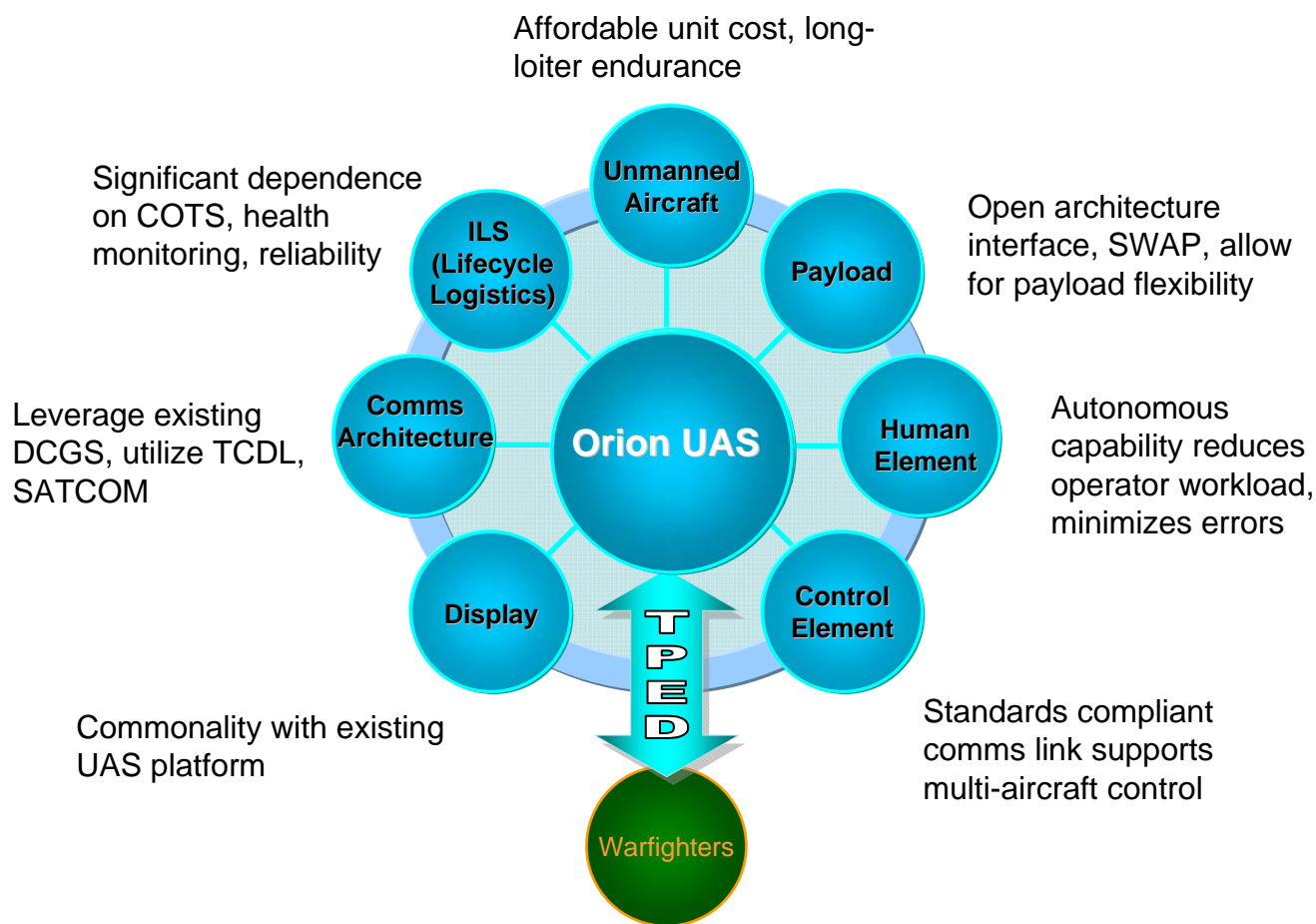
Wing in Design Limit Load test



Acceptance of Austro engine



# Orion System Benefits

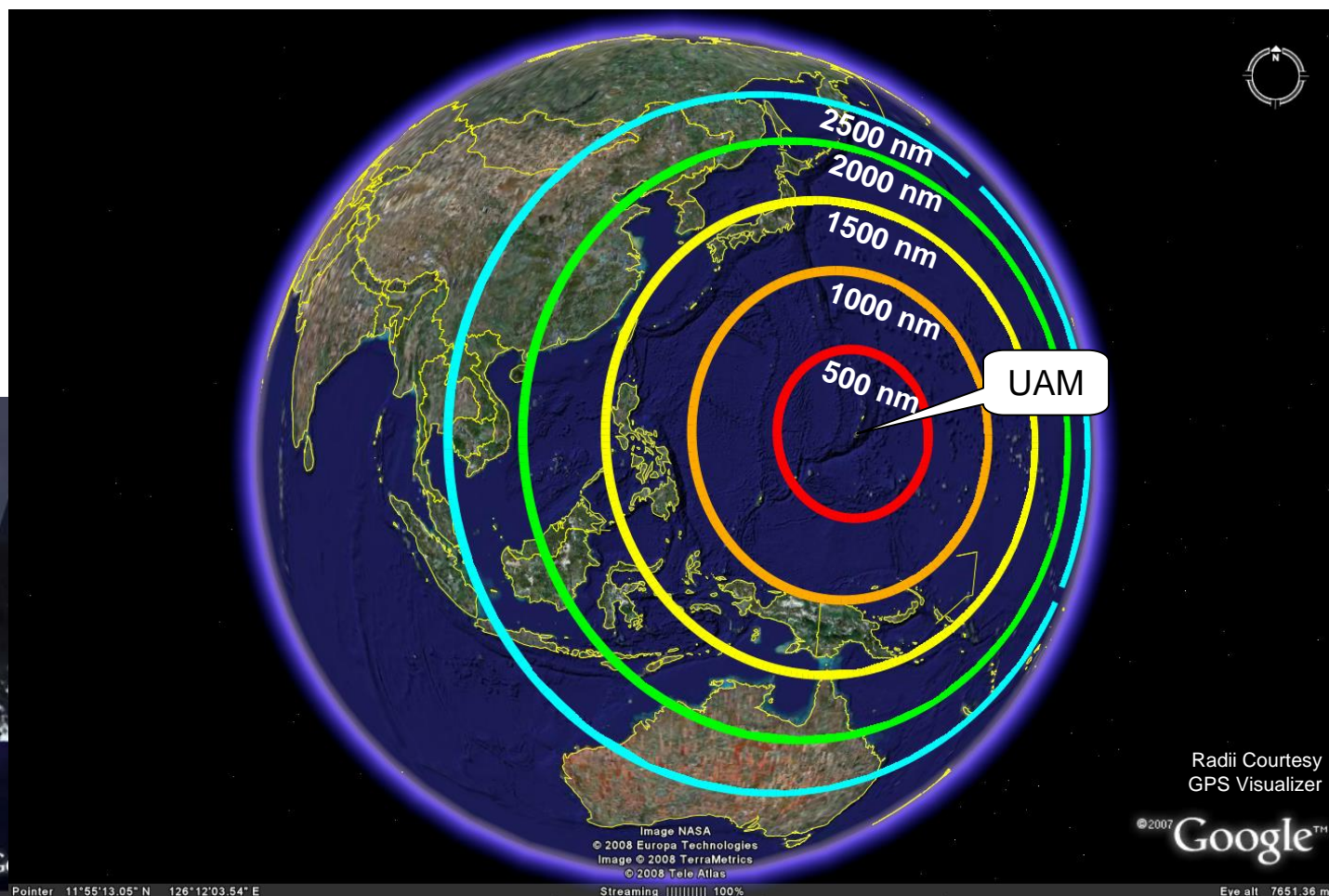




# Loiter Time at Range

- Takeoff and land at Andersen AFB, Guam (UAM)

Range	Loiter Time @ 20,000 ft
500 nm	110 hr
1000 nm	98 hr
1500 nm	84 hr
2000 nm	70 hr
2500 nm	54 hr





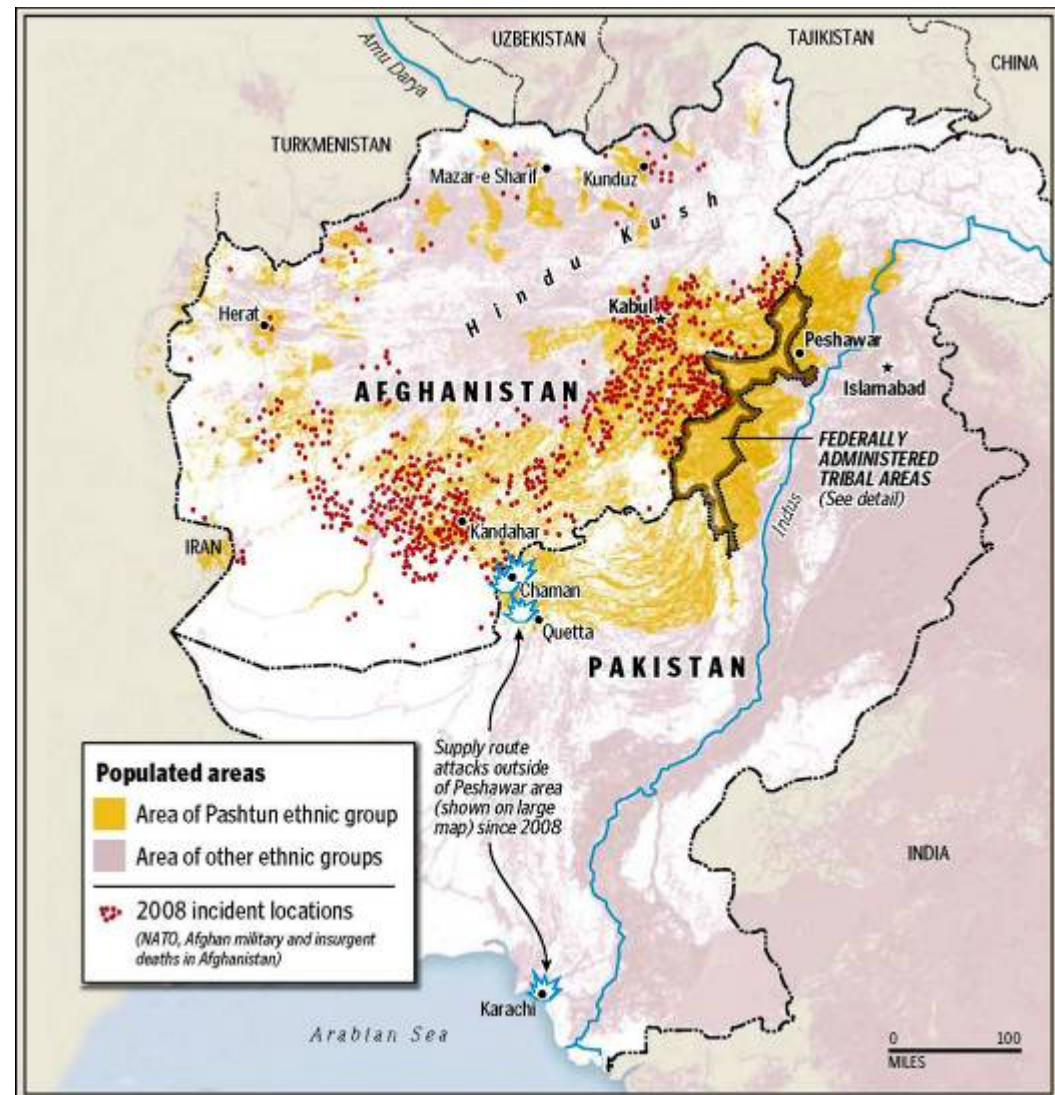
# Orion Available for Afghan Ops



**With Orion's 30,000 ft service ceiling:**

- Orion at 5,000 ft AGL covers 100%
- Orion at 15,000 ft AGL covers 70%
  - Majority of hot-spots

**Purpose built for WAAS, comms relay or supporting "patterns of life" staring**





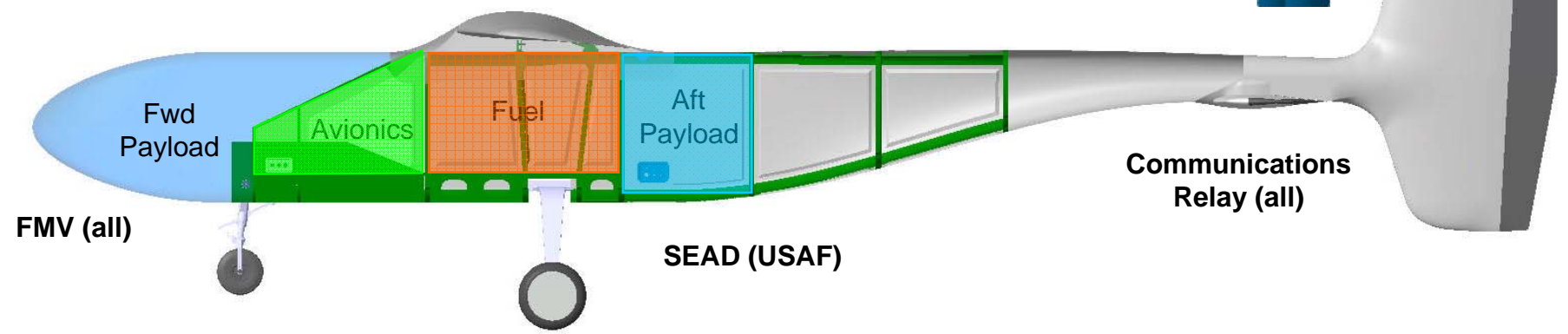
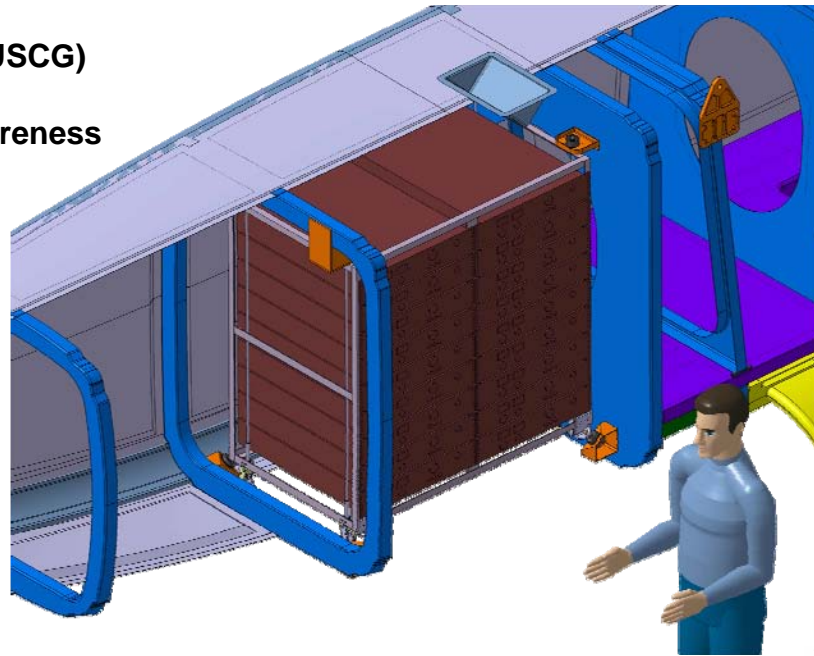
# Modular Payload Bay

**Maritime Radar (USN, USCG)**  
- ASW  
- Maritime Domain Awareness

**SAR/GMTI (USCG, USN)**  
- Semi-submersible  
- Border control  
- Coastal patrol  
- Rescue

**Foliage Penetration (SOF)**

**Gorgon Stare (USAF, USMC, USA)**



**Enables Service-unique payloads**



# Orion JCTD

## Addressing USAF Irregular Warfare Capabilities



### The Value of Air Force Capabilities in IW

- Less Intrusiveness
- Rapid Response
- **Improved Strategic, Operational, and Tactical Situational Awareness**
- **Space Assets: ISR, Precision Nav, Comm, & Weather**

**Less Intrusive**  
**Small Footprint**  
**Low Risk of Casualties**

**Swift Response**

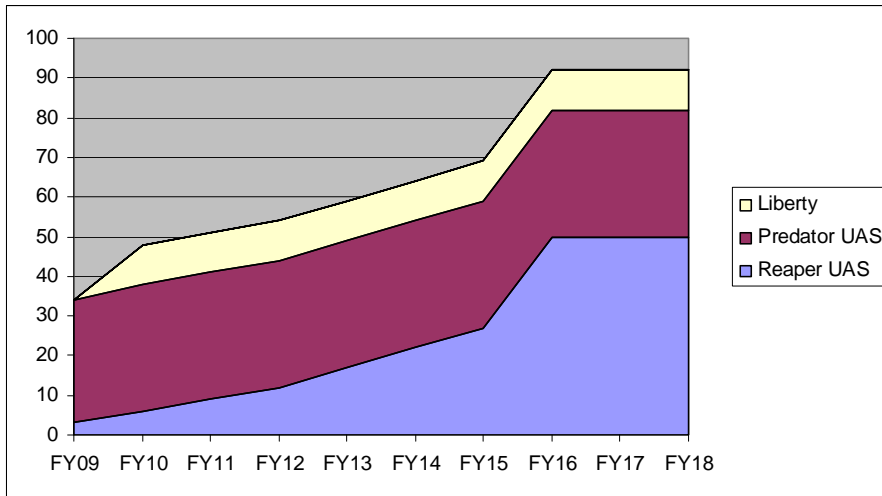
**Speed Range of Aircraft and Cyber Attack Fleeting Targets**

**Global Awareness**

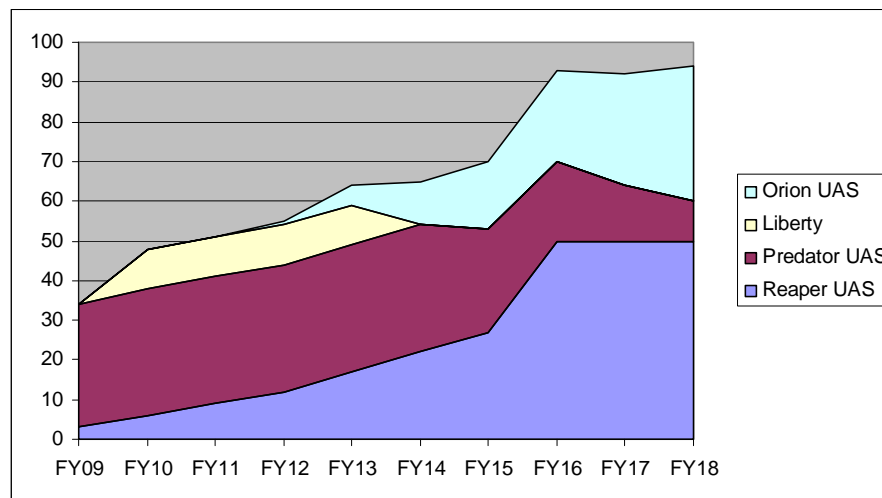
**Actionable Intelligence**  
**Persistent Overwatch**



# Orion Improves CAP Generation



CAPs without Orion



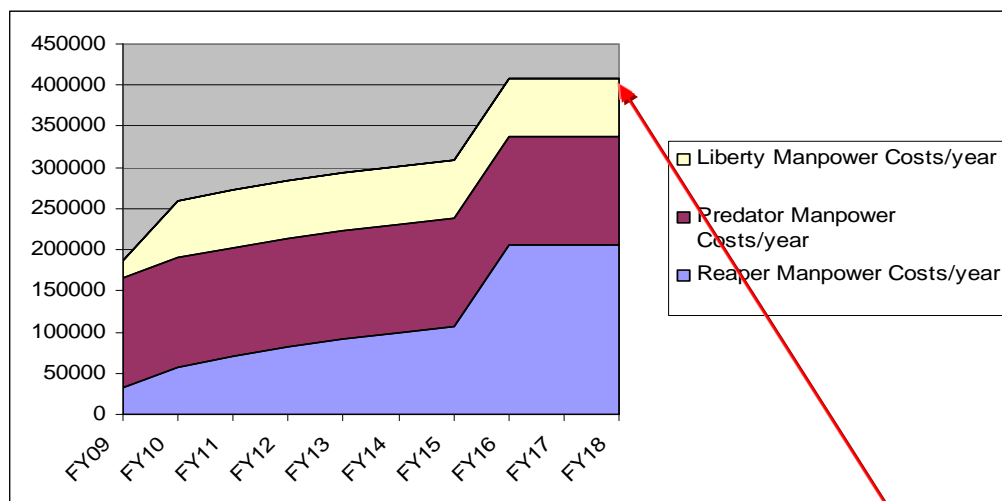
CAPs with Orion

- Orion replaces all Liberty and eventually some of Predator CAPs
- Funding is steady across the FYDP for procurement
- FY10 budget is approved
- No attrition of platforms

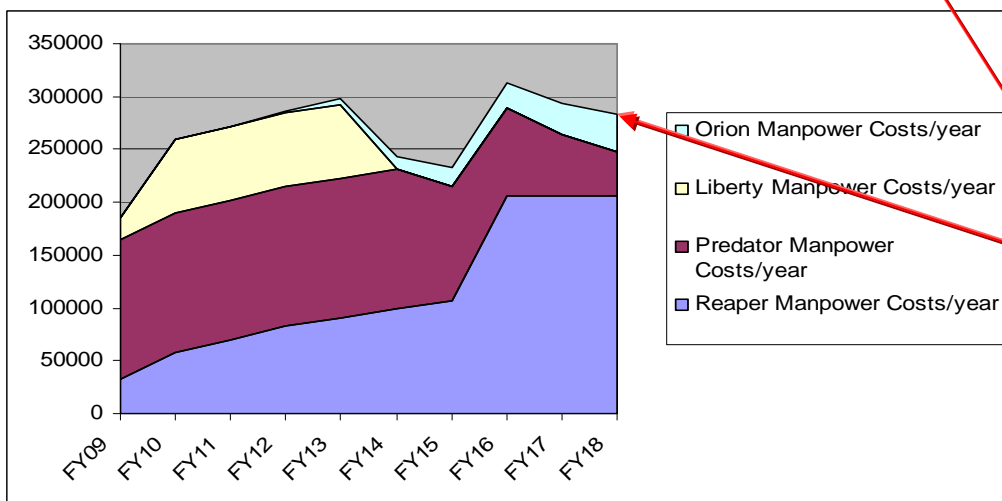
Orion increases CAPs dramatically through FY18



# Orion adds Capability, Reduces O&M



\$M/year without Orion



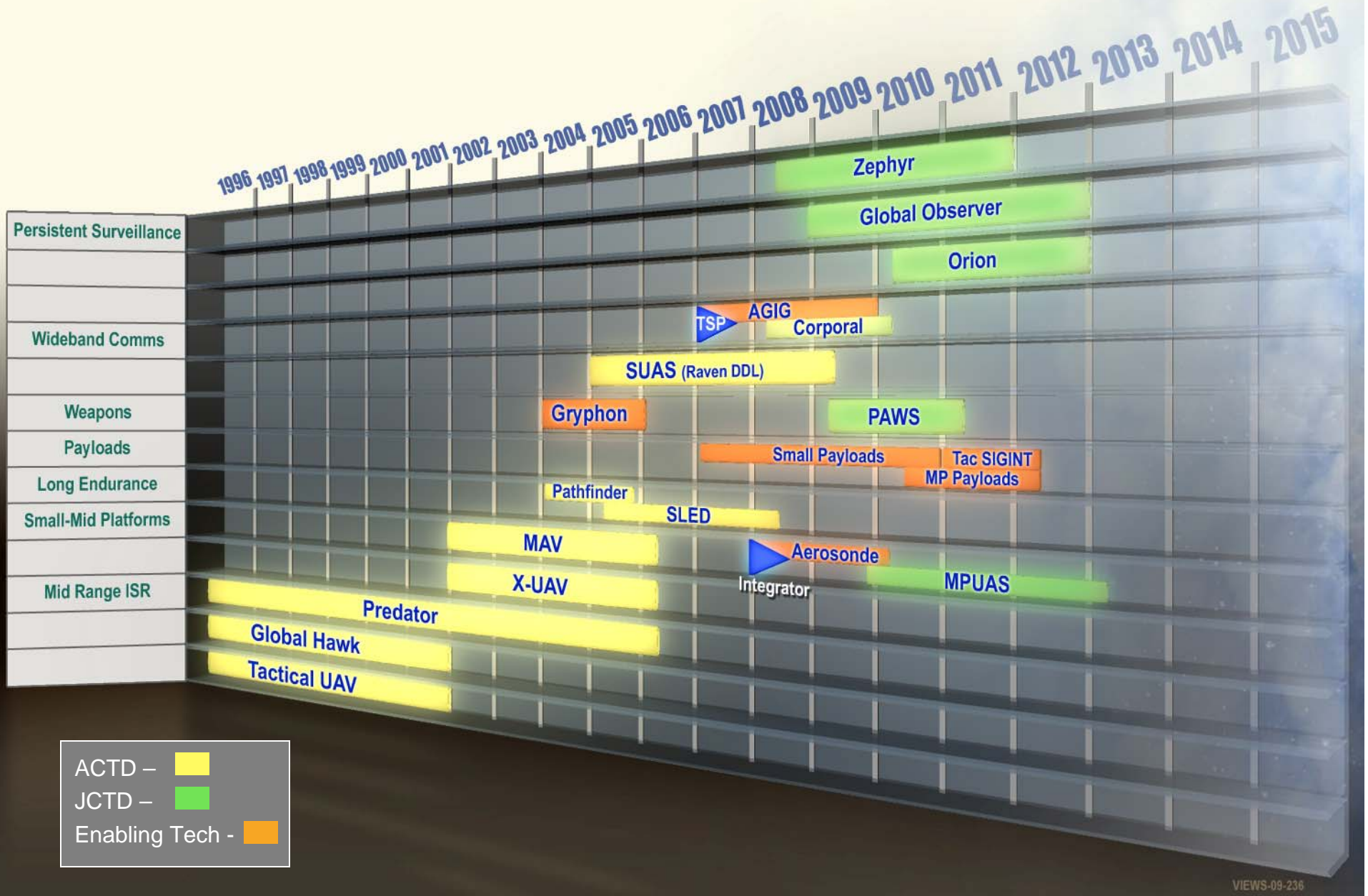
\$M/year with Orion

- Orion at LRIP numbers
- Orion replaces all Liberty and eventually some of Predator CAPs
- Funding is steady across the FYDP for procurement
- FY10 budget is approved
- No attrition of platforms

Orion continues adding CAPs while reducing Manpower costs by \$100M thru FY18!

# A/JCTDs Supporting UAS Development

## OSD/DDR&E/Advanced Systems and Concepts





## Summary



- **Orion UAS leverages 21<sup>st</sup> century technologies to satisfy CENTCOM persistent ISR requirements**
  - 120 hour endurance aircraft with 500-1,000 lb at 15,000-20,000 ft
  - Open architecture enables flexible payloads, future upgrades
- **Several COCOMs interested:**
  - EUCOM
  - AFRICOM
  - SOUTHCOM
  - SOCOM
- **Congressional interest in affordable, Persistent-ISR**

Orion supports OSD and COCOMs with open architecture design, long endurance and competitive prototyping