

# REVOLUTIONIZING LIGHTWEIGHT METAL MANUFACTURING

LIFT (Lightweight Innovations For Tomorrow), a Manufacturing USA® institute, designs and deploys advanced lightweight metal manufacturing technologies and implements educational programs to close the gap between research breakthroughs and commercialization.

Manufacturing USA, a public-private partnership with 14 manufacturing institutes across the nation, connects companies, academic institutes, non-profits, and local, state, and federal entities to solve industry-relevant advanced manufacturing challenges in new technology areas with the goals of enhancing industrial competitiveness and economic growth and strengthening national security.



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WITH LIFT

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## Technology Focus Area

**Lightweight metal manufacturing** provides the aerospace, automotive, shipping and defense industries with lightweighting solutions which increase fuel economy, reduce emissions, use less material waste and fewer components, and delivers new materials and improved processing technologies to save cost, reduce energy consumption, and extend the range and life of operations. LIFT focuses on addressing key metals manufacturing processes—melt processing, powder processing, thermo-mechanical processing, novel/agile processing, coatings, and joining and assembly—as well Integrated Computational Materials Engineering (ICME).

## Approach to Innovation and Collaboration

LIFT brings together partners needed to provide the industry with technology, innovation, and workers to capitalize on opportunities and growth potential in lightweight manufacturing. This is done through programs like:



**LIFT High Bay**, the nation's premier lightweighting applied research and development facility



**Education and workforce training** through investments in over 40 initiatives to develop and educate, skilled and ready workforce, competent and confident in using the new technologies being developed and deployed by LIFT and other Manufacturing USA institutes



**Fast Forge**, a tech development program that accelerates projects from breakthroughs to marketplace in 6-8 months

# COLLABORATIVE PROJECT EXAMPLES

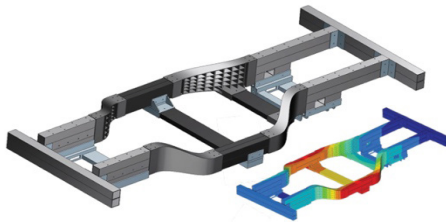
“By working with LIFT, we’ve proven our system is ready and able to be installed across the fleet to improve safety immediately. We’ve also investigated opportunities for future implementation, which reduce weight and improve vehicle payload and efficiency.”

– Chet Gryczan, President, Ricardo Defense Systems



**REDUCING HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE ROLLOVERS:** This pilot project retrofit Michigan National Guard vehicles with Ricardo Defense System’s optimized antilock braking system and electronic stability control to reduce High Mobility Multipurpose Wheeled Vehicle fatal rollovers. The system is now available for purchase by military units worldwide.

**DEVELOPING AND DEPLOYING THIN-WALL DUCTILE IRON CASTINGS FOR HIGH-VOLUME PRODUCTION:** Integrating and implementing improved methods and alloys to decrease wall thicknesses of ductile iron cast parts by up to 50% for implementation in the auto industry.



**LIGHTWEIGHT AFTER-MARKET CAR FRAME:** Designed in response to growing market need for alternative lightweight vehicle frame options for cars, the frame can also be adapted for military applications to lighten loads and increase fuel economy. The frame is easily morphed into any wheelbase, vehicle length, and width without requiring additional tooling, and assembly time dropped from as much as 40 hours to two hours.

**OPERATION NEXT:** This pilot provides high-level technical training to separating soldiers while they are still on active duty, moving them from deployment to career in the shortest time possible and connecting them to some of the more than half-million open jobs in precision machining and industrial technology.

“Our partnership with LIFT provides us the ability to not only showcase and demonstrate our technology, but also help other LIFT members achieve their lightweighting goals. We look forward to what’s next, now and in the future.”

– Steve Pegram, Vice President, Heller Machine Tools

“This is a new frontier for the U.S. This institute will deliver our next generation of global competitiveness and American advanced manufacturing. Lightweight metals are key to the future of American manufacturing capabilities.”

– Andre Gudger, (Former) Acting Deputy Assistant Secretary, U.S. Department of Defense