

# Under-body Blast Methodology Development and Validation

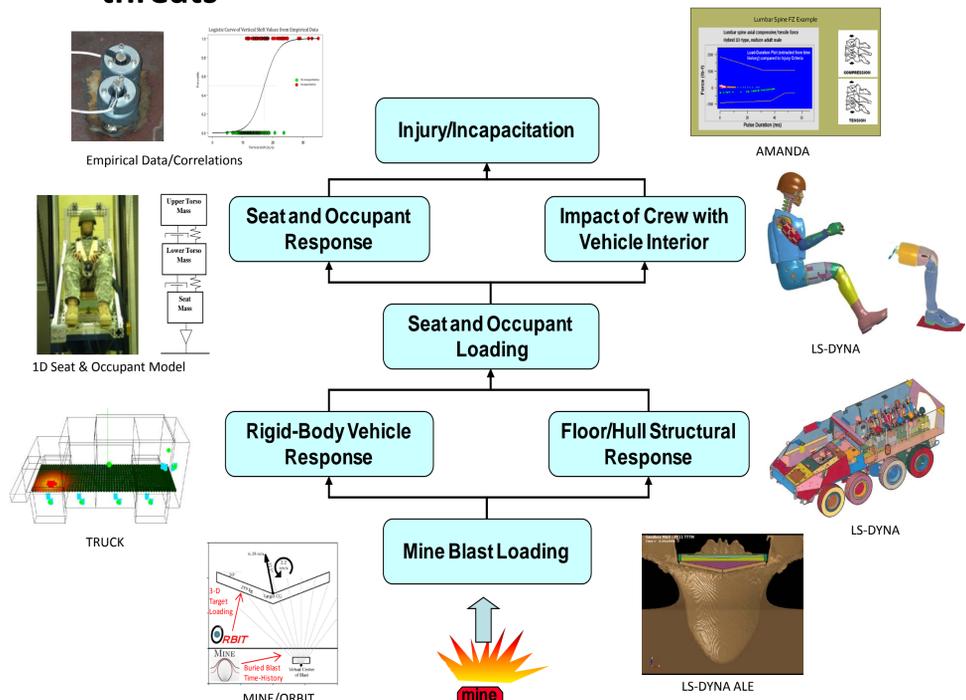


S&T Campaign: Assessment & Analysis  
Assessing Mission Capability of Materiel

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## Objective

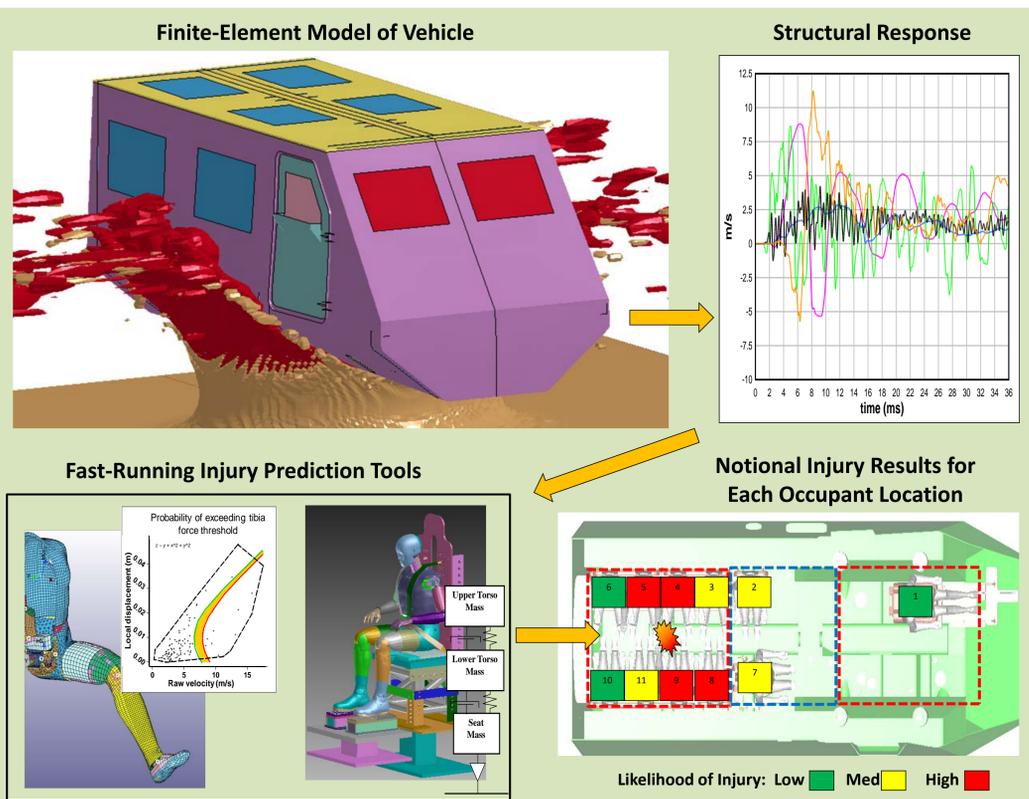
- Develop a robust, efficient and accurate methodology—consistent with results from high-fidelity multi-physics software—for estimating vehicle and occupant vulnerability to under-body blast threats



Breaking the problem down with a wide range of capabilities

## Challenges

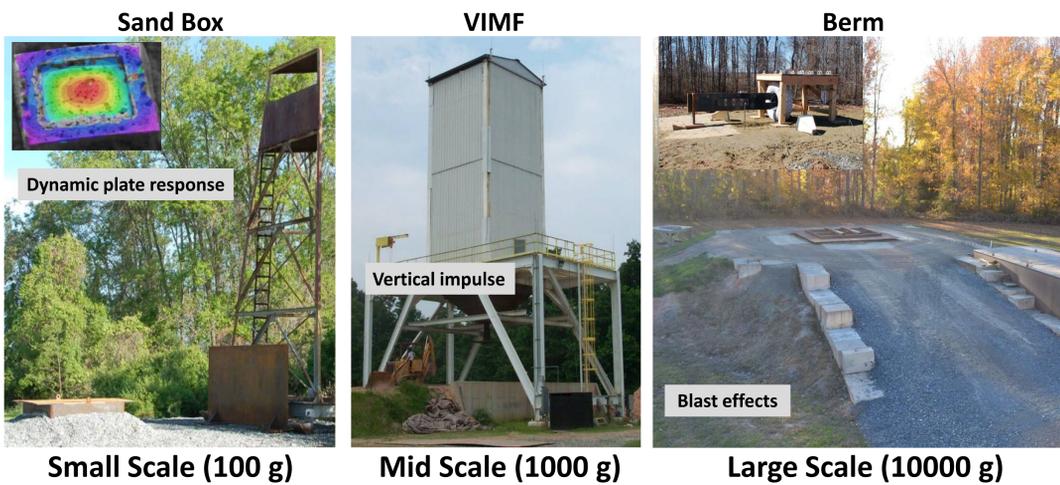
- Overcoming limitations of instrumentation for loading models
- Adequately addressing complex phenomenology and variability of outcomes
- Achieving computational efficiency



Developing fast-running methods to estimate injury

## 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 metamodels from extremely complex computational physics models
- Alternative methods for modeling soil and explosive interactions with vehicle structures; must be efficient, accurate and robust
- Automated techniques to develop complex meshes of vehicle structures