



Operationally Responsive Space Office

SMC Industry Days

17 Apr 08



Overview

- **What is ORS**
- **Desired End State**
- **ORS Office Near Term**



Why ORS?

- **Increasing reliance on space, emerging global challenges and threats place new demands on our space capabilities**
- **Growing realization that we need new capabilities**
 - Increased flexibility and adaptability to respond to urgent needs
 - Ability to rapidly infuse technological and operational innovation
 - Ability to rapidly augment or reconstitute space systems
- **Congress recognizes importance of ORS**
 - Language in NDAA for FY2007 provided specific guidance to DoD on ORS
 - Directed creation of ORS office
- **Definition: assured space power focused on timely satisfaction of Joint Force Commanders' needs**



Operationally Responsive Space: Four Ideas with the Same Name*

“Operational Level of War vs. Strategic Mission”



- (OPERATIONALLY responsive space (Ors))
- Put combatant commanders in charge

“Change the economics of space”



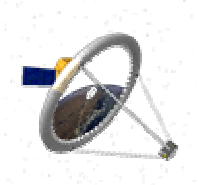
- (operationally RESPONSIVE space (oRs))
- Smaller and simpler satellites in shorter timeframes

“Surge and Replenish”



- (operationally responsive spaceLIFT (ors-L))
- Requires responsive launch and spacecraft

“Technology Push”



- (operationally responsive SPACE (orS))
- Use small satellites to drive technology insertion

* From Dr. S. Huybrechts, OASD(NII), “Thoughts on Space Power in the 21st Century”



ORS Report to Congress: 17 Apr 2007

- **Scopes ORS in a broader context**
 - More than just rapid launch and smallsats
 - Tiered approach to improving responsiveness
- **“ORS Office” vice “ORS Program Office”**
 - More than just an acquisition program office
 - Integrator of ORS efforts throughout the community
- **Concepts and Solutions element added**
 - More than program acquisition function
 - Rapidly identify and assess promising capability options for pressing needs
- **ORS Office at the hub of a larger National Security Space community effort**

Plan signed by the DepSecDef on 20 April 2007



CDR STRATCOM: 7 May 07 Initial CONOPS

- **Commander's Intent:**
 - Enhance & assure the space contribution to joint warfare by enabling timely support to emergent needs of JFCs & other users
- **Three Stated Desires:**
 - Exploit and infuse technological or operational innovation
 - Adapt or augment to expand capability (on demand)
 - Meeting urgent, unforeseen, unfulfilled, or emergent needs
 - Reconstitute or replenish to preserve capability (on demand)
- **Mission Areas**
 - Traditional Space Force Enhancement
 - Space Control
 - Space Support



CDR STRATCOM: 7 May 07 Initial CONOPS

- **Primary purpose of ORS activities**
 - Prepare the elements needed
 - Execute delivery
 - Include anticipatory and reactive pieces
- **Tiered Approach**
 - Tier-1 (employ it)
 - On-demand with existing assets
 - Minutes to hours
 - Tier-2 (launch/deploy it)
 - On-call with ready-to-field assets
 - Days to weeks
 - Tier-3 (develop it)
 - Rapid transition from development to delivery of new or modified capabilities
 - Months (not years)



ORS Defined: 9 Jul 07 DEPSECDEF Memo

- **ORS Definition:**
 - **“Assured space power focused on timely satisfaction of Joint Force Commander’s needs.”**
- **ORS Functions:**
 - **Complement current space capabilities and a means to implement new capabilities**
 - **Highlight timely application of space power in a theater of ops**
 - **Focus on subset of space activities designed to meet JFC’s needs for new, modified, or augmented capabilities**
 - **Provide conceptual framework and new way of thinking for**
 - **Attaining more agile, resilient, and “tailorable” capabilities**
 - **Emphasizing flexibility across full spectrum of DOTMILPF**

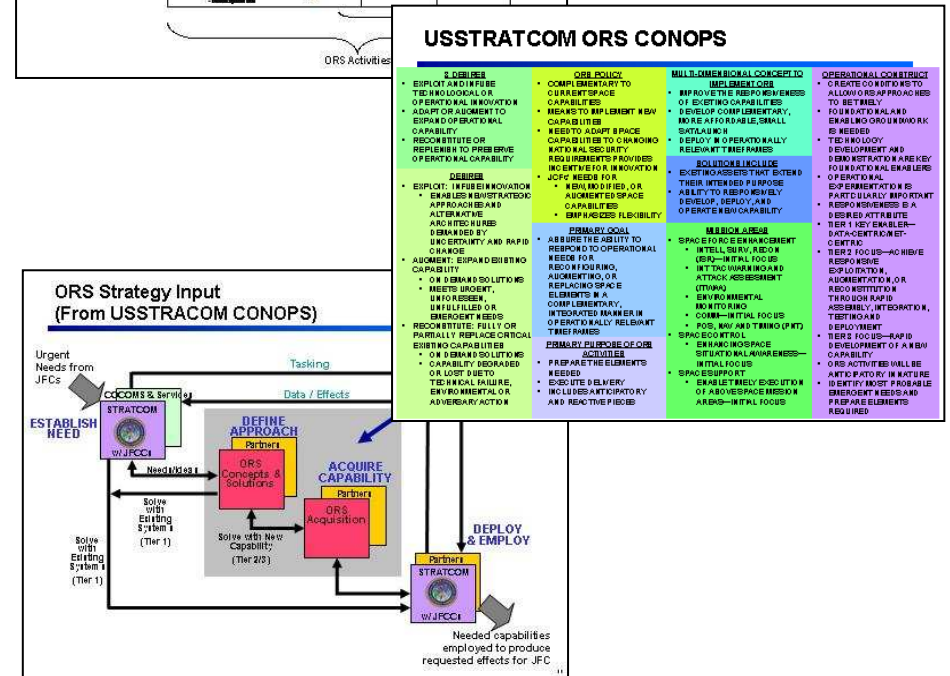
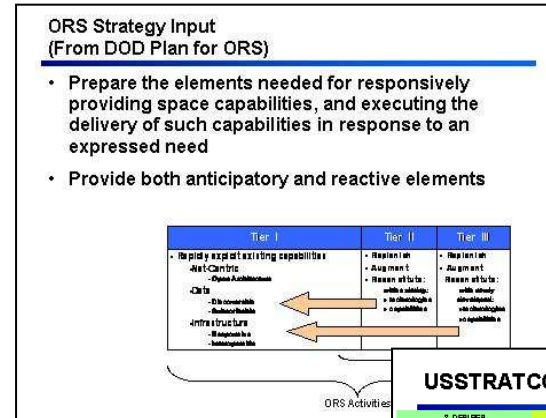


ORS Desired End States



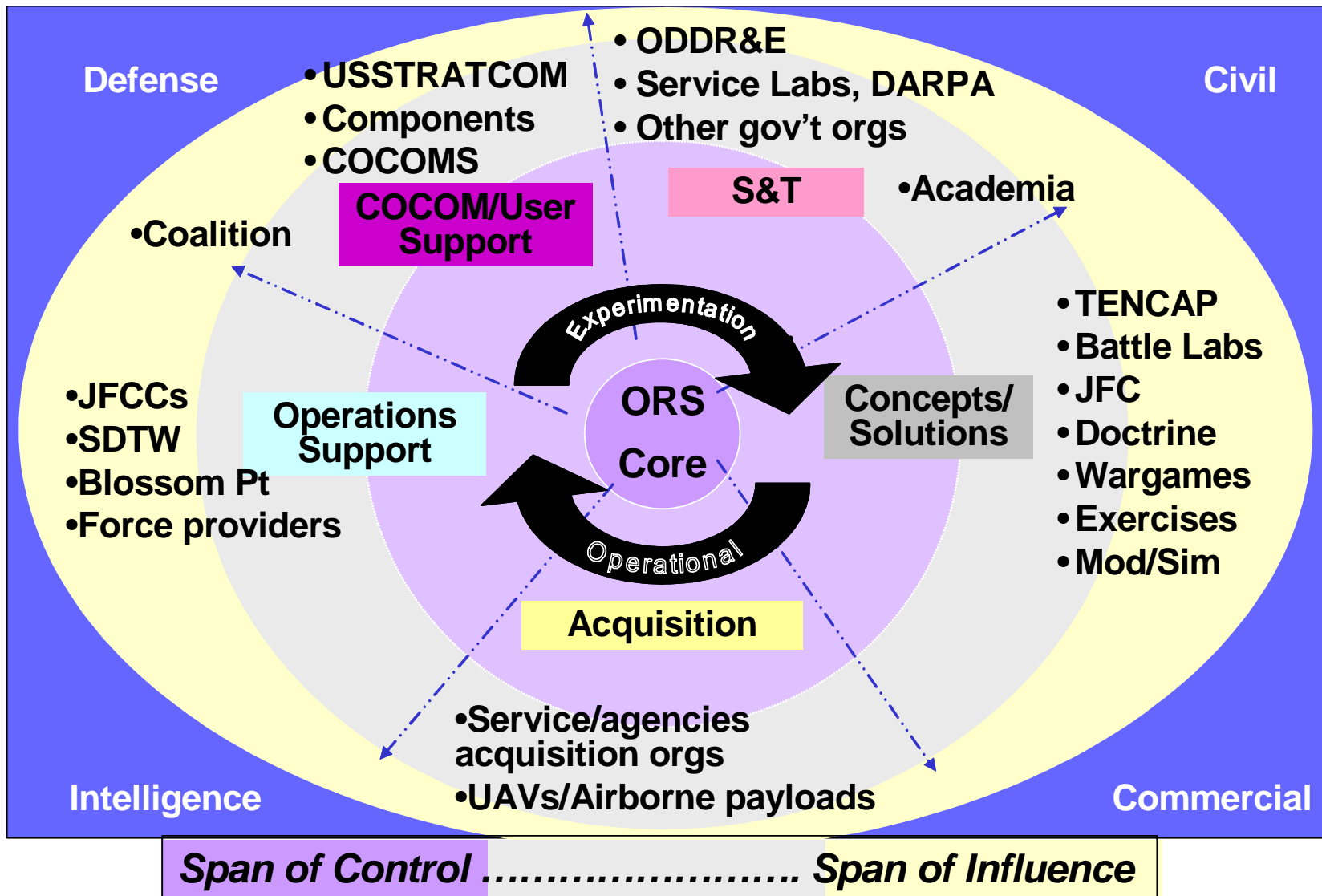
Desired End State: Mature ORS Strategic Framework

- Roadmap to achieve ORS goals
- Strategic Framework helps
 - Prioritize efforts
 - Make best use of available dollars
 - Develop logical, phased approach





Hub and Spoke ORS Community

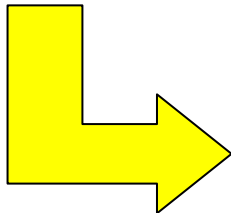




Desired End State: ORS Joint Processes Meeting JFC Needs

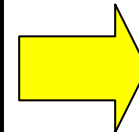
ORS Needs

Gaps / Needs Identified and Prioritized by USSTRATCOM



ORS Approaches

Tier 1	“Employ it”
	On-demand with existing assets Minutes to hours
Tier 2	“Launch/deploy it”
	On-call with ready-to-field assets Days to weeks
Tier 3	“Develop it”
	Rapid transition from development to delivery of new or modified capabilities Months (not years)



ORS Capabilities

Reconstitute lost capabilities

Augment/Surge existing capabilities

Fill Unanticipated Gaps in capabilities

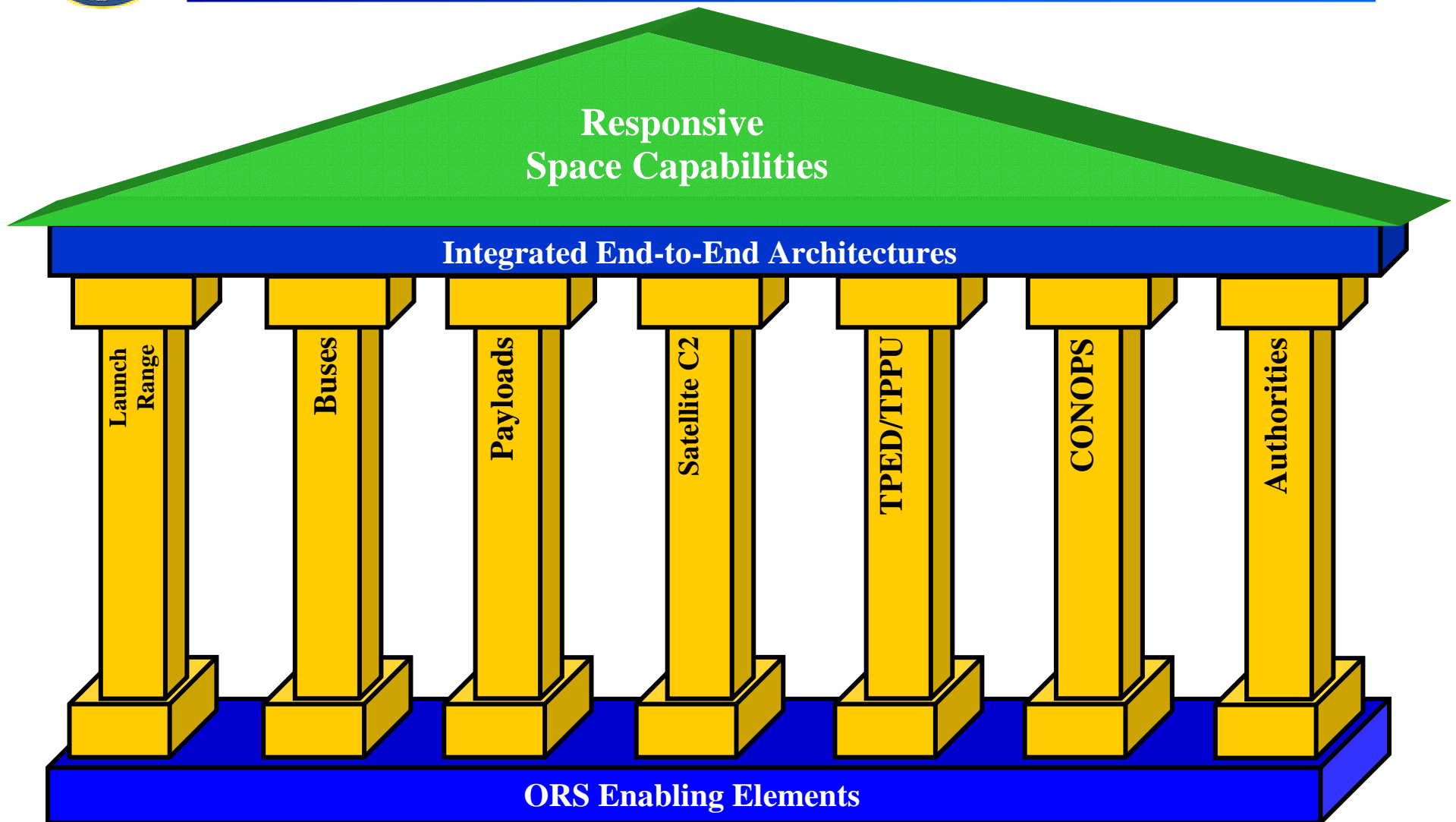
Exploit new technical/operational innovations

Respond to unforeseen or episodic events

Enhance survivability and deterrence



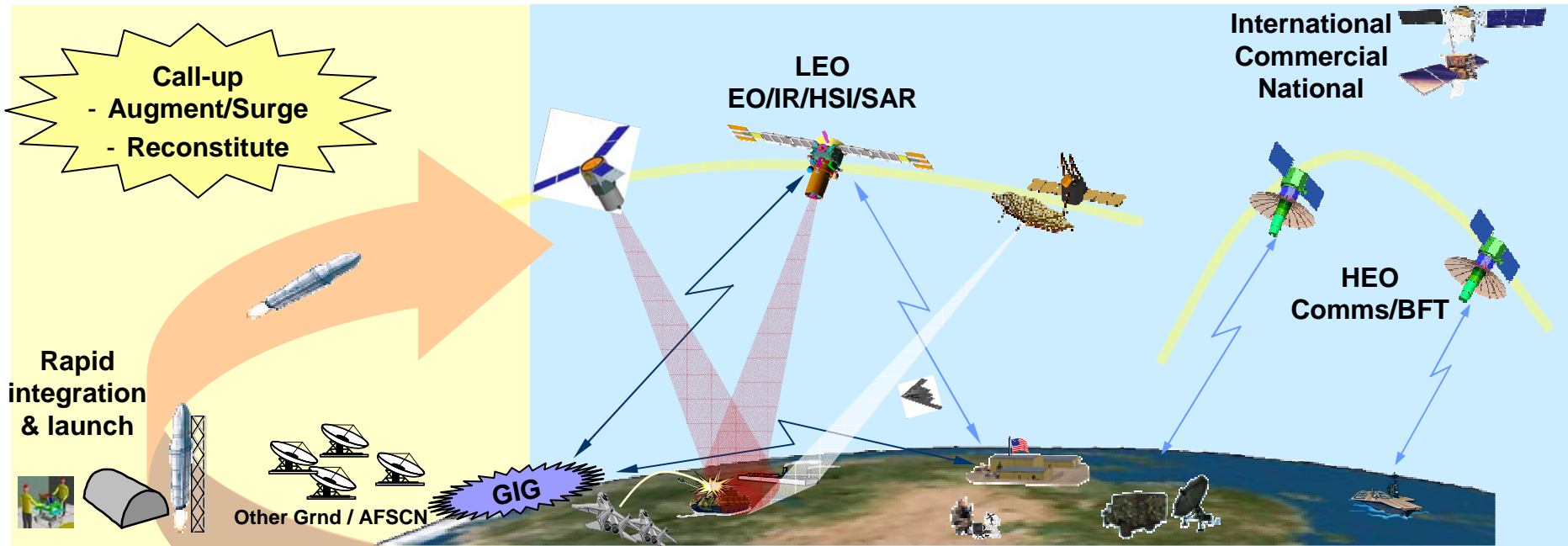
Desired End State: “Run Phase” Capabilities



Services, Agencies, other gov't Organizations, Allies, Industry, and Academia are all key partners in enabling an ORS vision



ORS 2015 End State and Approach



ORS Demonstrators -- Integrated Flight Experiments Tier 1 Demonstrations

Architectural / Standards Guide posts

Responsive Range & Launch Near Term Thrusts

- Minimize Call-up to Launch
- Increase Automation
- Assess Commonality and Standardization
- Improve Specific Range Operations
- Structural Loads Analysis Risk Reduction

Responsive Buses & Payloads Near Term Thrusts

- Modular Payload Architecture and standards
- Modular RF and EO Payload Technology Development
- Rapid Assembly, Test and Integration Concepts for rapid call-up to launch

Multi-Mission Modular Spacecraft Near Term Thrusts

- Common core of optical payload and bus elements
- Rapidly replaceable/modifiable elements
- Base on non-proprietary industry standards



ORS Near Term



First Steps

- **Reach critical mass in ORS Office**
 - **Manning, I-Plan, Service/Agency supporting relationships**
- **Develop initial ORS Strategic Framework**
 - **Identify and prioritize urgent warfighter needs**
 - **Define and prioritize long-term enabling needs for ORS**
- **Develop initial ORS processes to respond to urgent JFC needs**
 - **Joint, transparent, rapid, agile, and repeatable**
 - **Must deliver end-to-end, sustained warfighting capability**
- **Develop ORS “Tier Readiness” roadmaps**
 - **Tier 1, 2, and 3 plans of action**
 - **Integrate and coordinate S&T, Experiments, Demos**
- **Educate ORS stakeholders throughout the defense, intel, civil, industry, academia, and international partners**



ORS Mission Essential Tasks

- 1. Develop end-to-end ORS enablers required to meet the nation's strategic need for highly responsive space capabilities:**
 - Space launch vehicles and supporting range operations
 - Satellite payloads and busses
 - Satellite telemetry, tracking, command and control
 - Satellite payload tasking and sensor data processing, exploitation and dissemination
 - Responsive space CONOPS
 - Authorities necessary for achieving ORS objectives
- 2. Execute rapid end-to-end capability efforts to meet urgent operational needs of Joint Force Commanders**
 - Augment, reconstitute or implement new capability
 - Complementary to fielded space capabilities
 - Coordinated ORS planning, acquisition and operations across DoD



ORS Key Operating Principles

- Short, narrow chain of command
 - Reports directly to DoD EA for Space for all program execution activities
- Centralized Control, Decentralized Execution
 - Follows the “Big Sign, Little Office” model
- Best Athlete Execution
 - Execution activities assigned to the “organize, train, and equip” organization best suited to conduct the mission
- A Strategic Capability
 - Exploit & infuse space technological/operational innovation in drastically reduced timelines to maintain and increase US asymmetric advantage
- Funding Stability
 - Required funding levels determined by the DoD EA for Space
- Small, Handpicked Team
 - Entire ORS effort will be based on small, streamlined government and industry teams, empowered to execute a difficult mission
- Waivers to and Deviations from any encumbering practices, procedures, policies, directives, or regulations
 - However, under no circumstances is the ORS Office authorized to deviate from or otherwise waive public law or executive order



Summary

- **Substantial progress made since ORS Office was established on 21 May 07**
- **ORS Office rapidly responding to numerous tasks despite slow progress in office staffing**
 - Community is very supportive
- **Converging on the balanced strategy and near term plans to address Tier readiness and respond to urgent needs**
- **Detailed ORS Implementation Plan nearing completion and coordination for DepSecDef approval**

ORS Office overall responsible and drives all phases of the effort



Points of Contact

ORS Office:

LTC Jim Pruneski (USA)
Deputy Director, ORS Office
DSN 246-0623, Commercial 505-846-0623
james.pruneski@kirtland.af.mil

Space Development and Test Wing:

Lt Col Jim Kubinski (USAF)
Chief, SDTW Plans and Policy
DSN 263-0019, Commercial 505-853-0019
james.kubinski@kirtland.af.mil



Space and Missile Systems Center Industry Days

Lean Practices Supporting Responsive Space

LtCol John Seamon

Director of Contracting

Space Development and Test Wing (SDTW)

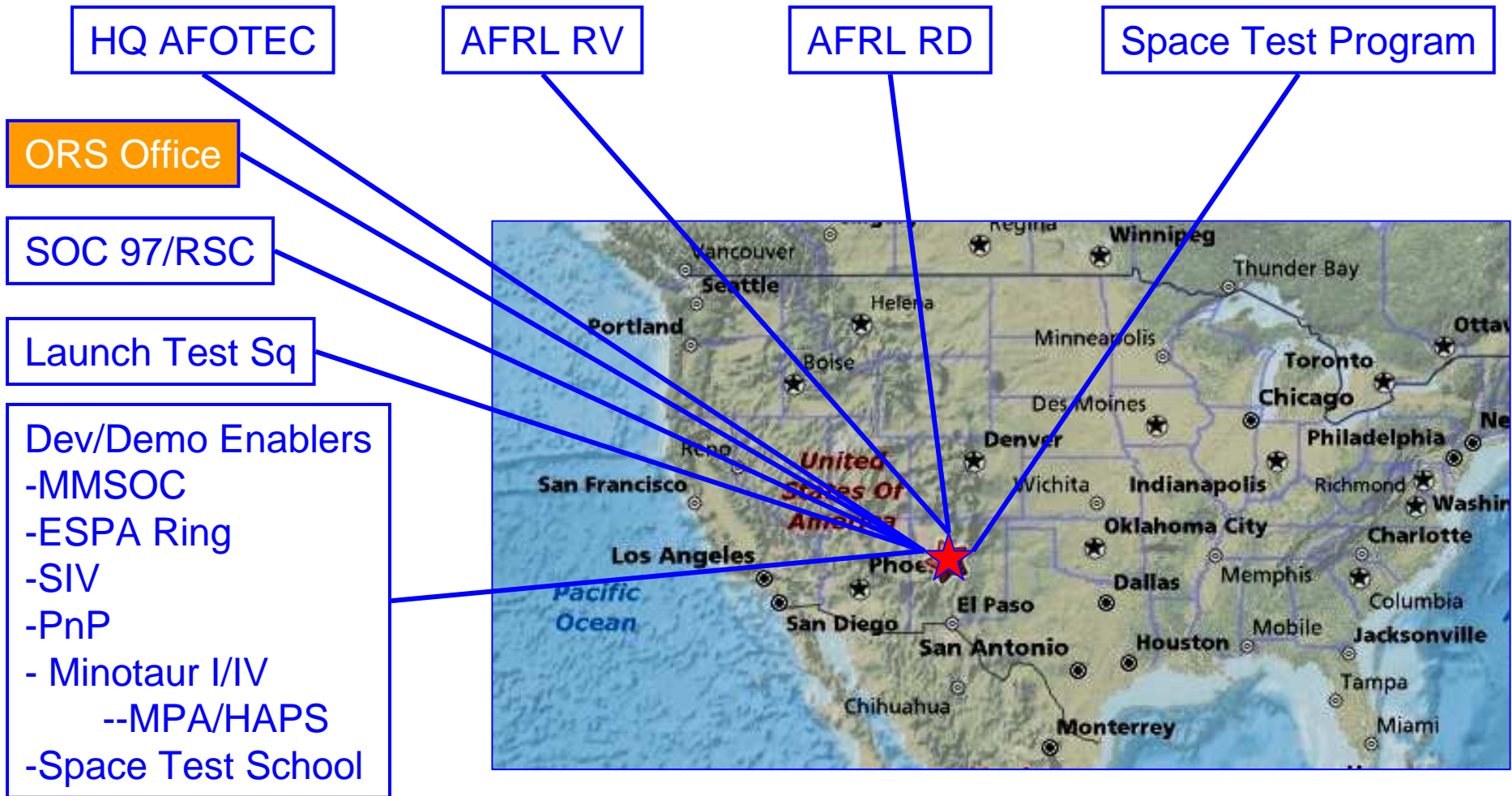


Lean and Responsive

- **Location**
- **Organization**
- **Enablers**



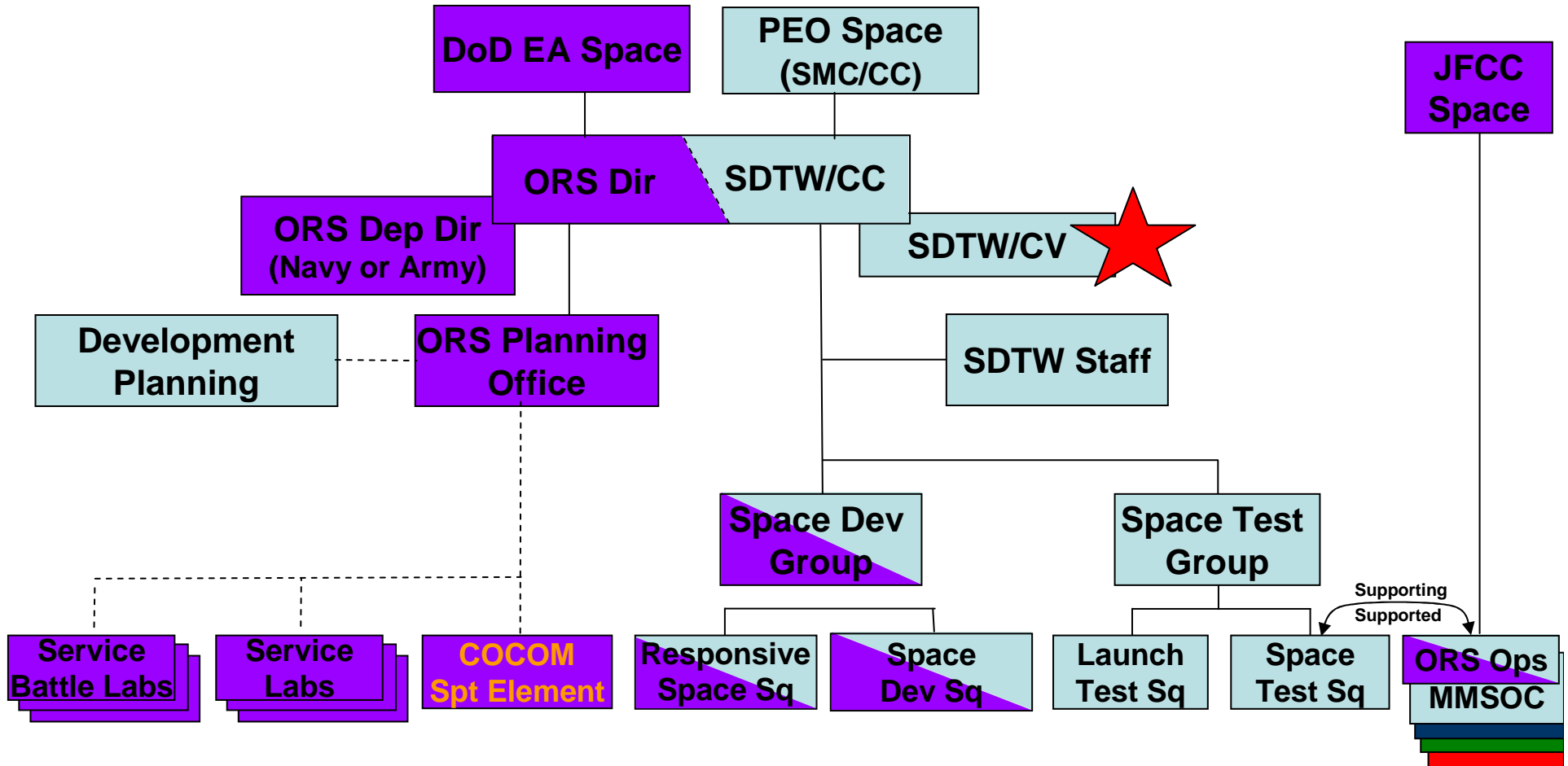
Why Kirtland AFB for Responsive Space Office?



ORS Enablers Jumpstarted by Kirtland R&D Community



Outline: ORS and SDTW





ORS Office Mission Essential Tasks

1. Develop end-to-end ORS enablers

- Low-cost space launch vehicles and supporting range operations
- Responsive satellite payloads and busses
- Satellite telemetry, tracking, command and control
- Satellite payload tasking and sensor data processing, exploitation and dissemination
- Responsive space CONOPS
- Authorities necessary for achieving ORS objectives

2. Execute rapid end-to-end capability efforts to meet urgent operational needs of Joint Force Commanders

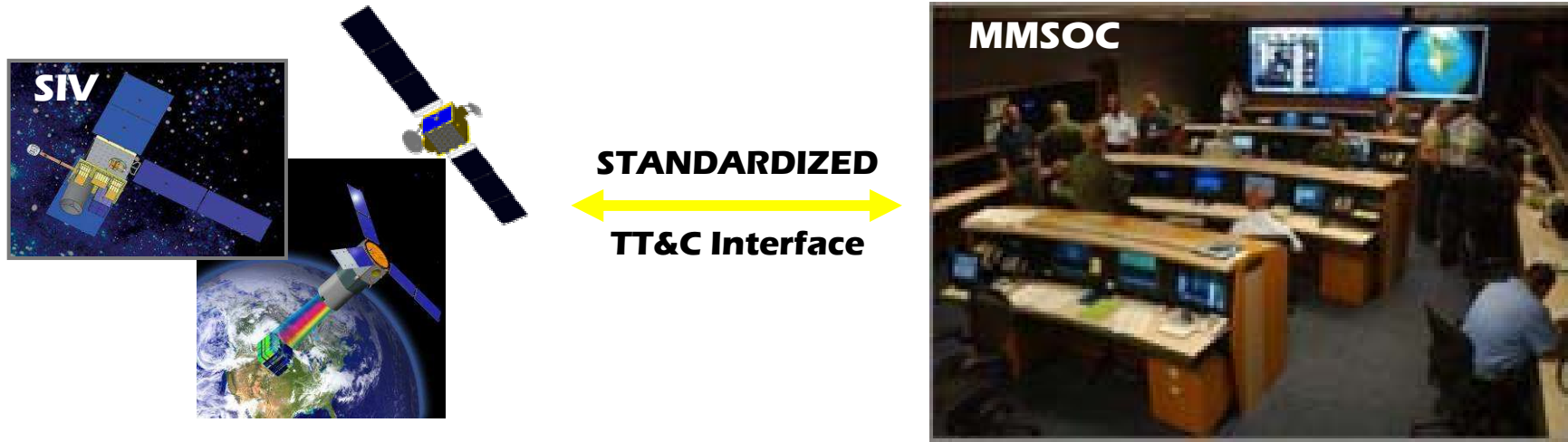
- Augment, reconstitute or implement new capability
- Complementary to fielded space capabilities
- Coordinate ORS planning, acquisition and operations across DoD

SDTW is already developing many enablers for R&D systems



Space Access Initiatives

Multi-mission SOC

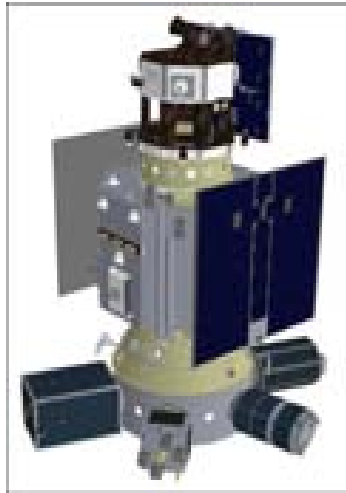


- **Goal: provide standard TT&C interface for R&D and ORS space systems**
 - COTS based system employing a service oriented architecture
 - Reduce mission unique integration requirements
- **MMSOC Program**
 - Seamlessly support multiple mission operations
 - Simplify transition of R&D satellites for real world employment
 - Collaborative partnership among:
 - Operational Units: 50 SW
 - SPO/RDT&E Unit: Space Development and Test Wing
 - Space System Developers and Other Ops Centers
- **Lessons Learned**



Space Access Initiatives

EELV Secondary Payload Adapter

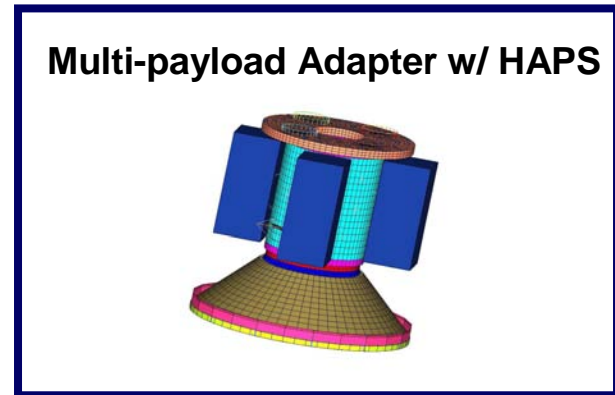
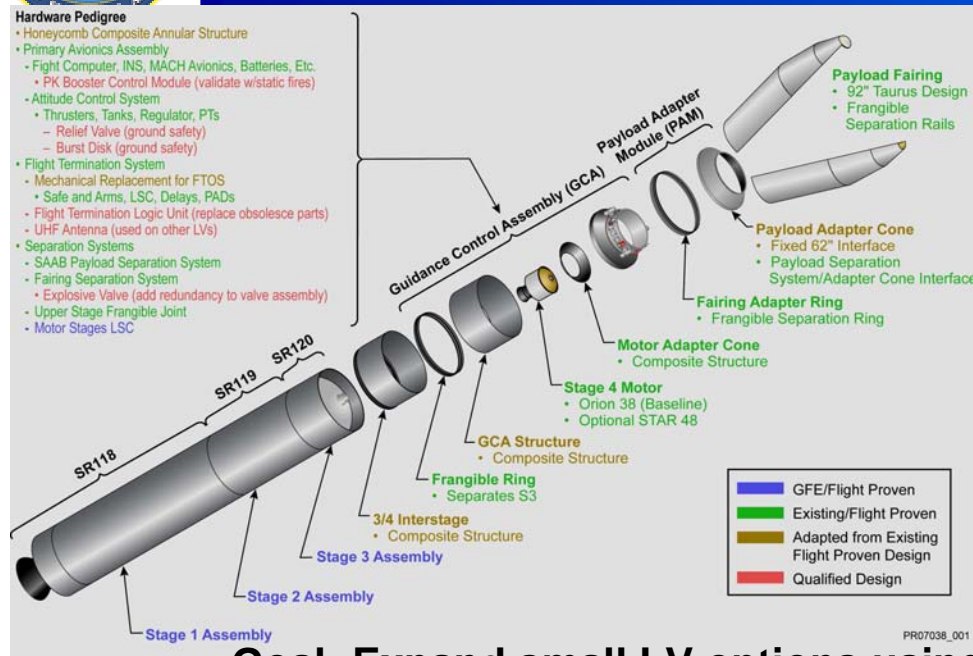


- **Goal: Leverage excess EELV capacity to provide affordable launch for small payloads**
- **ESPA is the US's first "normalized" secondary payload capability**
 - Fits any EELV-M
 - Prime payload interface the same
 - Holds up to six 400lb satellites
 - First flight on STP-1
- **Lessons Learned**



Space Access Initiatives

Minotaur IV Launch Vehicle/Multi-payload Adapter

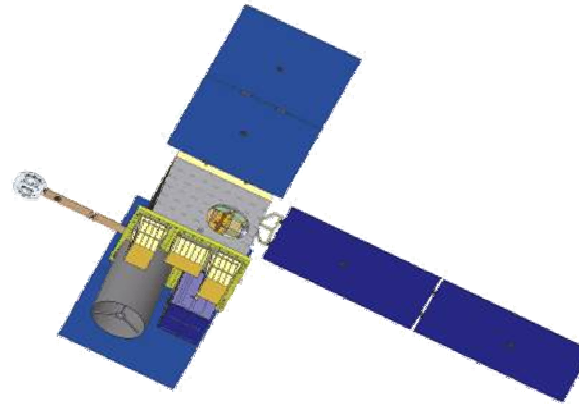


- **Goal: Expand small LV options using proven low risk approaches**
- **Minotaur IV Launch Vehicle**
 - Utilizes Peacekeeper rocket motors to reduce launch costs
 - 3800 lbm to 100nm @ 28.5°, 2200 lbm to 400nm @ s/s
- **Multi-payload Adapter (MPA)**
 - Carries 1-4 ESPA class satellites with multiple PPOD locations
- **Hydrazine Auxiliary Propulsion System (HAPS)**
 - Multiple orbits from single small LV
 - Precise orbit injection
 - Up to 4 payloads



Space Access Initiatives

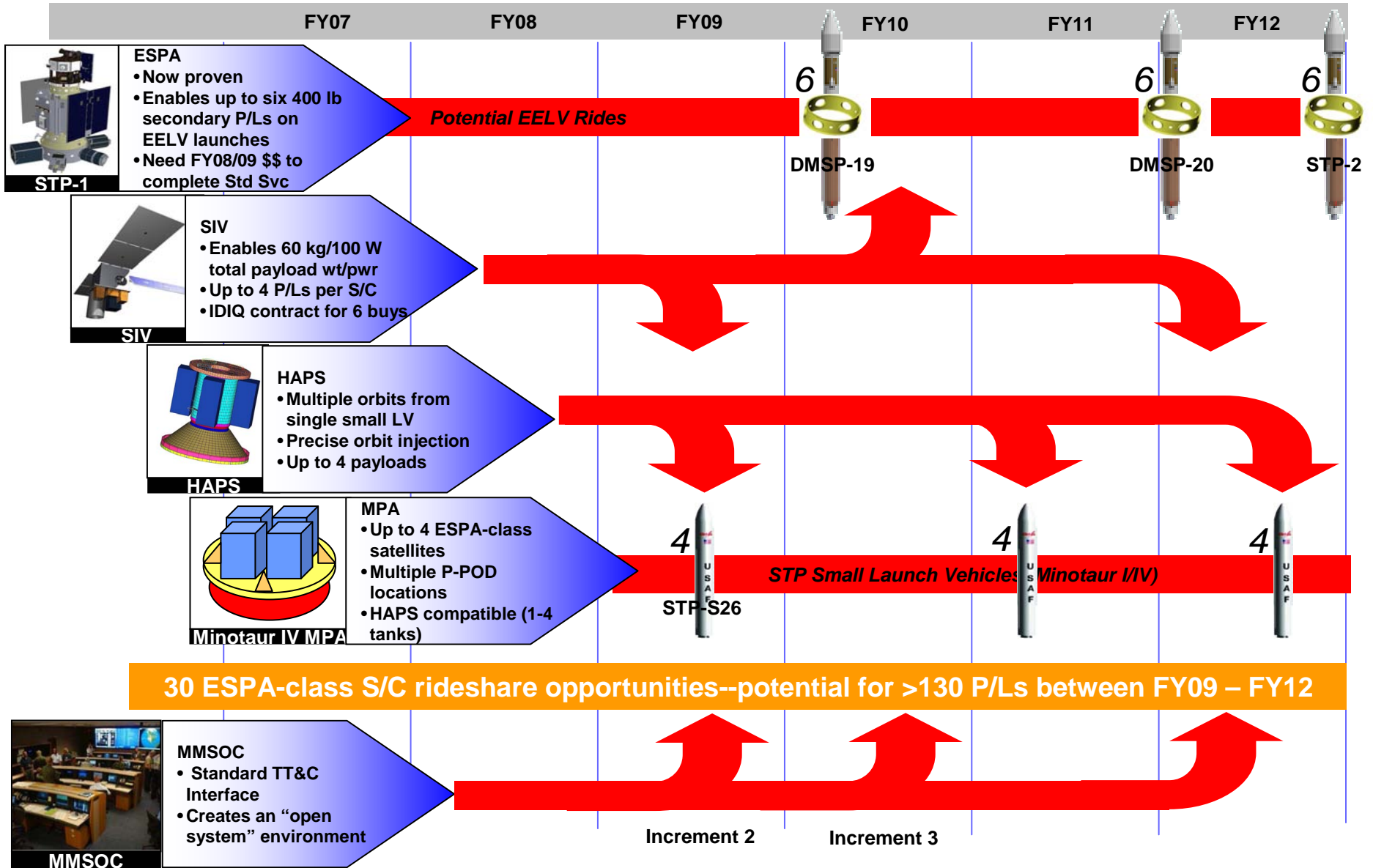
Standard Interface Vehicle (SIV)



- **Goal: “Productionized” small satellite bus**
- **SIV Program**
 - Uses lower risk existing technologies to build highly standard interfaces (spacecraft – payload – launch vehicle)
 - Cut costs with multiple spacecraft buys
 - Use heritage subsystems
 - Technical Aspects:
 - Spacecraft: ~ 400 pound class
 - Flexibility: ESPA, Minotaur, commercial vehicles
- **Lessons Learned**



Enabling Spacecraft Launch Opportunities





Summary

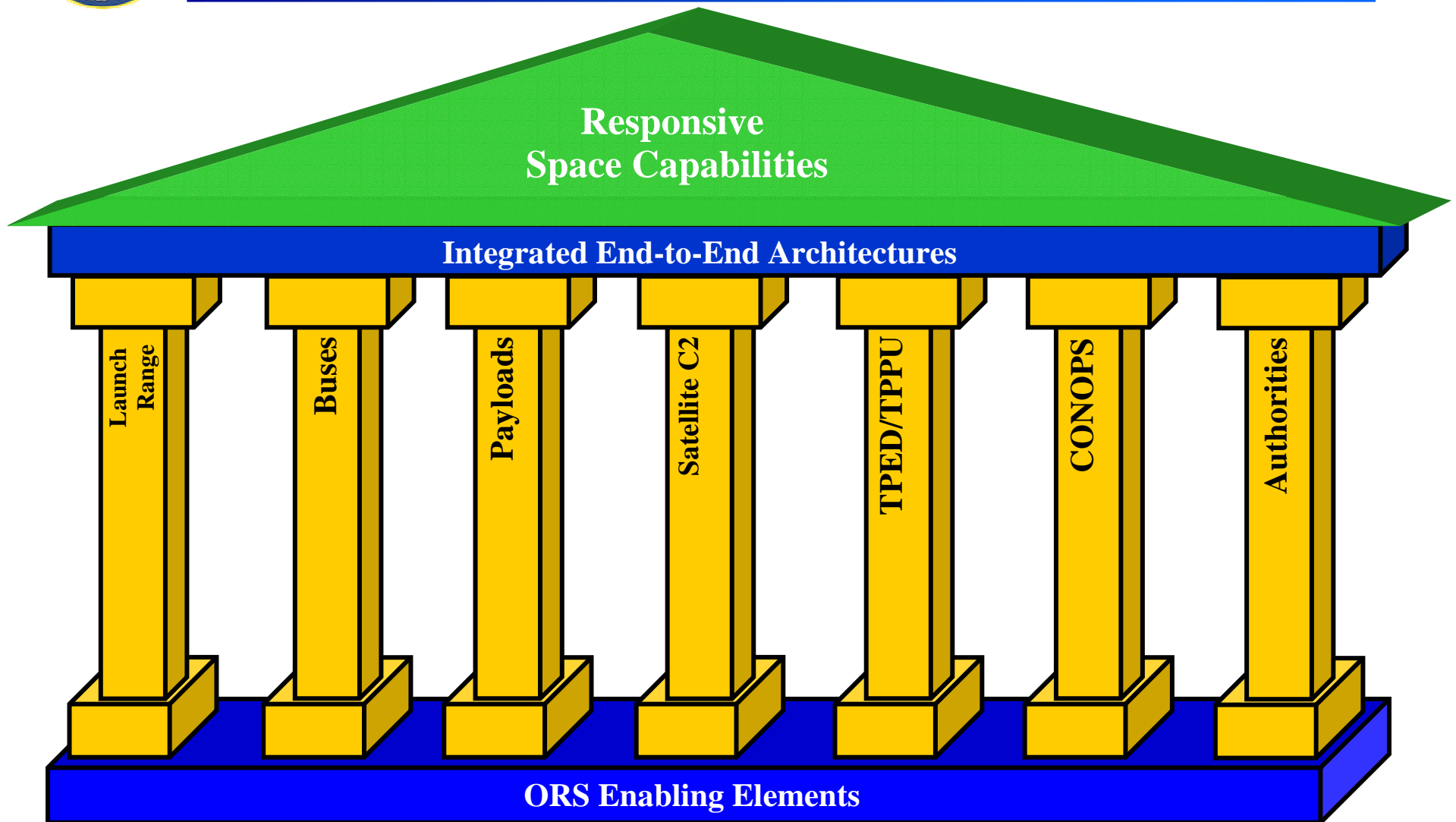
- **ORS office and concepts are real and gaining momentum**
- **The Space Development and Test Wing is developing many first generation enablers**
- **The larger community needs to mature to second generation capabilities**



Back Up Slides



ORS Enabling Elements



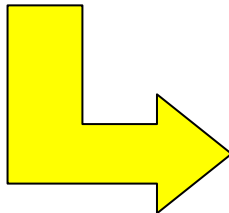
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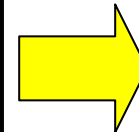
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Upcoming SDTW Contracts

- Space Test and Engineering Contract (STEC09)
 - RFP release ~ Jun 2008 (Small Business Acquisition)
- Follow on to Responsive Small Spacelift Contract
 - RFP release ~ Feb 2009
- Spaceports 3 Contract
 - RFP release ~ Summer 2009
- Multiple RSS IDIQ type Satellite Contracts
 - In study phase – projected RFP release ~ Fall 2009
 - Satellite Buses
 - Satellite Subsystems/Components

Rapid and flexible contracting processes are key ORS Enablers