Southwest Research Institute® (SwRI®) has been involved with Intelligent Vehicle Systems (IVS) since 1997. As an independent, non-profit, applied R&D organization, we provide engineering services to realize complex military, automotive, heavy truck, emergency response, and transportation systems utilizing our CMMI® Level 5 systems engineering processes.

With a staff of more than 30 electrical, mechanical, and computer engineers, most with advanced degrees, SwRI staff engineer state-of-the-art unmanned, cooperative, and active safety systems to solve real-world problems for our defense, automotive, construction/mining, de-mining, agriculture, and transportation clients – foreign and domestic.

### Unmanned Systems

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<td>On- and off-road navigation</td>
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### Cooperative Systems

#### Connected Vehicles

- Certification and interoperability
- Objective testing and IV&V
- System and software development
- Data acquisition system engineering
- Security implementation/analysis
- USDOT safety pilot participation

#### Cooperative Behaviors/Maneuvers

- Cooperative Convoy System (CCS)
- Cooperative platooning
- Cooperative sensor sharing
- V2V, V2I, and V2X interactions

#### Traffic System Modeling and Simulation

- Effects of technology deployment
- System-level effects modeling and analysis

#### Commercial Vehicle Operations

- CVISN and CVIEW consulting

### Active Safety Systems

- Sensor analysis and perception prototyping
- Sensor and algorithm benchmarking
- Automated driving
- Emergency brake notification
- Forward and side obstacle warning
- Forward collision warning and mitigation

SwRI defines an Intelligent Vehicle System as a system that enables a vehicle (car, truck, implement/tool, boat, submarine, train, robot, or aircraft) to perform an intelligent function by perceiving the environment and implementing a responsive action.

CMMI® is registered in the U.S. Patent and Trademark Office by Carnegie Mellon University
SwRI IVS programs range in duration from one- to two-week studies to multi-year, multi-million-dollar prototype development programs. SwRI is not a traditional automotive supplier; we do not sell products, and we are independent in all regards. Every project is focused on helping our clients solve real and challenging engineering problems.

As part of a long-held tradition, patent rights arising from sponsored research at the Institute are often assigned to the client allowing clients the maximum flexibility to reproduce, integrate and sell technology jointly developed. Intelligent Vehicle Systems programs conducted by the Automation and Data Systems Division regularly provide royalty-free, non-exclusive, non-transferable licenses to the patents and copyrights we have developed through our self-funded internal research and development program.

Collaboration throughout the R&D process is essential to ensure effective technology transfer. IVS regularly shares results and source code with our clients during the project. Clients are always welcome to work in our labs directly with our engineers and scientists.

Using world-class engineering and test facilities at our San Antonio, Texas, headquarters, SwRI has the ability to perform all stages of systems development. Our laboratories, consisting of more than 10,000 ft² (930 m²), house:

- Three software development and engineering labs to compartmentalize program areas
- Meeting facilities adjacent to IVS development labs to accommodate more than 25 people
- Six vehicle bays, including two that can accommodate two 35,000-lb vehicles more than 12 feet (3.6 m) high and 26 feet (7.9 m) long
- State-of-the-art measurement systems
- Full GPS re-radiation
- Environmental, vibration, and EMC chambers

A 200-acre (80-ha) tactical off-road range and a paved oval automotive test track >1 mile (1.6 km) with a fully equipped multi-lane intersection are adjacent to the IVS laboratories.

SwRI IVS also maintains a fleet of test vehicles that range from small ATVs to a full-size Class VIII tractor-trailer. The IVS fleet includes several fully actuated, fully autonomous platforms. These vehicles are available for client programs.

**Points of Contact**

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  - Cooperative Systems:  
  - Unmanned Systems:  
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