



U.S. ARMY
RDECOM

Under-body Blast Methodology Development and Validation



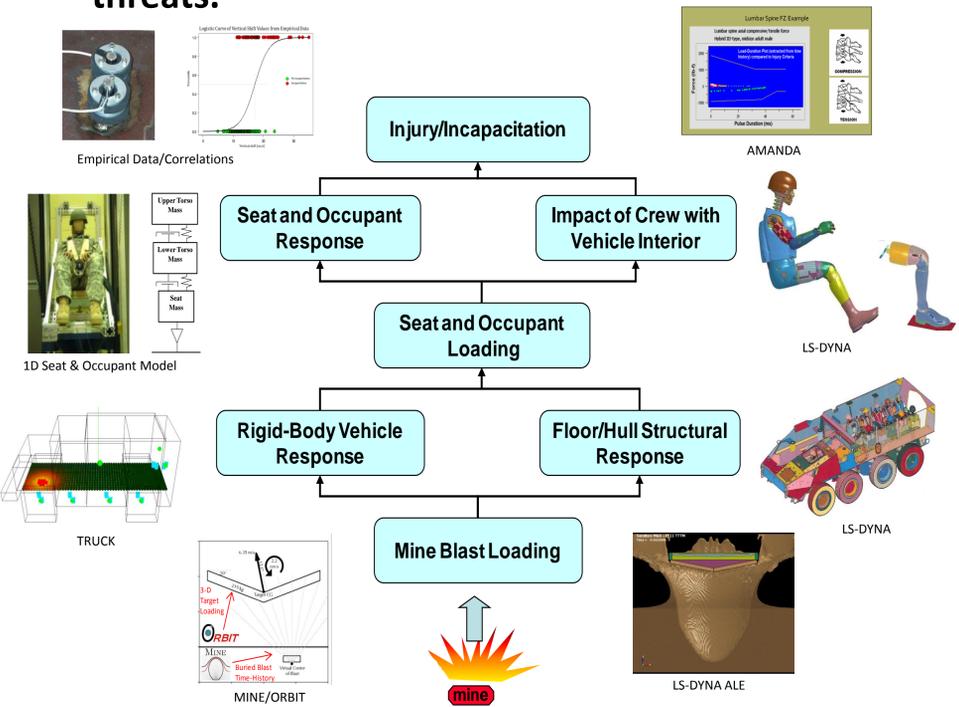
open
campus

S&T Campaign: Analysis & Assessment
Assessing Mission Capability of Materiel

Craig Barker, (410) 278-0214
Craig.s.barker.civ@mail.mil

Objective

- Develop a robust, efficient and accurate methodology—consistent with results from high-fidelity multi-physics software—for estimating vehicle and occupant vulnerability to under-body blast threats.



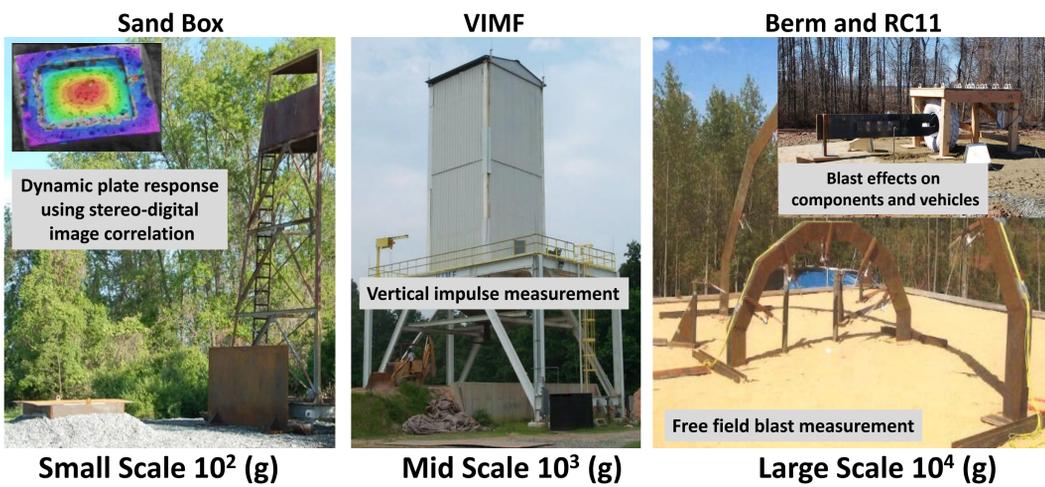
Breaking the problem down with a wide range of capabilities

Challenges

- Suitable instrumentation to provide data for loading model development and validation
- Complex phenomenology and variability of outcomes
- Computational efficiency

ARL Facilities and Capabilities Available to Support Collaborative Research

- Experimental facilities to study the effects of buried high-explosives on structures



- Experimental facilities to study the effect of blast-like loading on anthropomorphic test devices (ATDs) and blast-resistant seats



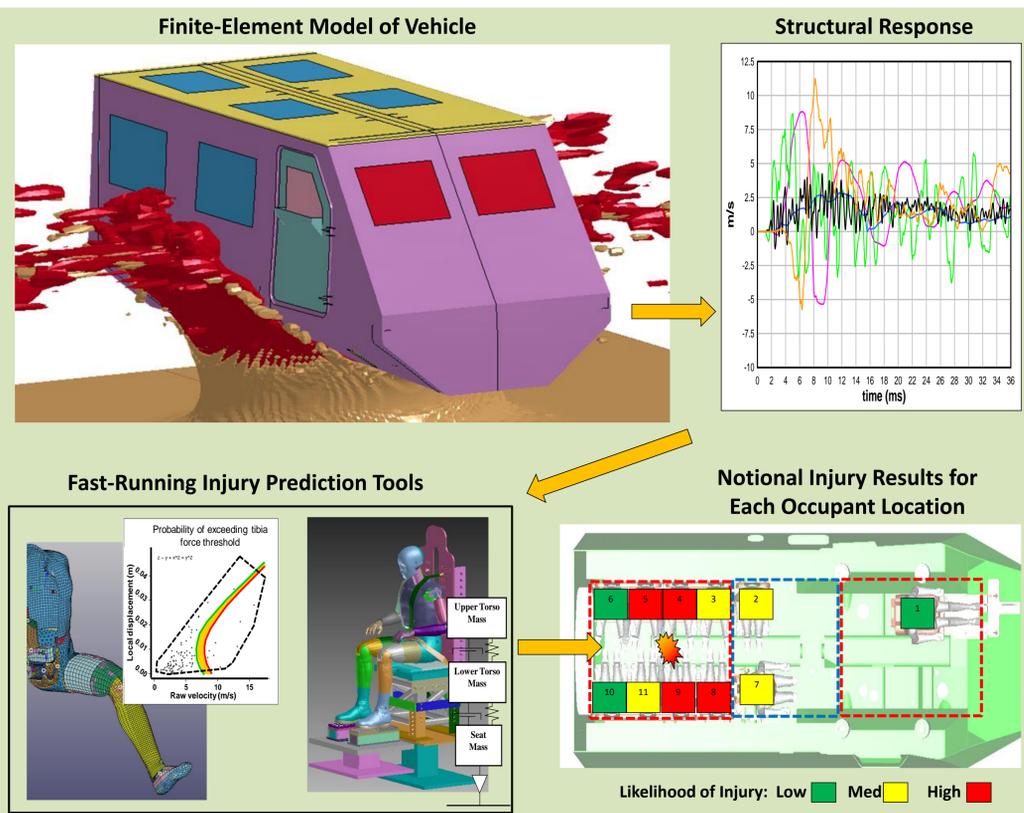
ATD on crew seating blast effects simulator



Lower leg of ATD on drop tower machine

Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration

- Advanced instrumentation methods that are sufficiently robust to capture the time and spatial distribution of buried blast loading on structures
- Advanced algorithms to develop meta models from extremely complex computational physics models
- Alternative methods for modeling complex soil and explosive interactions with vehicle structures; must be efficient, accurate and robust
- Automated techniques to develop complex meshes of vehicle structures



Developing fast-running methods to estimate injury