

Mission: To Provide a Modeling and Simulation Environment to Support Army Transformation and Army SMART Decisions in a Joint C4ISR Framework.



Joint Virtual Battlespace

Current Objective: To Build the M&S Environment to Support Acquisition Decision for the FCS Program.

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Excerpt from Mr. Olson's Status Report on SBA to the Gov. Electronics & Info. Tech. Association, Sep 01

- **On SBA Infrastructure**

- "No one [program] wants to buy the infrastructure" (RDEC federation quote)
- Developing the key cross-cutting enablers is being neglected within DoD
- Almost all the money is within individual acquisition programs, who have no motivation to be altruistic regarding larger DoD needs
- Framework provides a viable tool to support next steps
- A systems engineering approach is needed to complete the framework and move to capability

Historical Background/ Accomplishments

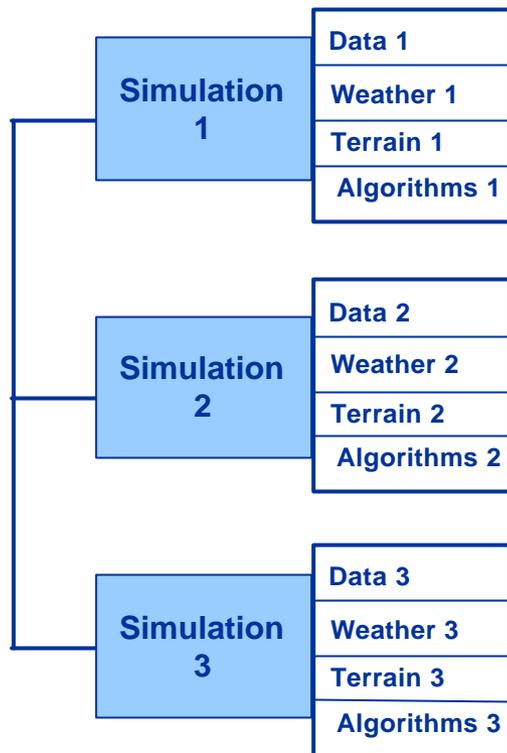


- **January 2001, ASA(ALT) Directed PEO IEW&S(JPSD) to Build the JVB.**
- **October 2001, ASA(ALT) Recognized JVB's Potential to Support FCS' Acquisition Process. Also, ASA(ALT) Reaffirmed the Army Need to Have the JVB Capability to Support S&T Activities for OF.**
- **November 2001, the First Instance of the JVB Environment Was Demonstrated to OFTF.**
- **December 2001, FCS and TRAC Initiated Plans to Conduct a Phase II C4ISR Study to Support FCS Milestone B. The JVB Was Identified As a Required Capability.**
- **Early February 2002, JVB Demonstrated to DUSA(OR).**
- **February 2002, JVB Adjusted It's Development Path and Schedule to Ensure an Instance of the JVB Capability Will Be in Place to Answer the Issues Proposed in the AoA Area 7.**
- **June 2001- April 2002, Dr. Andrews, DASA-RT, Recognizes JVB on three occasions while presenting testimony to congressional committees.**
- **An Instance of JVB Will Be Ready for Scenario Loading in Sep 02 to support the FCS AoA Area 7.**



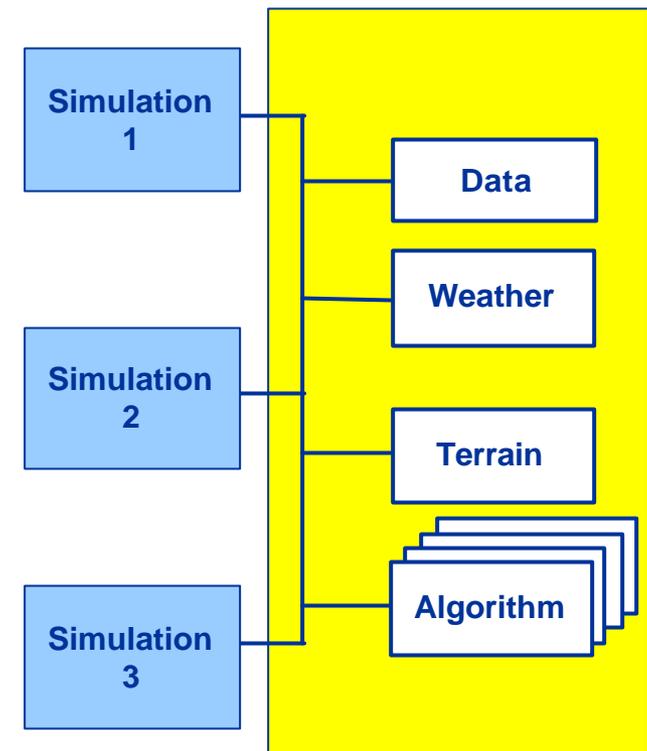
- **Dr. Andrews, DASA-RT, Recognizes JVB on three occasions while presenting testimony to congressional committees.**
 - **5 Jun 01 to Senate Armed Services Committee - Subcommittee on Emerging Threats and Capabilities**
 - **26 June 01 to House Armed Services Committee - Subcommittee on Military Research and Development**
 - **10 Apr 02 to Senate Armed Services Committee - Subcommittee on Emerging Threats and Capabilities**
- **Advanced Simulation: ... the Joint Virtual Battlespace, (JVB) program, is an enabling technology for evaluating how FCS contributes to the total capability of the Objective Force, and how the Objective Force plays in a joint force. JVB, combined with virtual prototyping, also could provide an effective means for performing Operational Test and Evaluation without the need for numerous hardware test articles. This could result in significant time and financial savings in the Army Acquisition Process.**

Current Approach



Precoordinate to ensure everything is as Consistent as possible
Post coordinate to interpret inconsistencies between models

JVB Framework



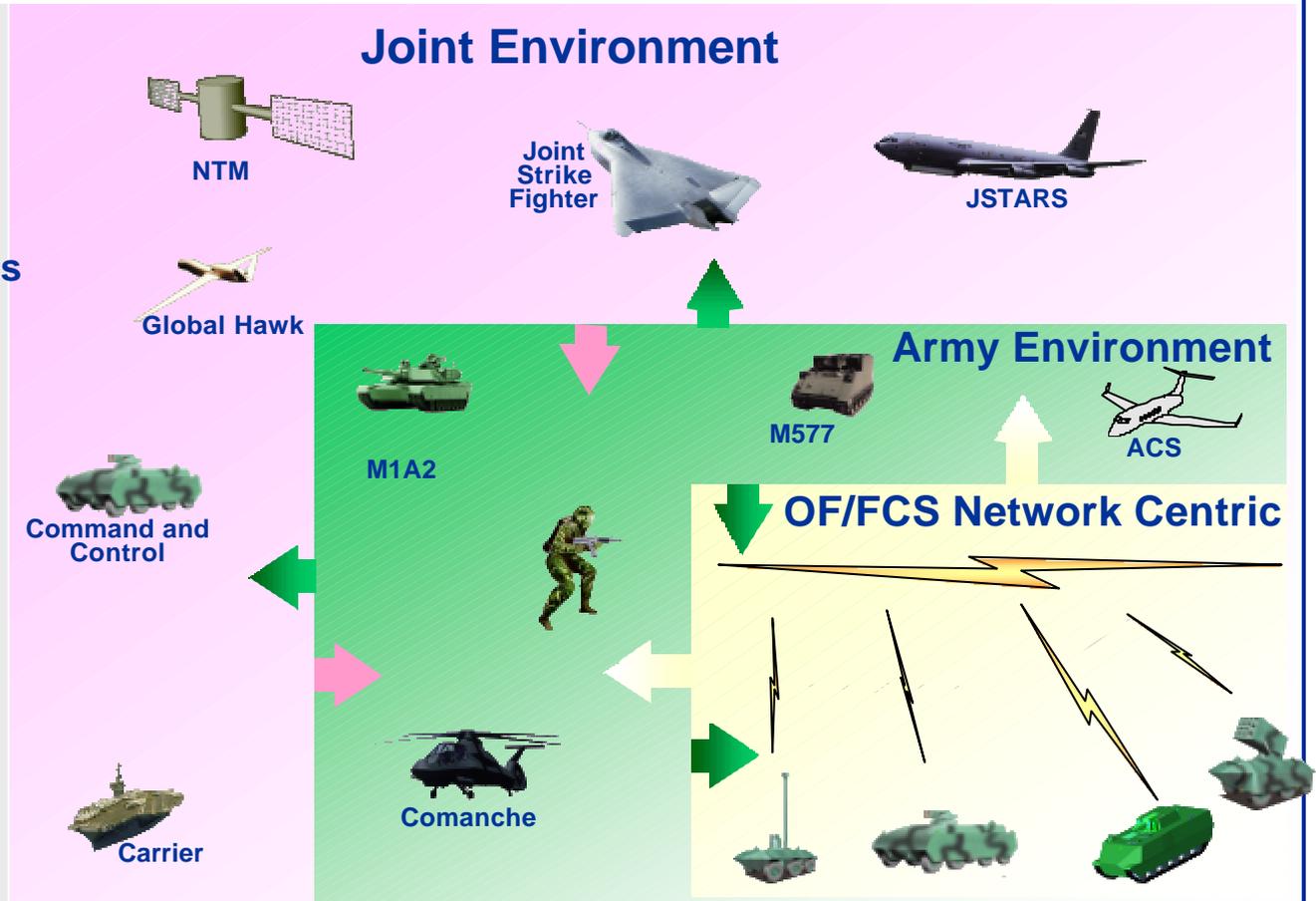
All simulations use Consistent data and algorithms

SMART
(**S**imulation & **M**odeling for **A**cquisition, **R**equirements and **T**raining)...

...Tool To Support The Objective Force and Future Combat System

JVB Design Includes:

- Joint Forces
- Legacy Forces
- Objective Force
- Future Combat Systems
 - C3
 - ISR
 - Robots
 - New Weapons
- Logistics
- Dynamic Weather
- Dynamic Terrain
- High Fidelity Terrain
- Certified Data



Unit of Action C4ISR Analysis Strategy (TRAC)



C4ISR Model & Analysis Working Group

- Army Red Team M&S
- Oversee & Integrate
- LSI, Industry, FFRDC

Battle Lab Experiments

- Unit of Action (MMBL)
- Sustainment (CSSBL)
- Shaping Battle (DSABL)
- Cdr's Info Cell (BCBL-L)
- UA ISR Rqm'ts (BCBL-H)

O&O
M&S

AoA
M&S

Fall
'02

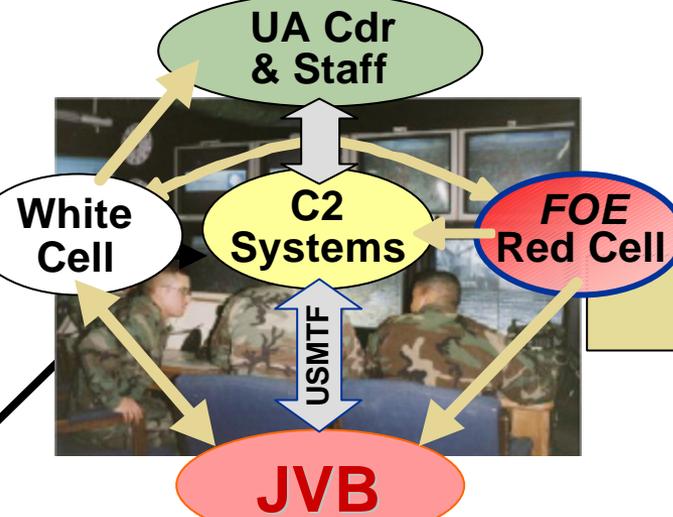
LSI 4 Demo Thrusts

- Scalable Mobile Networking
- Synch'd Collaborative C2
- Distributed Info Mgmt
- Tactical Info Assurance

UA C4ISR Experiment Objectives

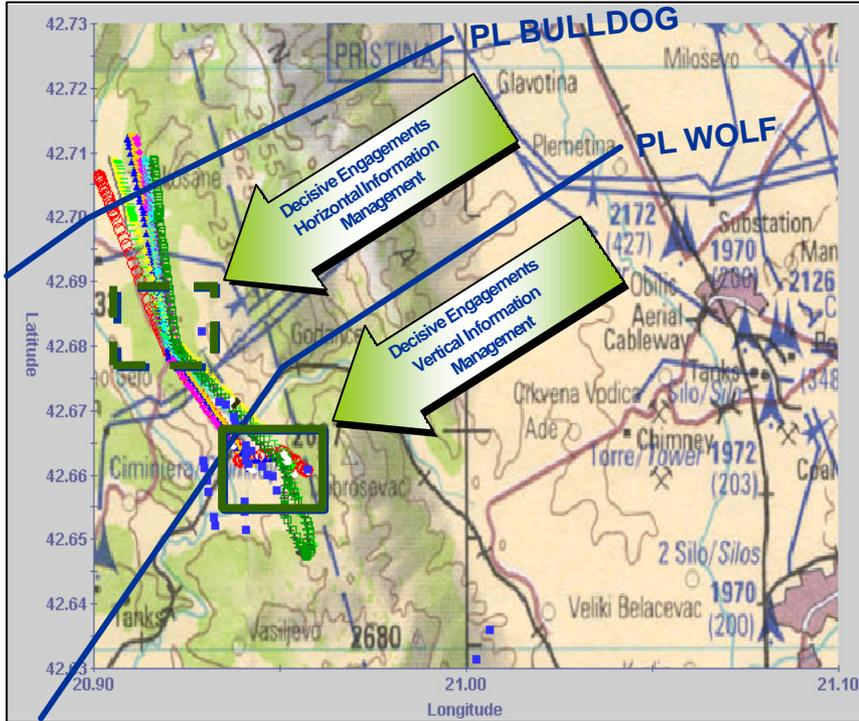
- Serve as a major integrating event for FCS/UA C4ISR O&O and OA.
- Assess Cdr's ability to command UA.
- Assess C4ISR capabilities to enable the UA O&O.
- Collect DTLOMS insights.

LSI Capstone Experiment



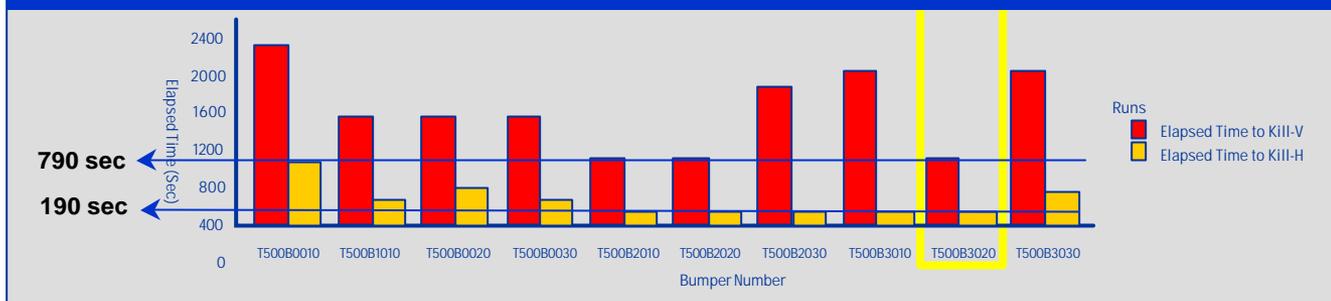
- Surrogate UA C2 systems.
- Sensor & network models.
- Feeds from higher.
- High resolution environment.
- Caspian scenario vignettes.

Briefed to CSA at AET RRC, 19 Apr 02



Combination of Information, Systems, and CONOPS/TTPs Provides Warfighters the Tools and Applications to Accomplish the Mission

First Detection to Engagement, Vertical versus Horizontal



Overarching Study Issue: How Does the Objective Force Commander Exercise Battle Command, Enabled by the C4ISR Architecture?

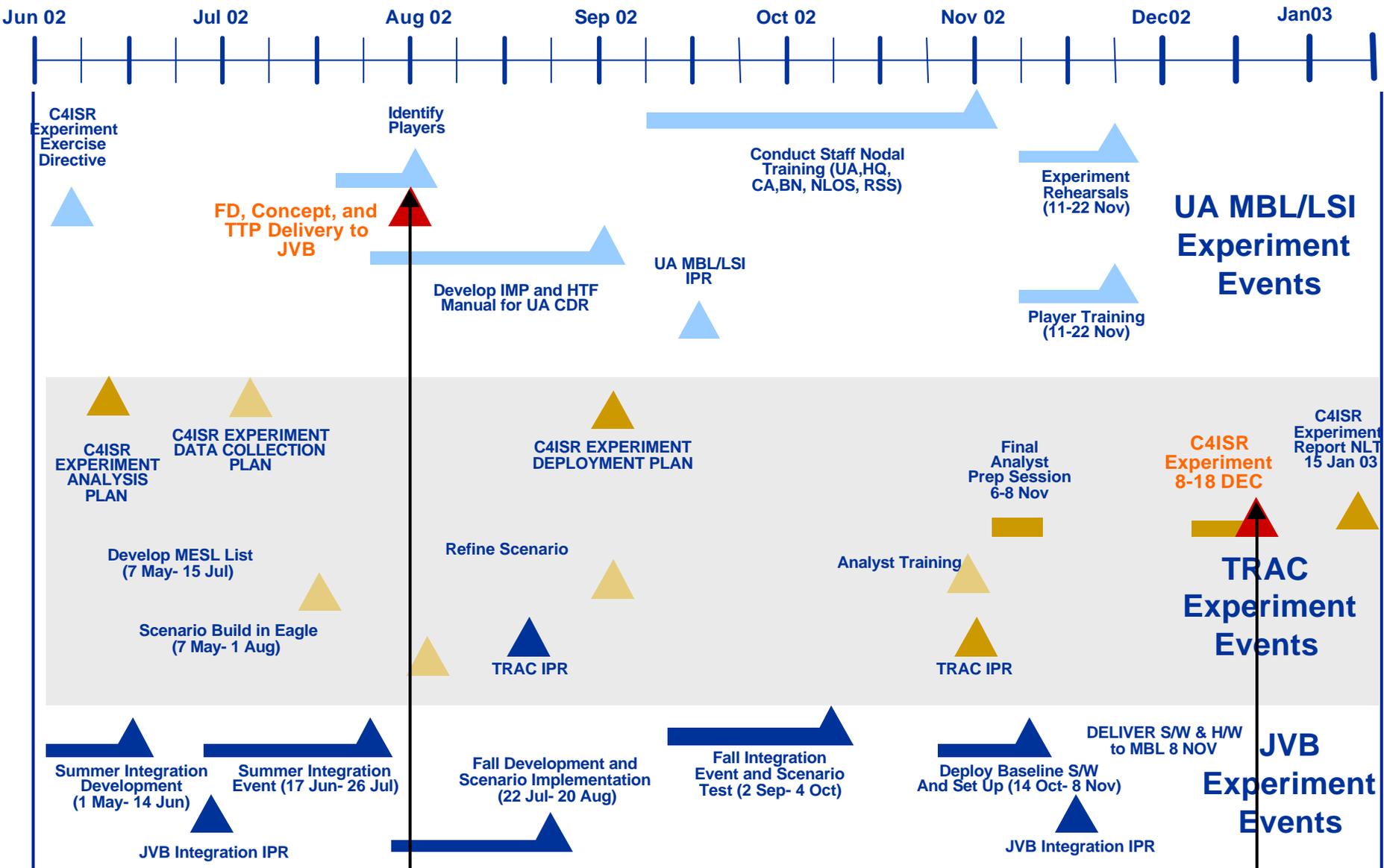
JVB Gives Decision Makers the Capability to Measure the Combat Effectiveness of Information and how It's Used

In the TRADOC-approved Scenario, JVB Will -

- **Implement FCS C4ISR Procedures and TTPs**
- **Collect Data Supporting Analysis of the C4ISR Procedures and TTPs**
C4ISR Capabilities and Limits
Force Effectiveness
- **Provide the Link for Large and Small Scale Units to Work Together in a Common Battlespace**



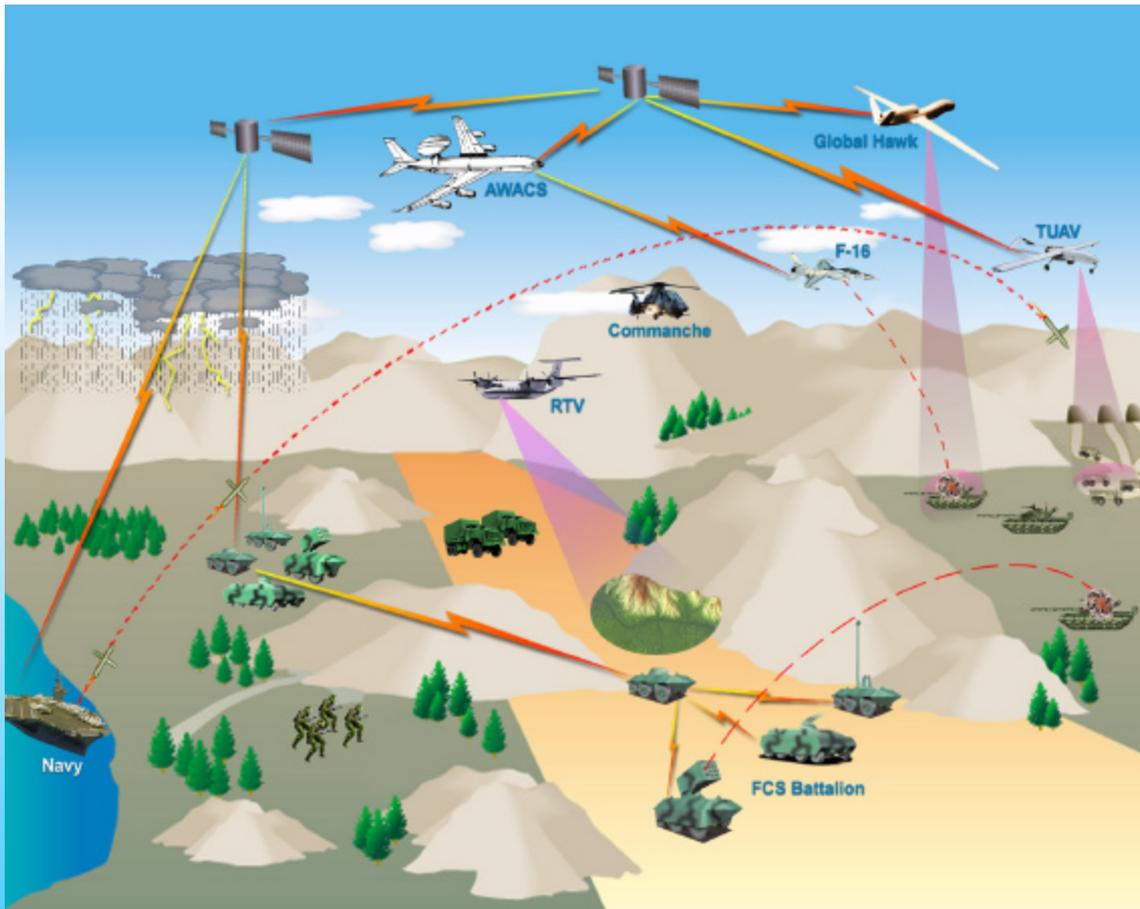
Current (Jun 02) JVB Schedule to Support FCS Fall 02 Study





- **JVB will**

- Support Army Transformation Acquisition Decisions
- Provide Authoritative Joint C4ISR Environment for Acquisition, Analysis and Experimentation
- Provide Flexible Environment to Integrate Test and Evaluation Models
- Support Requirements, Tech. Tradeoffs (What-If Analyses to provide insight for S&T investments) and Interoperability Studies
- Support O&O and TTP Development



• **Architecture Provides**

- Common Synthetic Battlespace
- Component Based Environment
- Information Driven
- Plug & Play Simulation

• **Reduces Development Time**

- Integrate Mature Technologies
- Early Experimentation
- Requirements Development
- CONOPS/TTPs Refinement
- Trade-Off Studies

• **Enhances Quality**

- Re-use Partners' Authoritative Models
- Early Concept Evaluation in Realistic Environment
- Flexibility For System Modifications

• **Reduces Costs**

- Engineering Design Through Simulation
- Streamline Development Process

• **Accelerates Fielding of Obj. Force Systems**

• **Achieves Joint Interoperability (System of Systems)**

• **Underscores Warfighter's Logistic Challenge (Tooth to Tail Ratio)**



- **On Mr. Olson's Status Report -- SBA Infrastructure**

- "No one [program] wants to buy the infrastructure" -- **ASA(ALT) Making an Investment in Critical Technologies to Enable a Coherent Environment for SBA**
- Developing the key cross-cutting enablers is being neglected within DoD – **Starting to Address Those With the JVB Architecture Based on Consensus Standards Components and a Consistent Environment**
- Almost all the money is within individual acquisition programs, who have no motivation to be altruistic regarding larger DoD needs – **ASA(ALT) Recognized This in the Vision for JVB and Has Taken Steps to Fund It for Broad Use**
- Framework provides a viable tool to support next steps – **On the Path to Establish the Framework**
- A systems engineering approach is needed to complete the framework and move to capability – **Fully Agree and Will Participate With Other Members of the Community**

Joint Virtual Battlespace Team and Partners



MANSCEN

- NBC Environment
- Obscurants



JPSPD

- PM FCS Support
- Leverage ACTD's
- Joint C4ISR
- Integrated Analysis Tools
- Integration & Evaluation Center



JFCOM

- Joint C2 & Simulation Support



DMSO

- HLA Standards
- Enviro. Fed

STRICOM

- High Fidelity Live-Virtual-Constructive
- Semi Automated Forces



COE ERDC

- Terrain/Weather
- Mobility
- Seismic



AMSO

- M&S Policy
- SMART

Standard, Flexible, Extensible Architecture Allows Integration of Models from Subject Matter Experts to support Army Transformation



Sandia National Lab

- Robotics
- Sustainment/Reliability
- Human Factors
- Acoustics



Army Research Laboratory

- Human Workload
- Acoustics



TRADOC TRAC-Leavenworth

- Force-on-Force

DOE Labs

- Lethality/Survivability



AMC

- RDEC Federation

CECOM



- Night Vision Simulations
- Comms Model

Los Alamos National Lab

- Force Structure



ASA(ALT)

- Army S&T Investment
- Guidance

TRADOC

- MMBL
- TRAC Ft Lee
- FPBL

