Design of Military Vehicles with the Soldier in Mind:

Functionality and Safety Combined

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

Regina M. Rogers
Occupant Centric Survivability Project Lead
Ground System Survivability

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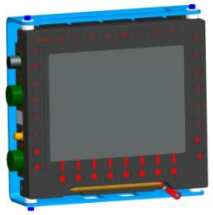
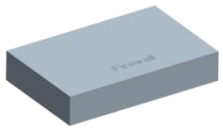
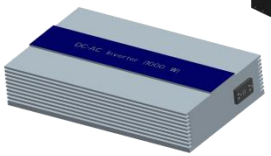
What does a Soldier NEED to Function in the Battlefield?

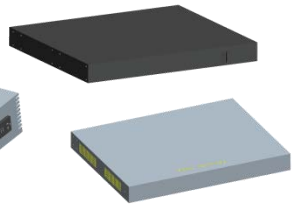
- Weapons System (control equipment)

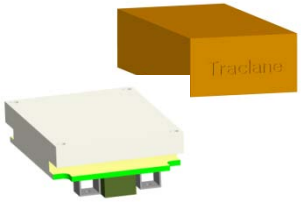
- Power/Data Architecture



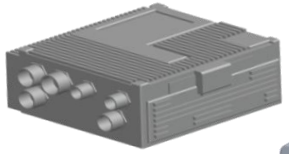


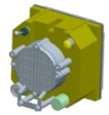


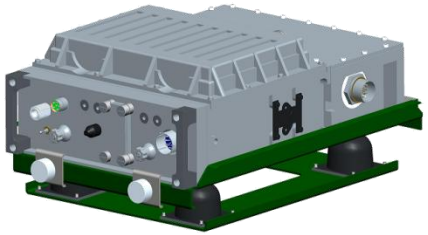


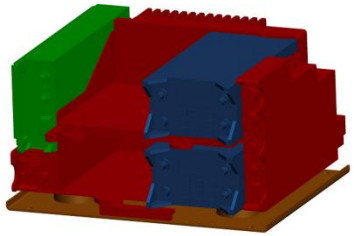


- Situational Awareness
  - Communications Equipment





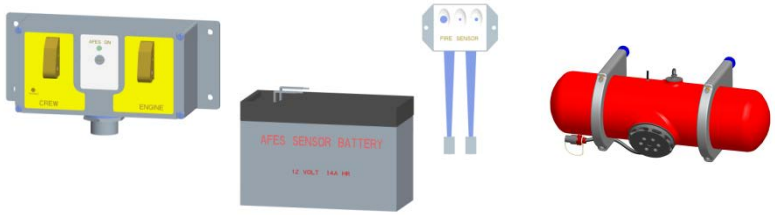




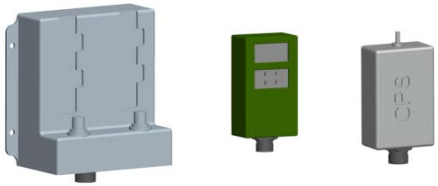
  - Day/Night Vision Equipment

What does a Soldier NEED to be Safe in the Battlefield?

- Fire Suppression System



- CBRN Protection System

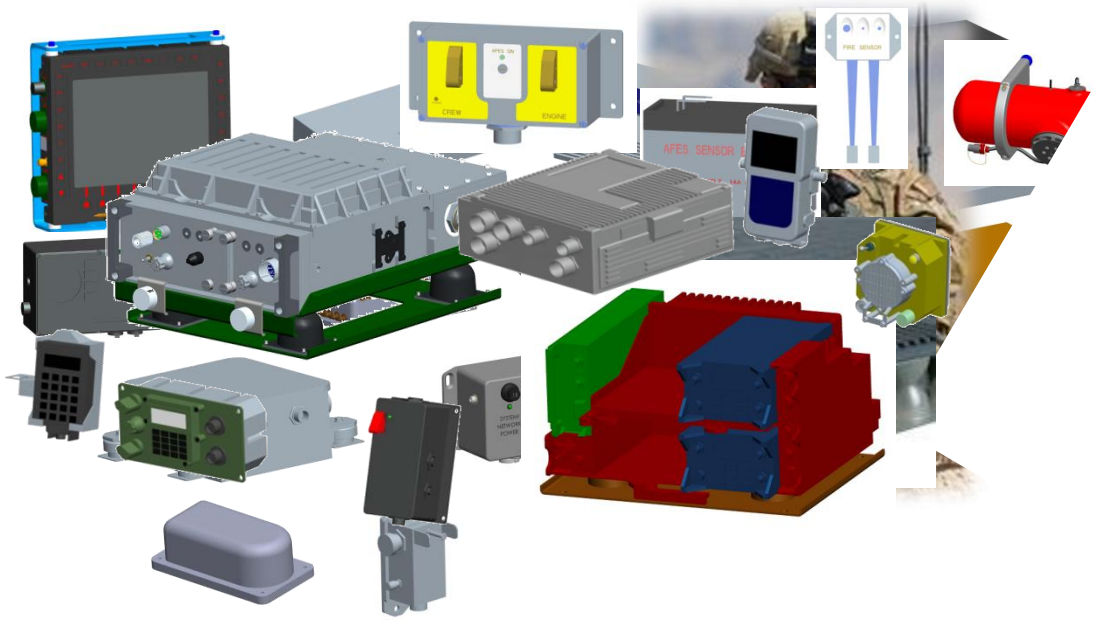


- Active Protection Systems (control)

- Seats / Restraints

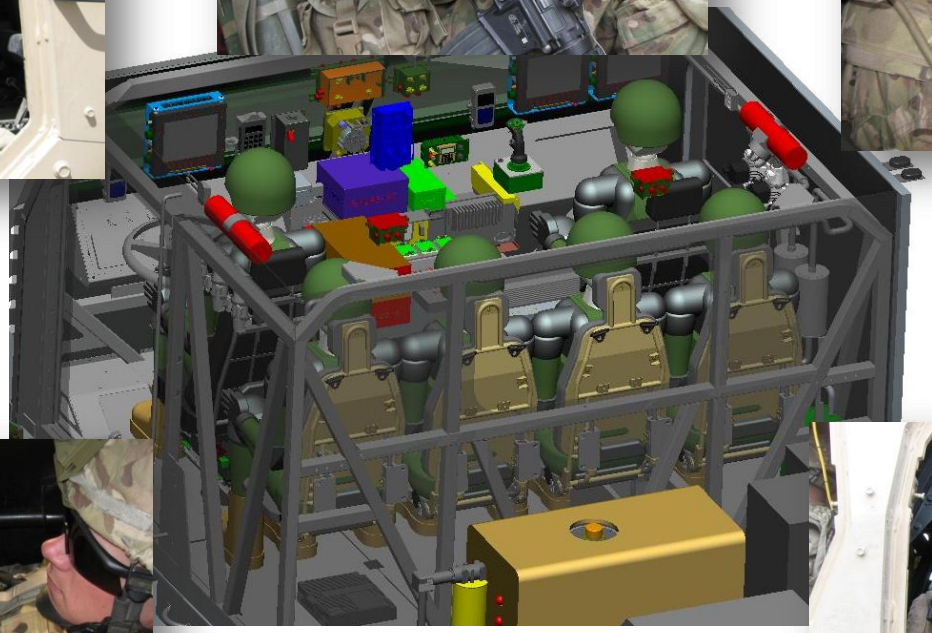
- Energy Absorption Materials

Current Approach to Military Vehicle Design: Combining Functionality and Safety

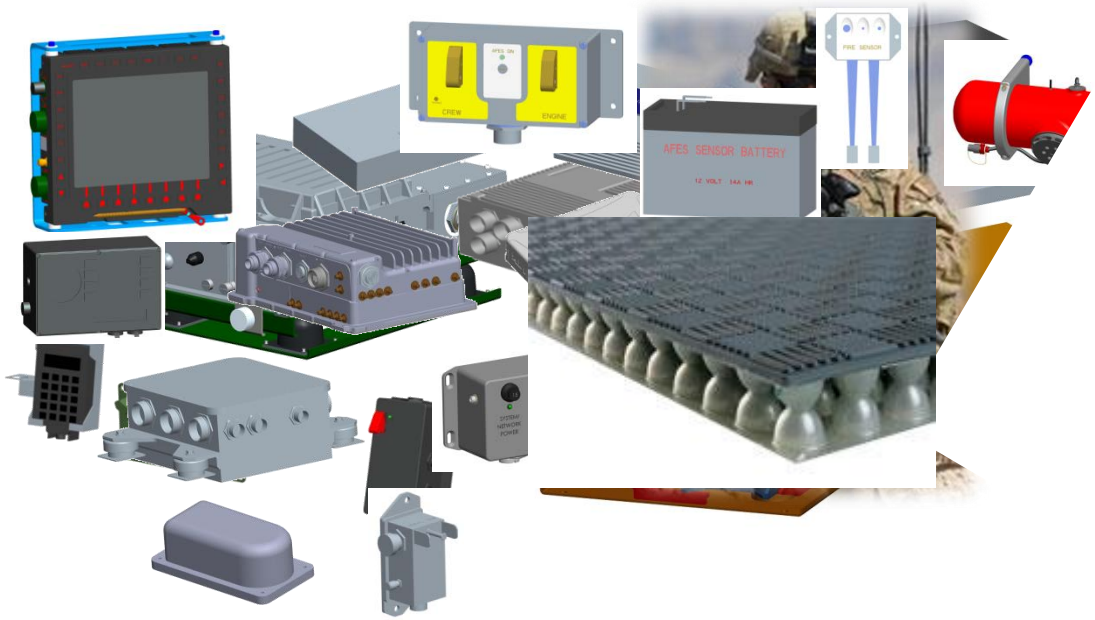


Current Military Vehicle Design Approach

What does a military vehicle look like using the current approach for vehicle design?

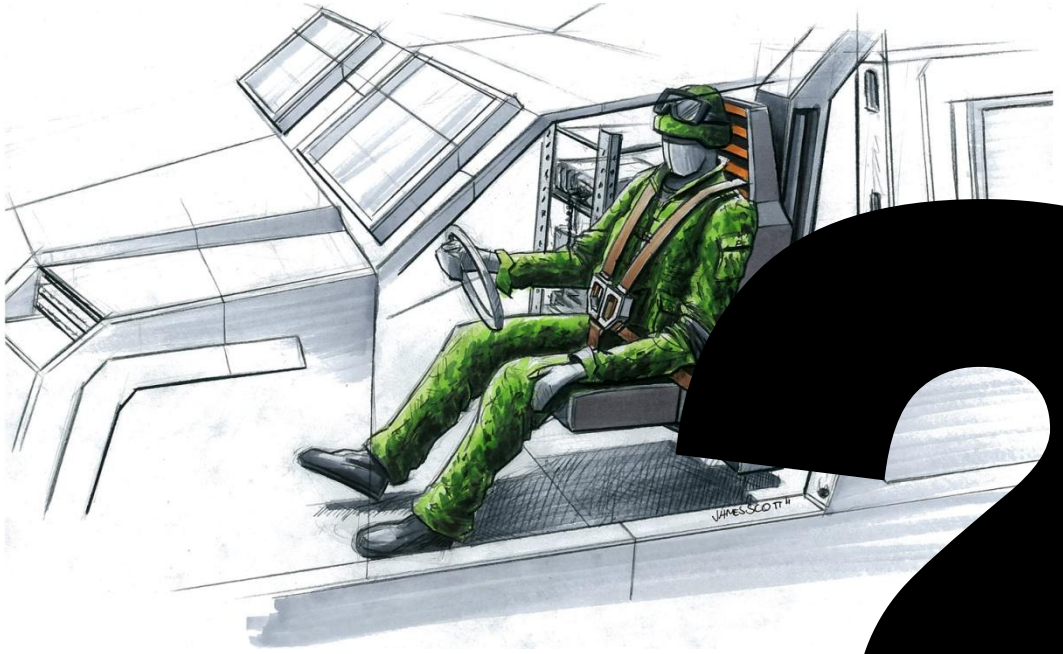


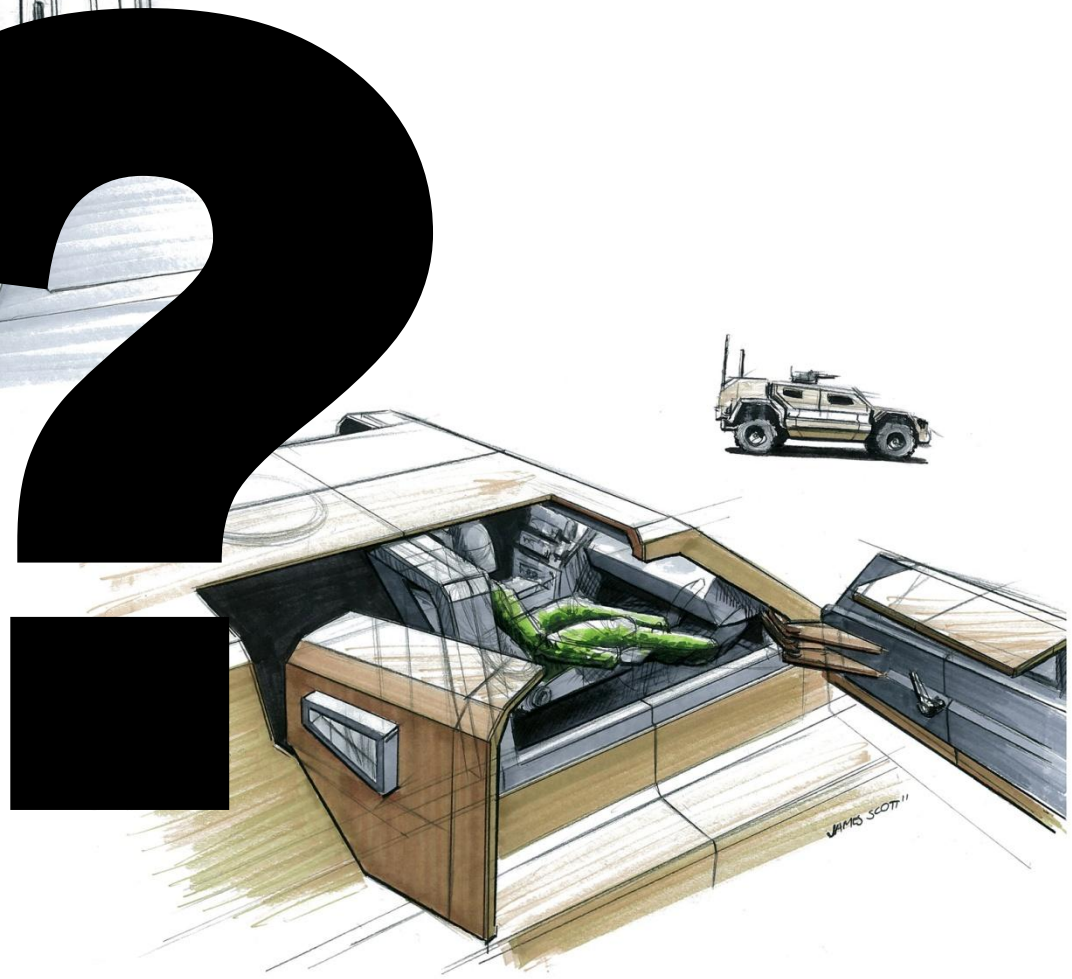
Future Approach to Military Vehicle Design: Combining Functionality and Safety



Future Military Vehicle Design Approach

What does a military vehicle look like using the <u>future</u> approach for vehicle design?





How Do We Realize a Vehicle Design that is both Functional AND Safe?

CAPABILITY GAP | **CURRENT CAPABILITY**

Blast Event ⟷ **Soldier** ⟷ **OCS Toolbox** ⟷ **Army Ground Vehicle Design** → **Production & Deployment**

Continuous Fleet Performance & Theatre Data Feedback Loop

Understand the blast event:
- Theatre Data
- Vehicle & Injury
- Battlefield Vehicle Forensic Teams & Attack Scene Investigation
- JTAPIC

Understand blast injury:
- Injury Mechanism
- Human/Soldier Response and Tolerance
- Live Human Anthropometry and Response
- Cadaver Testing

Translate event into quantifiable metrics:
- Injury Assessment Reference Values
- Vehicle Response – Force, Stress, and Displacement

Understand the Soldier and their Mission:
- Solider Population
- PPE and Gear
- Human Factors
- Needs /Requirements (TRADOC)

OCS Toolbox:
- Design Guidelines
- Component Specifications
- Sub-System/System Specifications
- Test Procedures
- MIL-STANDARDS

Occupant Protection Systems Integration Laboratory (OP SIL):
- Drop Tower
- Vertical Impact Test Simulator (VITS)
- Head Impact Protection (HIP)
- Linear Impact Sled (LIS)
- Multi-Axis Blast Simulator (MABS)
- Grayling
- Test Dummies
- Instrument Calibration
- WIAMan

VEHICLE M&S and LFT&E ⟷ COMPONENT M&S and T&E

MODELING & SIMULATION ⟷ TEST & EVALUATION

SYSTEM M&S and T&E ⟷ SUB-SYSTEM M&S and T&E

Soldier Domain:
- Advanced PPE and Gear

Exterior Technologies:
- Underbody Kits
- Panels, inserts, advanced materials
- Cargo/gear retention

Interior Technologies:
- Seats
- Ease-of-use Belts
- Energy Absorbing Materials
- Ingress/Egress

Sensing and Electronics Technologies:
- Black Box
- Internal Sensors
- Diagnostic Modules

Occupant Centric Survivability

THEATER DATA – VEHICLE & CASUALTY DATA

INJURY MECHANISM

INJURY ASSESSMENT CRITERIA

TEST DEVICE
(HYBRID III → WIAMan)

VEHICLE AND INJURY ASSESSMENT

SOLDIER

TECHNOLOGY INTEGRATION

SOLDIER POPULATION

PPE AND GEAR

HUMAN FACTORS

NEEDS & REQUIREMENTS (TRADOC)

MARKET SURVEY & TECHNOLOGY ASSESSMENT

DESIGN GUIDELINES, TEST PROCEDURES, AND MIL-STANDARDS

TECHNOLOGIES

- SOLDIER PPE & GEAR
- INTERIOR
- EXTERIOR
- SENSING & ELECTRONICS

MODELING & SIMULATION

TEST & EVALUATION

VALIDATE & ACCREDIDATE

TRANSITION TECHNOLOGY

OCS Mission: D4W - Design for the Warfighter

THANK YOU!

Regina M. Rogers
Occupant Centric Survivability (OCS)
Project Lead

Mobile: 586.219.8345
Office: 586.282.5121
Email: Regina.Rogers@us.army.mil

Christine M. Wodzinski
Occupant Centric Survivability (OCS)
Project Deputy

Mobile: 586.202.9045
Office: 586.282.0860
Email: Christine.Wodzinski@us.army.mil