



73rd MORSS CD Cover Page

UNCLASSIFIED DISCLOSURE FORM CD Presentation

712CD

For office use only 41205

21-23 June 2005, at US Military Academy, West Point, NY

Please complete this form 712CD as your cover page to your electronic briefing submission to the MORSS CD. Do not fax to the MORS office.

Author Request (To be completed by applicant) - The following author(s) request authority to disclose the following presentation in the MORSS Final Report, for inclusion on the MORSS CD and/or posting on the MORS web site.

Name of Principal Author and all other author(s):

Lee Lehmkuhl, James Przybysz

Principal Author's Organization and address:

MITRE Corp.
1155 Academy Park Loop
Colorado Springs, CO 80910

Phone: (719) 572-8307

Fax: (719) 572-8477

Email: leel@mitre.org

Original title on 712 A/B: **A Common Foundation of Information and Analytical Capability for AFSPC Decision Making**

Revised title: N/A

Presented in (input and Bold one): (WG **05**, CG___, Special Session ___, Poster, Demo, or Tutorial):

This presentation is believed to be:
UNCLASSIFIED AND APPROVED FOR PUBLIC RELEASE



A Common Foundation of Information and Analytical Capability for AFSPC Decision Making

Lt Col Jim Przybysz
HQ AFSPC/DDRC
Dr. Lee Lehmkuhl
HQ AFSPC/XPY (MITRE)₂

Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE 30 SEP 2005	2. REPORT TYPE N/A	3. DATES COVERED -	
4. TITLE AND SUBTITLE A Common Foundation of Information and Analytical Capability for AFSPC Decision Making		5a. CONTRACT NUMBER	
		5b. GRANT NUMBER	
		5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)		5d. PROJECT NUMBER	
		5e. TASK NUMBER	
		5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) MITRE Corp. 1155 Academy Park Loop Colorado Springs, CO 80910		8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)	
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited			
13. SUPPLEMENTARY NOTES See also ADM201946, Military Operations Research Society Symposium (73rd) Held in West Point, NY on 21-23 June 2005. , The original document contains color images.			
14. ABSTRACT			
15. SUBJECT TERMS			
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified	UU
			18. NUMBER OF PAGES 19
			19a. NAME OF RESPONSIBLE PERSON



Overview

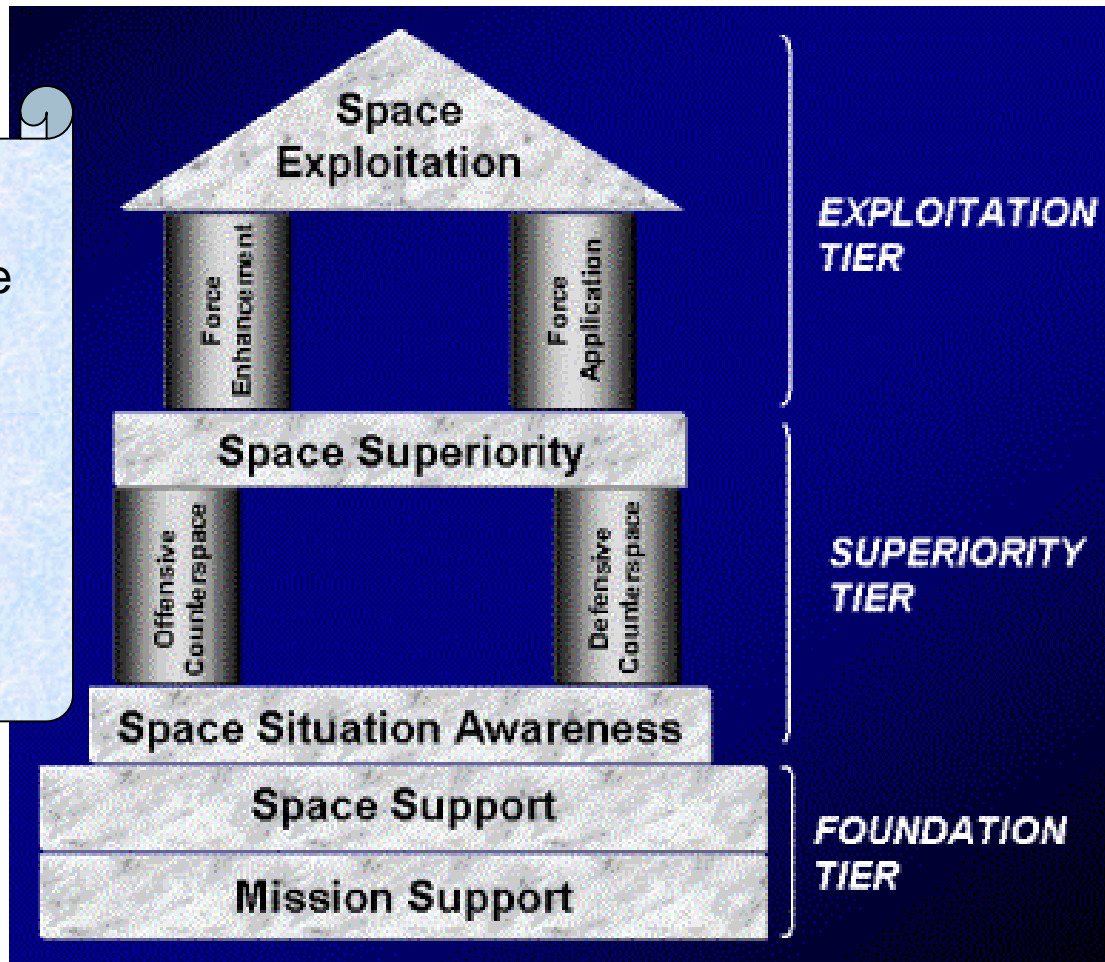
- **Space Superiority**
- **Need for Architecturally-based Analysis**
- **OV (Operational View) - 1**
- **Define Team/Process**
- **Incorporating ABR in IPP**
- **Analysis Methodology**
- **Way-Ahead/Summary**



Space Superiority

Space Superiority:

That degree of dominance in space that permits the conduct of operations by land, sea and aerospace forces at a given time and place without prohibitive interference by the opposing force. –AFDD2

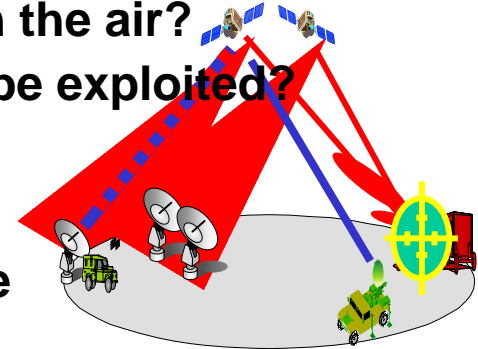


Space is no longer a sanctuary. We must architect our future to ensure we gain and maintain space superiority.



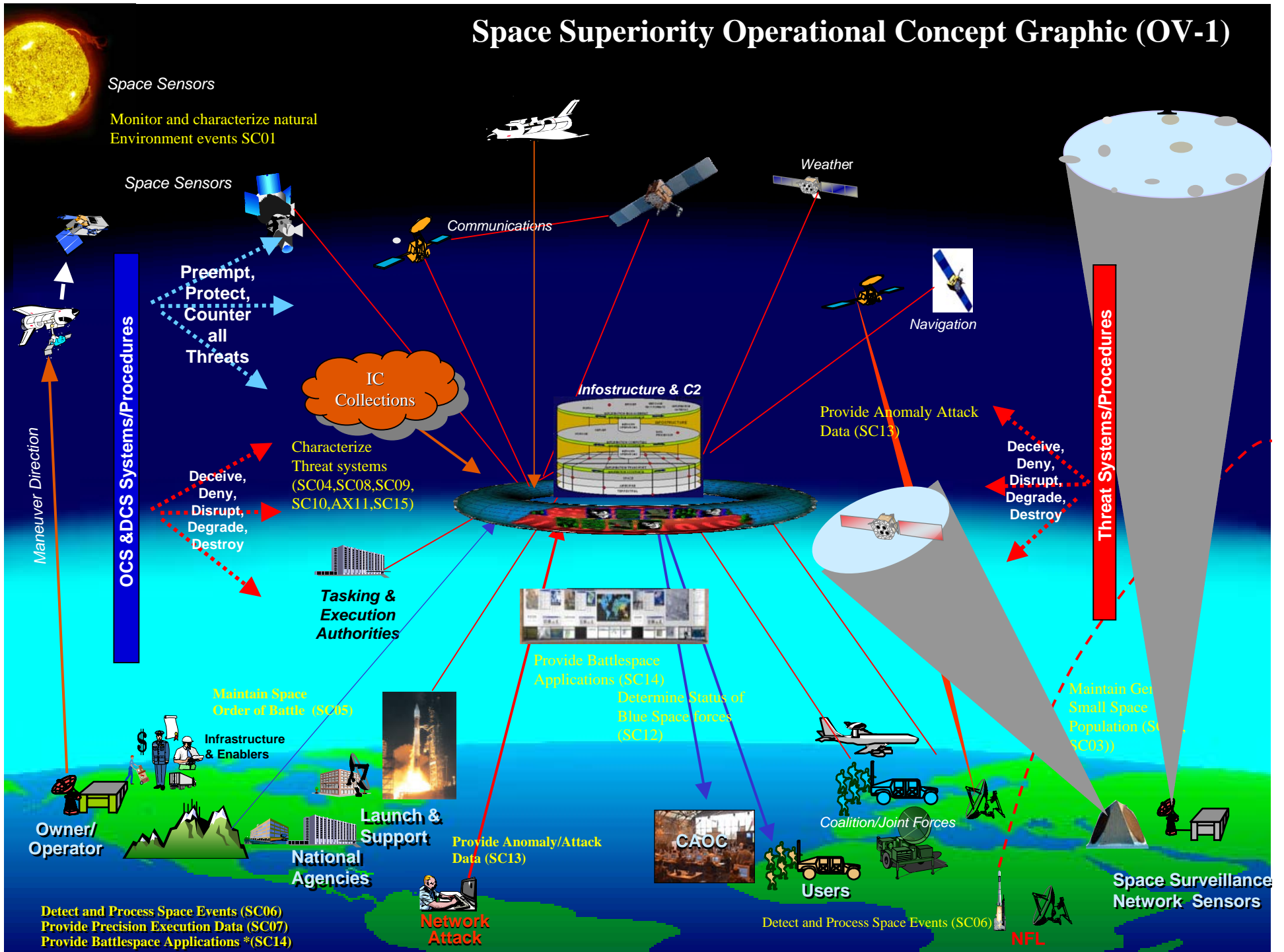
Need for Architecturally-based Analysis

- **Derive and validate functional CONOPS and requirements**
 - Why place sensors in space? On the ground? In the air?
 - What are the SSA/DCS/OCS synergies that can be exploited?
 - What is the optimal force structure?
- **Make investment decisions**
 - When is a new start/mod needed and what niche does it fill in the architecture?
 - What are the current shortfalls? When can they be filled? What are best options?
 - If funding changes +/-X% what systems should be added/cut and what is the corresponding change to mission effectiveness?
- **Evaluate joint warfighting effects**
 - Can we deny/destroy X capability of adversary Y?
 - What relative value does system X provide versus system Y?
 - How vulnerable are we to adversary's capability X?
 - How does architecture stack up to current OPLANS?



Architecture work provides the answers

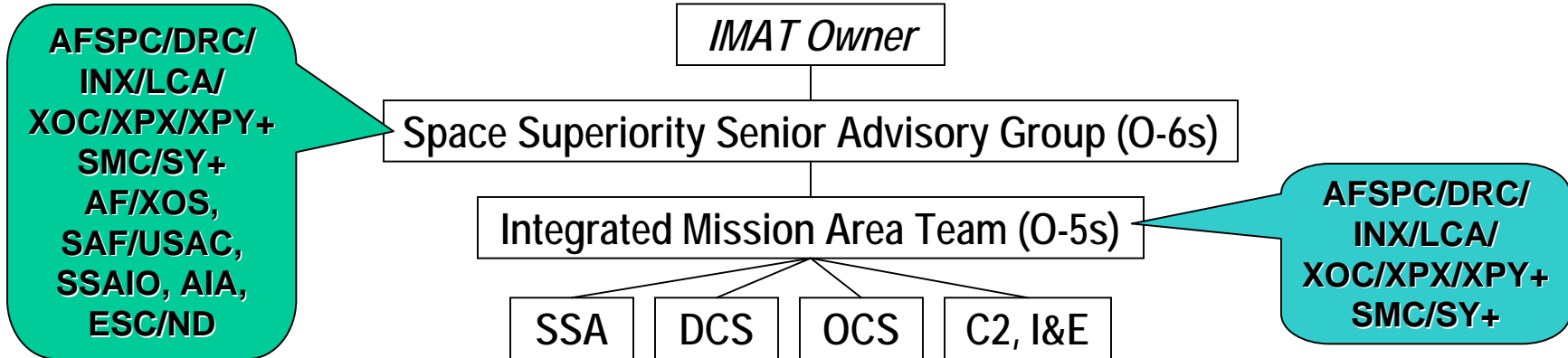
Space Superiority Operational Concept Graphic (OV-1)



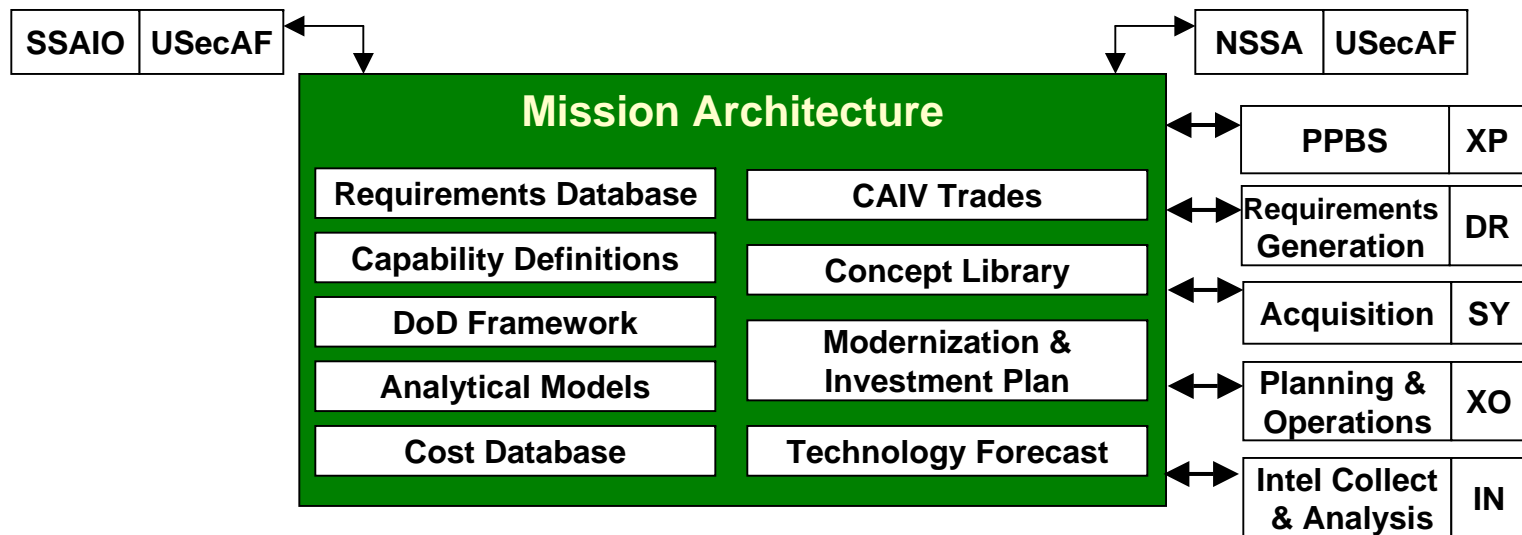


Architecture Baseline Review

Integrated Mission Area Team to Control Process

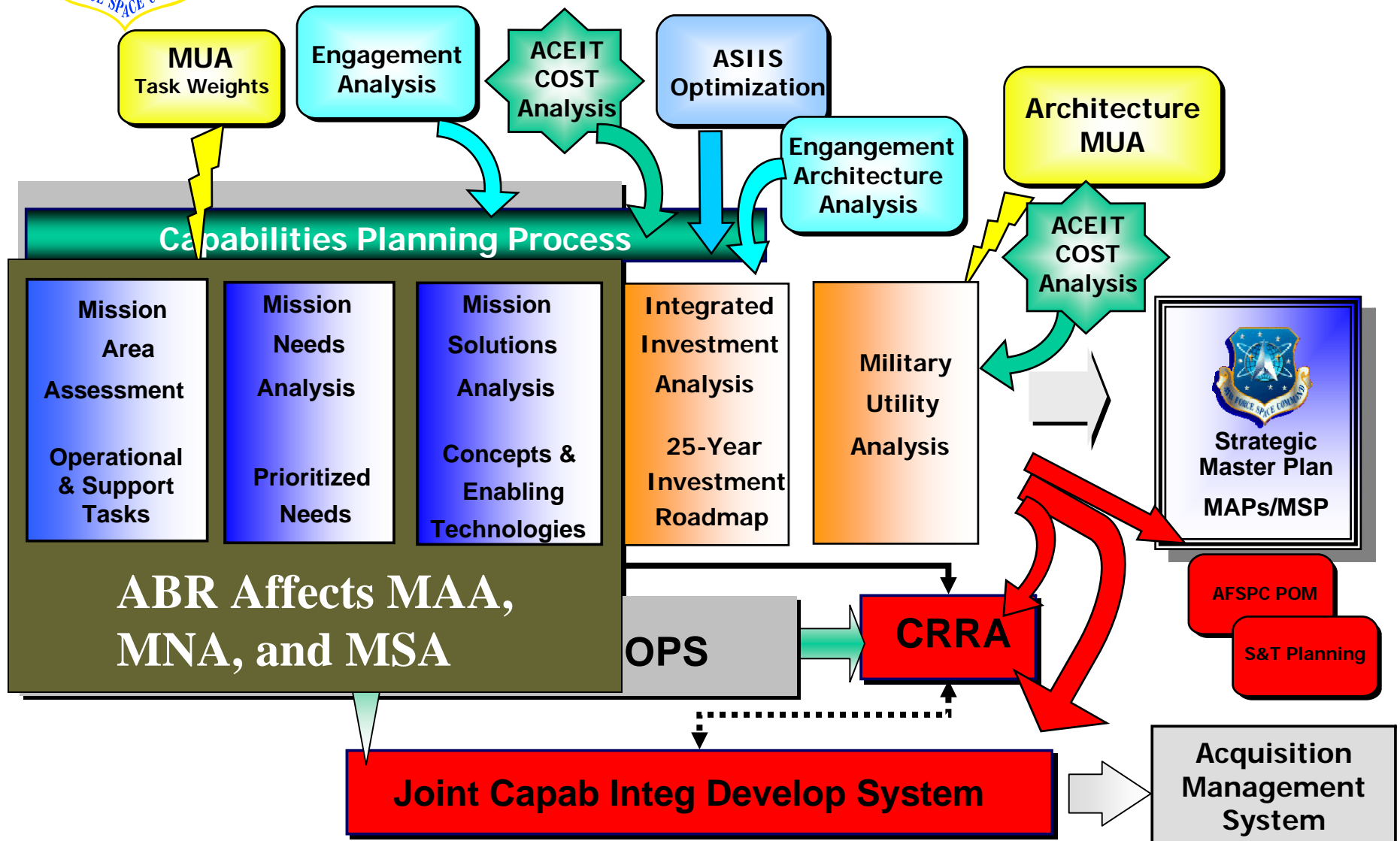


All Stakeholders Using a Single Data Repository





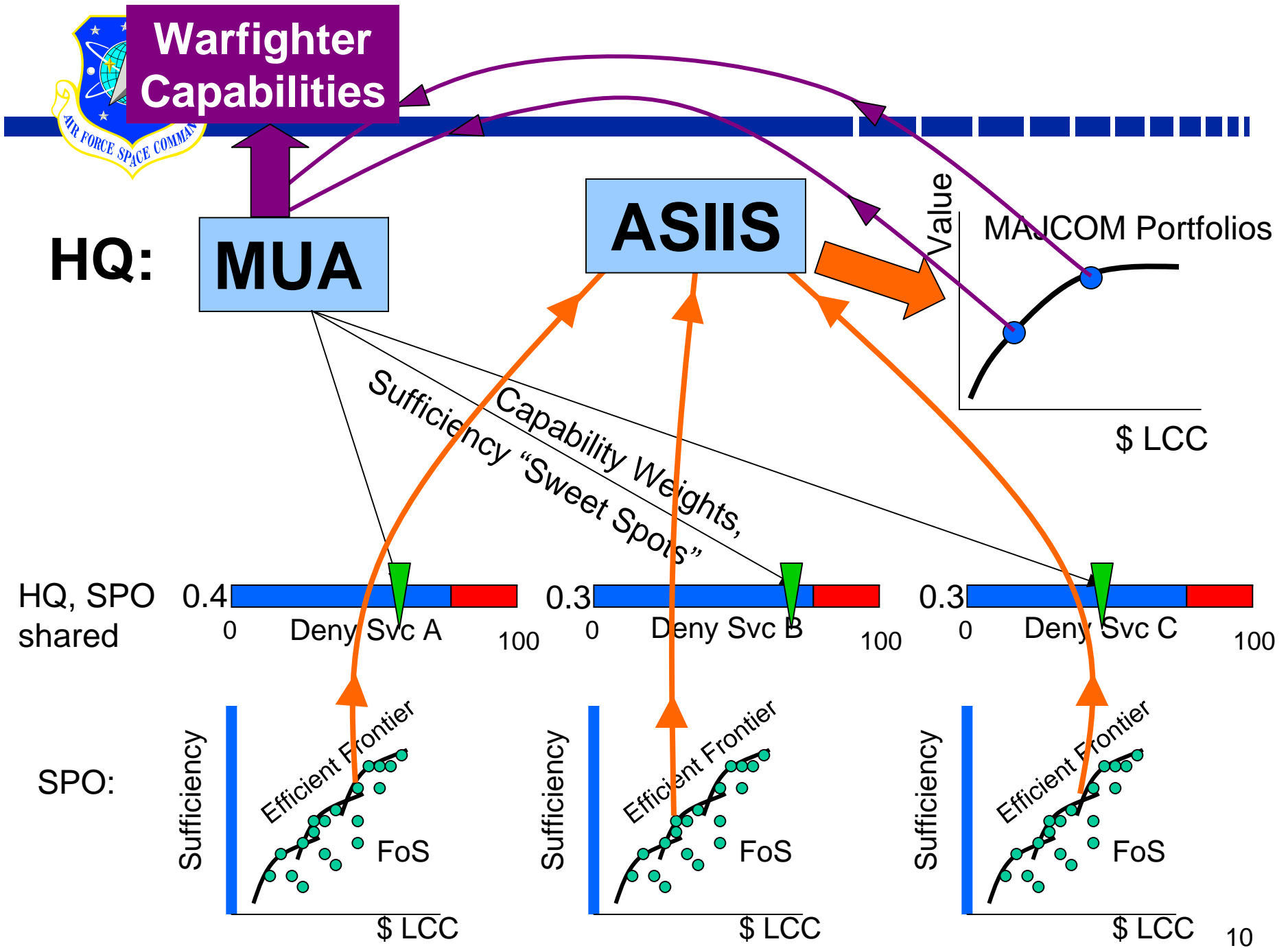
AFSPC Counterspace Planning





Incorporating ABR into AFSPC Planning

- **Collaborative Effort**
 - SPO
 - Planners
 - Analysts
- **Consensus on Organizational Strengths**
 - IPP foundation for Corporate Process
 - SPO engineering analysis ideal for FoS scoring
 - DODAF products for documentation
- **Analysis framework builds consensus**





ABR Affects MAA, MNA, MSA

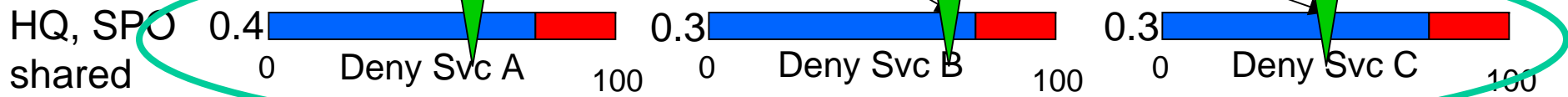
ASIIS

HQ:

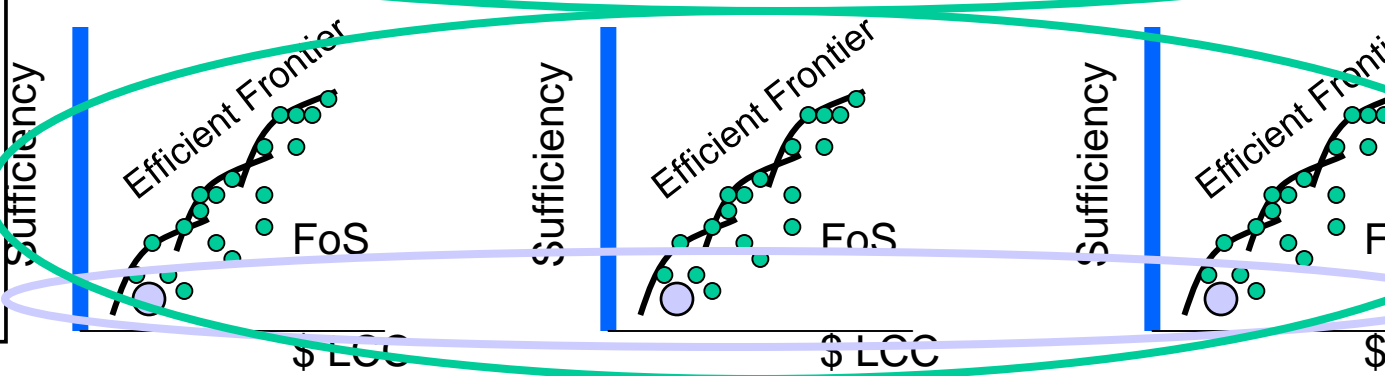
MUA

Mission Area Assessment
Operational & Support Tasks

Sufficiency "Sweet Spots"
Capability Weights,



Mission Needs Analysis
Prioritized Needs



Mission Solutions Analysis
Concepts & Enabling Technologies



Calculating FoS Capability

1) Determine 1-on-1 capability for each concept

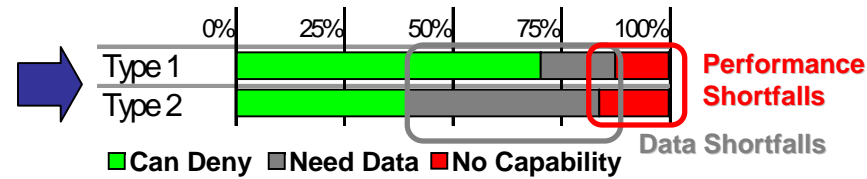
Potential capability to deny, 1-v-1		Concept 1	Concept 2	Concept 3	Concept 4	Concept 5	Concept X	Need Data	Total
Threat type 1	Target 1	50%	100%	0%	50%	0%	100%	0%	4
	Target 2	50%	100%	0%	50%	0%	100%	0%	4
	Target 3	50%	50%	0%	50%	0%	88%	0%	16
	Target 4	50%	50%	0%	33%	0%	100%	0%	8
	Target 5	50%	50%	0%	33%	0%	100%	0%	8
	Target 6	50%	33%	0%	33%	0%	92%	0%	8
	Target 7	50%	33%	0%	13%	0%	33%	50%	6
	Target 8	13%	50%	0%	13%	0%	33%	50%	6
	Target 9	13%	25%	0%	0%	0%	25%	50%	6
	Target 10	0%	0%	0%	0%	0%	0%	50%	6
Threat type 2	Target 1	0%	0%	50%	0%	0%	50%	50%	8
	Target 2	0%	0%	0%	0%	0%	0%	50%	6
	Target 3	0%	13%	38%	0%	13%	50%	50%	8
	Target 4	0%	0%	33%	0%	0%	33%	50%	6

2) Summarize FoS capability

• Determine FoS capability shortfalls

→ FoS TPM

FoS Capability:

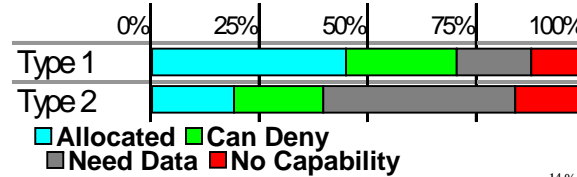


4) Summarize FoS capacity

• Determine FoS sensitivity to capacity

→ FoS TPM

FoS Capacity:



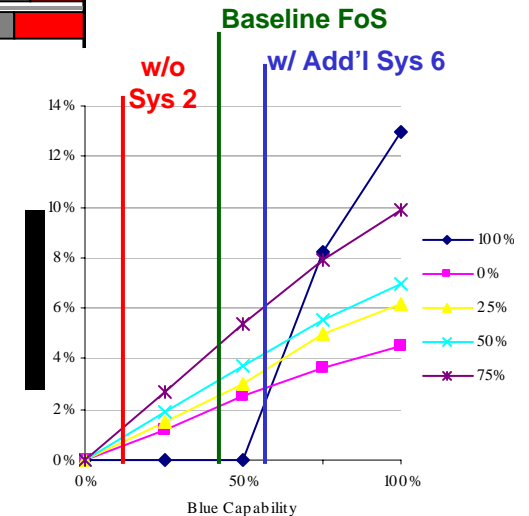
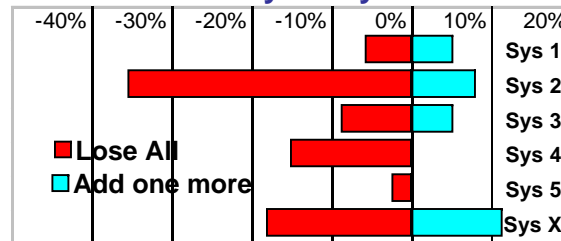
Example FoS Utility Analysis

3) Allocate systems to threats in the scenario

• Determine FoS capacity against threat

Allocate Capacity to deny target capability		Concept 1	Concept 2	Concept 3	Concept 4	Concept 5	Concept X	Capacity	Total
Threat type 1	Target 1	1						4	4
	Target 2	1						4	4
	Target 3	1		1				12	16
	Target 4			1				3	8
	Target 5					1		2	8
	Target 6			1				3	8
	Target 7			1				1	6
	Target 8	1		1				3	6
	Target 9							0	6
	Target 10							0	6
Threat type 2	Target 1		1					4	8
	Target 2							0	6
	Target 3				1			1	8
	Target 4							0	6
Number Allocated		1	3	1	4	1	1	37	
Number Available		1	3	1	4	1	1		

Force Sensitivity Analysis





Architecture Analysis Methodology

HV-1

Database	CAIV Traces
Definitions	Concept Library
Anal. Framework	Modernization & Technology
Anal. Models	
Cost Database	

Requirements

The Well of Data

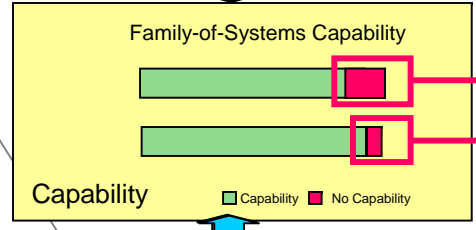
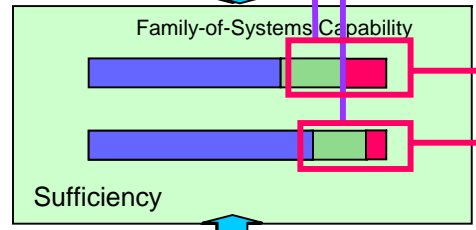
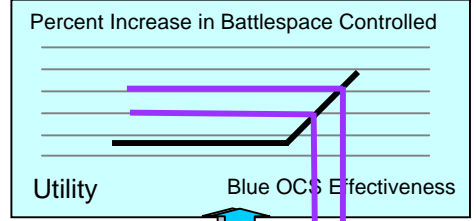
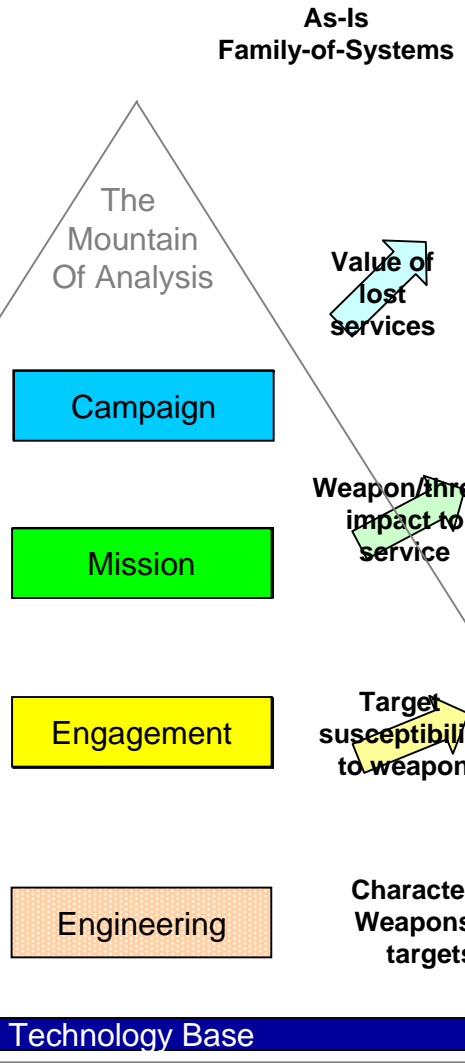
Scenarios

Global Database

Target	Weapon	Effect	...
Target 1	Weapon 1	Effect 1	...
Target 2	Weapon 2	Effect 2	...

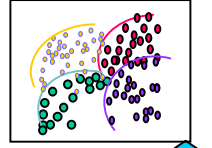
Baseball Cards (SV-7)

Core team in place and working all



HV-2

To-Be FoS Optimization



Costs

Item	Cost	...
Item 1	1000	...
Item 2	2000	...

Concepts

Automation Shortfall

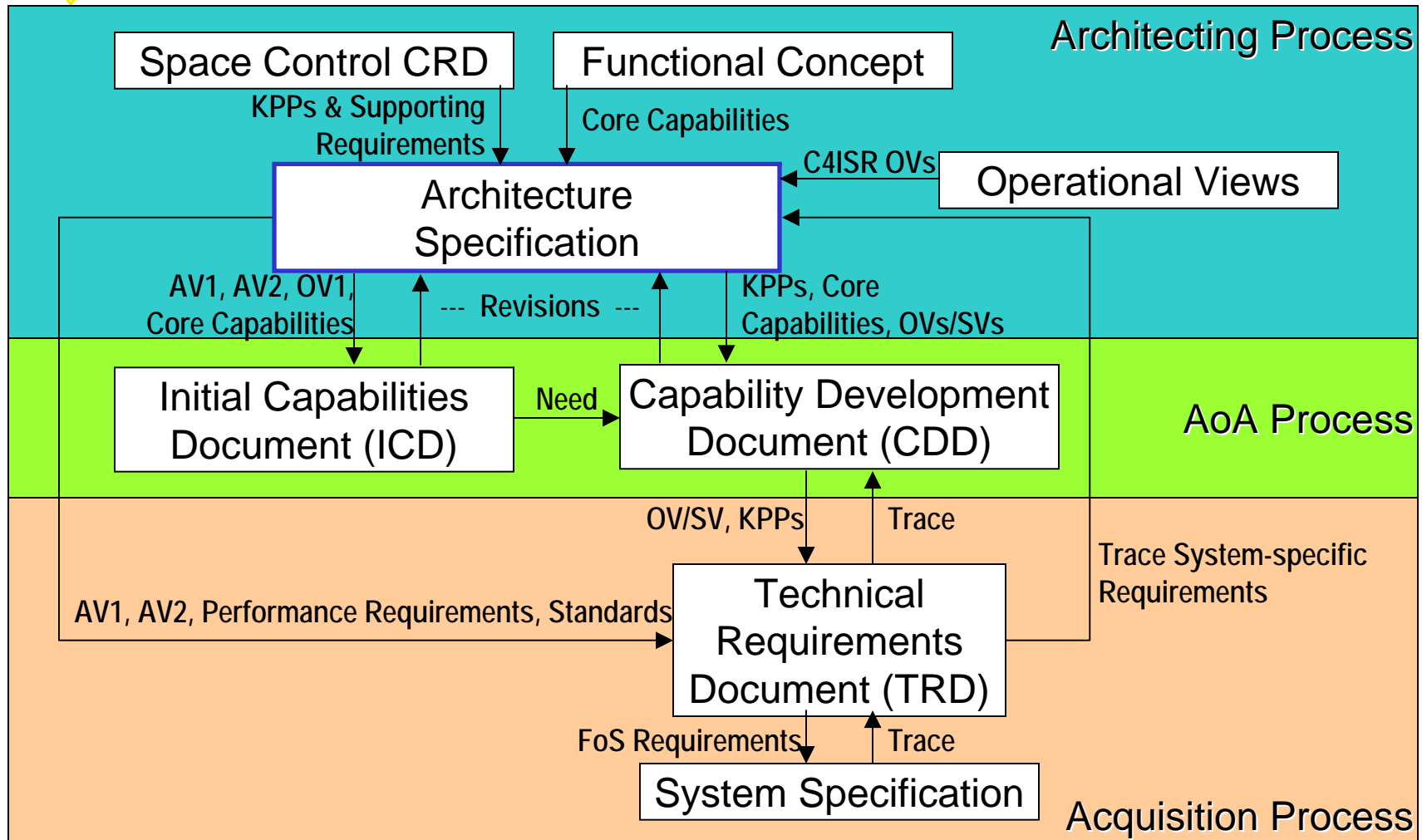
Concept 1	SSA
Concept 2	
Concept 3	

Shortfalls

Enabling Technology



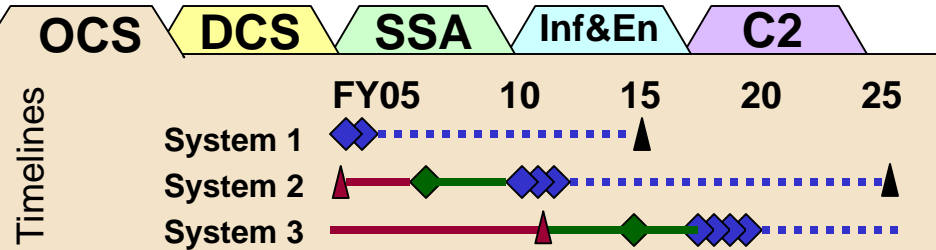
Architecture Specification Ties it Together



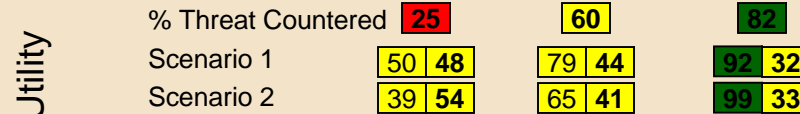


Scorecard

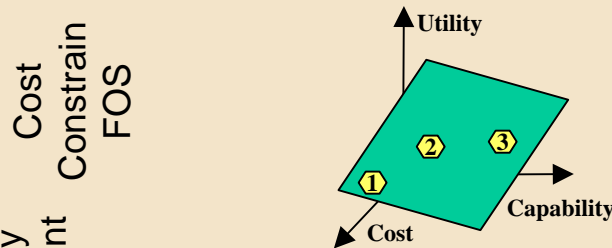
What Systems When



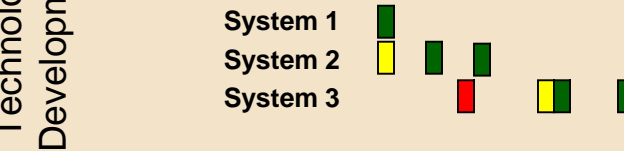
How it Affects Mission



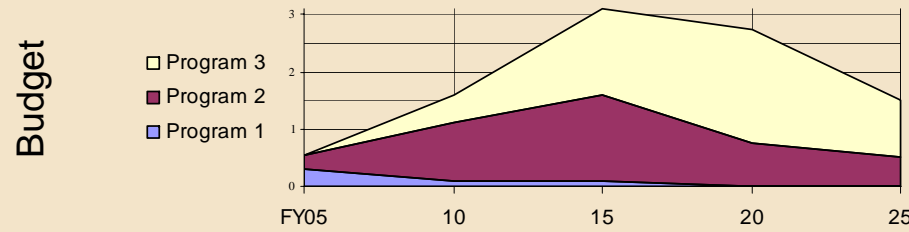
Why These Systems



Key Technology Maturation Gates



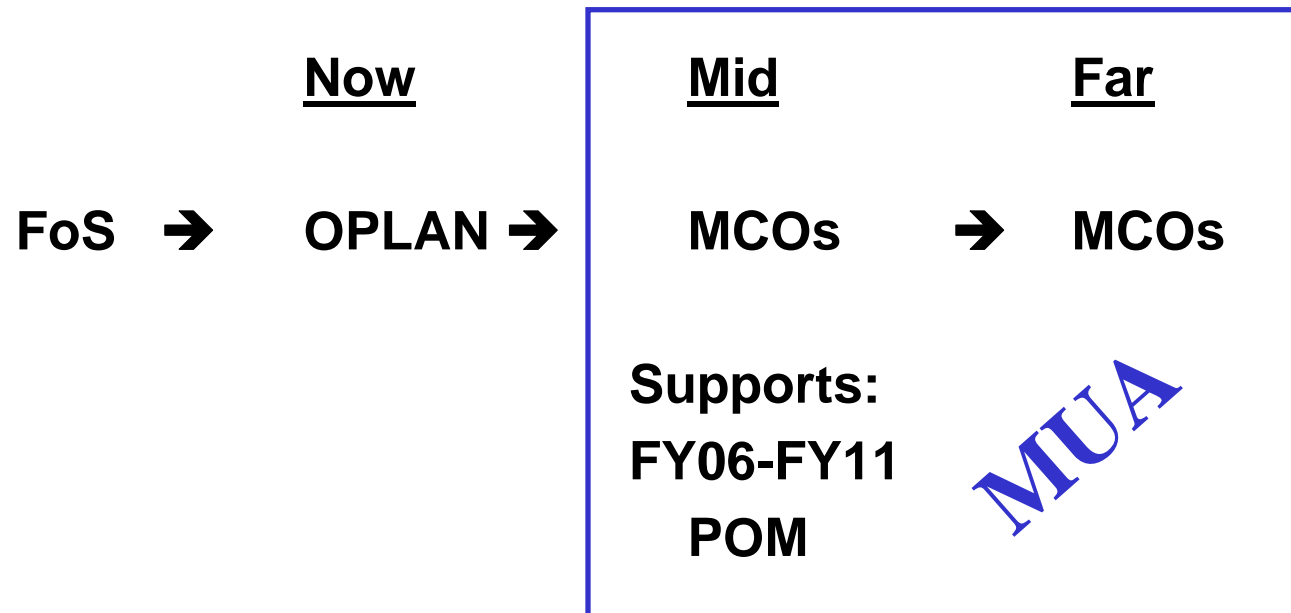
Funding Profile





Way Ahead

- **Mid 2005**



- **Beyond**

- Campaign model transition
- Expansion to all AFSPC Mission Areas



Summary

- **Core team in place and working all mission areas**
- **Merging process into AFSPC Integrated Planning Process**
- **Pathfinder for overall MAJCOM Corporate Process**
- **OCS**
 - Refining evaluation process to make as relevant as practical to Ops Planning
 - Defining concepts sufficiently to enable effectiveness and cost analysis to identify optimal cost-constrained FoS
 - Other service/agency options can be included
- **Analyze DCS similarly, only blue “targets” and red weapons – intel-dependent**
- **SSA is tougher**
 - Using AFSPC/XPY SSA value model and SSNAM simulation
 - Linking SSA performance to weapon system performance



Back up charts



Arch Spec. – Database of FoS Info

C4ISR Items

AV 1 →

OVs →

SVs 1-6, 11 →

TV-1,2 →

SV-7 →

AV-2 →

Architecture Specification

Database Contents

1.0 Overview and Summary

2.0 Applicable Documents

3.0 Capability Definitions and Operational Views

4.0 Performance Characteristics and System Views

5.0 Standards

6.0 System Specific Requirements

7.0 Verification and Preparation for Delivery

8.0 Architecture Evolution

9.0 Integrated Dictionary

Other Items

← Scenario Documentation

← Policies and References

← Functional Concept & Maps

← Target list & MOE/MOPs

← Environmental,
Transportability,
Design/Construction, IA,
Logistics,
Personnel/Training

← Responsibilities and
Procedures

← HV-1 and HV-2