We shape and advance great ideas into viable solutions through GVSC’s Digital Physical Prototyping. This includes a suite of virtual and physical engineering tools to accelerate innovation by enabling rapid development and evaluation of both future vehicle concepts and current fleet upgrades. In the digital environment, GVSC evaluates technology solutions in virtual simulations prior to physical prototype builds. This allows us to deliver advanced capabilities to the warfighter faster and at less cost.

As integration experts, we have been able to form strategic partnerships with industry, academia and other government agencies to combine the best talents, incubate the best ideas and accelerate the most innovative technology for Soldiers and Marines who fight for our Nation's interests.
Leaders in Unmanned Ground Systems

Our unparalleled leadership in intelligent and autonomous ground systems R&D has made significant impacts in robotic operational capabilities. Recent unmanned ground systems initiatives include robotic mobility, crew station integration, autonomous navigation, embedded simulation, systems architecture, sensor technology, human-robot interactions and telematics.

With our Leader-Follower program GVSC engineers integrate robotic appliqué kits on tactical wheeled vehicles, providing the capability for a designated manned lead vehicle to lead a line of driverless follower vehicles—up to nine of them. On the battlefield, this gives the ground commander options in the employment of Soldiers and the execution of sustainment convoy operations, potentially reducing the number of Soldiers exposed to enemy attacks. Our semi-autonomous technology will be used and tested for the first time in an operational unit—the 15th and 41st Transportation Companies. Additionally, in cooperation with the Michigan Department of Transportation, we have demonstrated leader-follower truck convoys on Michigan highways, including across the U.S.-Canada Blue Water Bridge.

Extending the Reach of the Warfighter through Robotics demonstrates team unmanned aerial vehicles and unmanned ground vehicles to bring the future ground commander an adaptable, flexible, modular and smart capability that can evolve as quickly as needed to meet a constantly changing threat and environment.
Integrated Survivability Solutions

Our engineers apply exhaustive analysis in developing advanced lightweight armor to increase vehicle protection and reduce weight. Using collaborative partnerships, GVSC develops innovative engineering solutions to mitigate possible vulnerabilities against a variety of potential threats. Our scientists and engineers are developing active and passive armor capabilities, active protection systems, underbody blast mitigation capabilities, laser protection and various head and neck injury prevention technologies to protect vehicle occupants.

Mission Enabler Technologies-Demonstrator (MET-D) Vehicles

An infantry squad’s battlefield success depends on maintaining situational awareness of its surroundings and an enhanced communication capability. GVSC’s Mission Enabling Technologies Demonstrator leverages the latest technology in cameras, data display, graphical user interface, drive-by-wire capability, unmanned aerial vehicle-provided video, and advanced communications to help make our Soldiers and units more lethal, win wars, and come home safely.

Experimental Prototyping of the Next-Generation Manned Fighting Vehicle/Robotic Combat Vehicle platoon

Manned Vehicle Configuration

Robotic Combat Vehicles (RCV)
Power and Mobility

Battlefield power demands have grown exponentially during the past decade. Today’s ground vehicle systems use energy-intensive technologies that have dramatically improved warfighter operational capabilities and situational awareness, but have pushed vehicles to their size, weight and power output limits. GVSC and its collaborative partners are aggressively pursuing mature technologies to increase fleet energy flexibility and efficiency, and provide more power output without adding additional weight that degrades system performance.

GVSC’s prototype Advanced Combat Engine will be a 1,000-horsepower 4-cylinder engine with 15 percent greater fuel economy and a lower thermal burden than commercially available engines of similar power and torque levels.

Electrification

The Army’s drive to develop vehicle electrification technology has yielded advances in high-voltage electrical systems with enhanced capability while significantly reducing the electrical systems’ weight. GVSC is focused on developing a modular, flexible and adaptable vehicle architecture that can expand to meet future demands of all types. The value of an increasingly electrified vehicle platform also has driven research into fuel-cell and advanced battery storage technology.
Cyber Engineering

With the growing volume and sophistication of cyber threats to the ground vehicle environment, GVSC’s Cyber Engineering team continues to focus on technology that protects vehicle computers, networks, programs, and data from unintended or unauthorized access, change, or destruction.

As we move toward a future Army where deploying autonomous vehicle systems is a likely scenario and where Soldier lives depend on these systems, resiliency to enemy assaults such as communications jamming and GPS spoofing becomes one of the Army’s highest priorities. Robotics engineers at GVSC have begun a multiyear program to evaluate the cyber-resiliency of autonomously operating a vehicle in Australia from GVSC labs in Warren.

Facilities and Equipment

Headquartered in Warren, Michigan, and surrounded by automotive engineering expertise and more than 375 automotive R & D centers, we pursue state-of-the-art ground vehicle technology solutions. GVSC’s range of responsibilities include combat vehicles, all tactical vehicles, fuels, lubricants and water distribution systems.

GVSC provides:

- Leading-edge engineering research and development.
- Executive management of more than $400 million in research, development and engineering facilities, including more than 780,000 sq. ft. of laboratory space.
- State-of-the-art equipment able to handle component and large-scale, full vehicle system integration projects.

Our major labs support:

- Force Projection Technology
- Ground Systems Survivability
- Physical Simulation and Test
- Power and Energy
- Prototype Integration