We welcome your inquiries.
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As part of a multi-year initiative, SwRI will augment the existing proving ground with traffic devices and standard signage, radio communications equipment and representative obstacles to test and evaluate enabling technologies for autonomous vehicles. SwRI provides client-confidential test and evaluation services to DoD and the automotive industry worldwide.

Here, an SwRI development platform performs operational checks on the proving ground while metrics are monitored remotely.

Southwest Research Institute is an independent, nonprofit, applied engineering and physical sciences research and development organization using multidisciplinary approaches to problem solving. The Institute occupies 1,200 acres in San Antonio, Texas, and provides more than 2 million square feet of laboratories, test facilities, workshops, and offices for more than 3,000 employees who perform contract work for industry and government clients.
UGV

Vision: To participate in basic and applied research to advance the state of the art in unmanned ground vehicle performance, efficiency, safety, and cost for urban and extreme environments.

With over 50 years of experience in the automotive industry, Southwest Research Institute® (SwRI®) has the expertise and capabilities that benefit the UGV industry.

- **Robustness and Reliability**
  Extensive experience in manned and unmanned weapons systems gives SwRI an edge when developing rugged, highly reliable, fault-tolerant control systems.

- **Real-Time Operating Systems (RTOS)**
  - Vehicle management systems
  - Engine and vehicle structure health monitoring
  - Ground control stations
  - Hybrid vehicles
  - Traffic monitoring systems
  - Hardware-in-the-Loop (HIL) simulation

- **Terrain Modeling for Convoy Operations (Front Flap)**
  Recent internal research includes a simulation package to model sparsely manned convoys.

- **Model-Based Design**
  In compliance with SwRI’s ISO 9001:2000 processes, SwRI uses model-based design techniques as part of its system design process. Institute staff members create system models and controllers using the design tools and extensively test and evaluate their performance against the system requirements. The design tools produce software which eliminates the need for manual conversion and reduces development time.

- **UGV Capabilities**
  - Positioning: GPS and inertial navigation system (INS)
  - Integration: Commercial off-the-shelf (COTS) hardware and software
  - Intelligence: Layered control scheme
  - Perception: Obstacle detection and path acquisition
  - Communications: DSRC, JTRS, Software Defined Radio (SDR)
  - Command and Control: Smart user interface, drive-by-wire

- **Applications of Research**
  - Advanced Driver Assist Systems (ADAS)
  - Integrated Vehicle-Based Safety Systems (IVBSS)
  - Perimeter and border patrol
  - Automated inspection vehicles
  - Hazardous waste and explosive ordnance disposal
  - Emergency response vehicles
  - Autonomous and semi-autonomous convoy operations
  - Vehicle to Vehicle (V2V) and Vehicle to Infrastructure (V2I)

- **Software Languages**
  - C/C++
  - Java™
  - Microsoft® .Net™
  - MATLAB®, Simulink®

- **Facilities**
  - Proving Ground: 1.16 mile track
  - Urban Environment Vehicle Test Bed
  - Test Platform: Drive-by-wire, real-time controller, quad rack-mounted computers
  - Two million square feet of office and lab space

- **Off-Road Testing at SwRI**
- Interface to an SwRI Driver Assist System