



# LOW-COST ATTRITABLE AIRCRAFT TECHNOLOGY (LCAAT)

## SYSTEM LEVEL CAPABILITIES

- Operations research
- System life cycle analysis
- Analysis of alternatives
- Theater simulation



## VEHICLE LEVEL CAPABILITIES

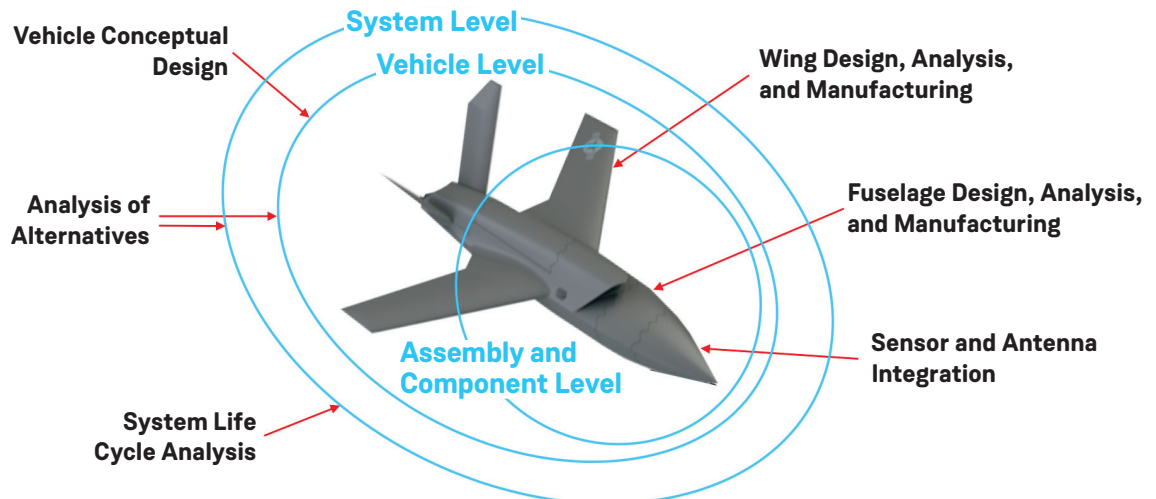
- Clean-sheet design and analysis
- Multiphysics conceptual design
- Performance prediction analysis
- Technology trade-offs

## COMPONENT LEVEL CAPABILITIES

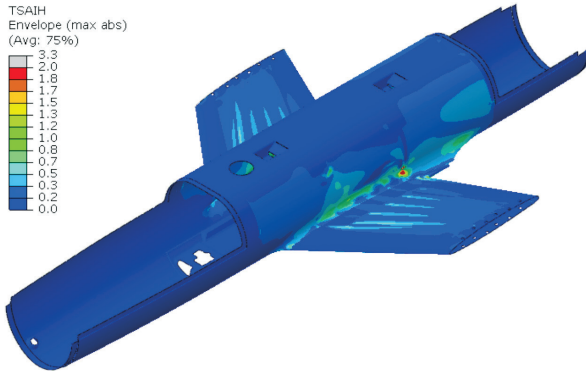
- Airframe design and analysis
- Sensor and antenna integration
- Rapid, low-cost manufacturing development
- Full-scale structural verification and validation testing

## RESEARCH PROJECTS

- Low-Cost Design and Integration (LADI)
- LCAAT clean-sheet design including structurally integrated antennas
- Alternate takeoff and landing AoA
- Automated aerial refueling studies
- Innovative Manufacturing for Design (IMD)
- LCAAT Wing Structural Design and Manufacturing Demonstration (WiSDM)
- LCAAT braided fuselage demonstration
- Low-Cost Attributable Strike UAS Demonstration (LCASD)



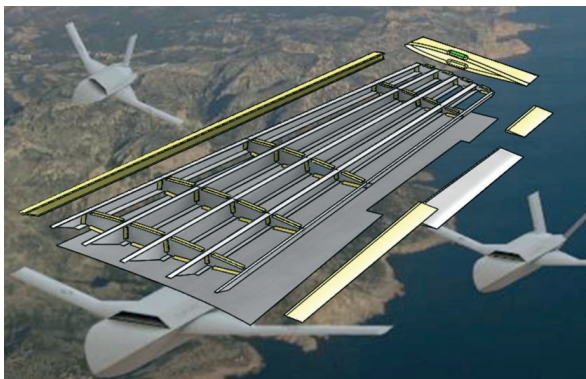
UDRI engages at all levels of LCAAT development



Failure/damage prediction for braided fuselage during wing bending test

### SYSTEM ASSESSMENT TOOLS

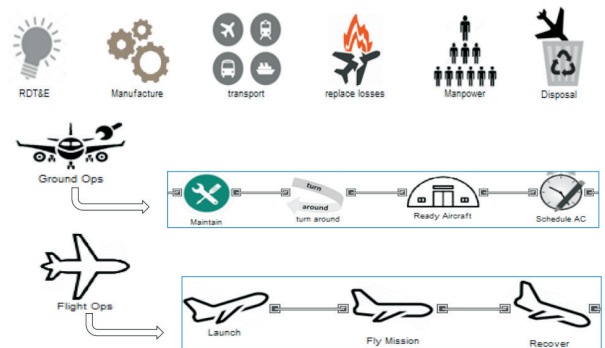
- ExtendSim – discrete event analysis tool simulating mission performance and cost analysis
- Advanced Framework for Simulation, Integration, and Modeling (AFSIM) – operations analysis
- CORE – Model-Based Systems Engineering (MBSE) tool for system architecture tracking and communication



Novel wing design for future LCAAT vehicles

### DESIGN/ANALYSIS TOOLS

- Fully parametric process for automatic design space exploration via optimization algorithms
- Computational Aircraft Prototype Syntheses (CAPS) scalable geometry creation and analysis
- SolidWorks solid modeling computer-aided design and engineering software
- FUN3D, CART3D, CBAERO, and Fluent aerothermodynamic analysis
- Abaqus and ANSYS structural analysis



Product line approach with periodic new model introduction vs. traditional depot maintain/retrofit practices

### MANUFACTURING DEVELOPMENT TOOLS

- Global-local FEA composite design
- Additive manufacturing (AM) rapid tooling
- Automated fiber preforming – Laystitch™ and ZSK tailored fiber placement machines
- Rapid consolidation/cure – RapidClave®
- Novel materials
- Multifunctional structures
- Process scale-up at Dayton Composites Center
- Supply chain development