



World's most established vehicle simulation platform enables accelerated engineering throughout the complete product design process

CarSim delivers the most accurate, detailed, and efficient methods for simulating the performance of passenger vehicles and light-duty trucks. With more than twenty years of real-world validation by automotive engineers, CarSim is universally the preferred tool for analyzing vehicle dynamics, developing active controllers, calculating a car's performance characteristics, and engineering next generation active safety systems.

With manufacturers facing compressed product development cycles, CarSim provides an intuitive set of tools for engineers to quickly evaluate complete vehicles, automobile sub-components, and active controllers in complex, simulated driving environments.

CarSim keeps up to date with emerging trends in the transportation industry with frequent updates that include features such as: sensors and traffic vehicles for developing active safety systems, interfaces to 3rd party powertrain simulation tools, and Vehicle-to-Vehicle and Vehicle-to-Infrastructure wireless communication protocols.



CarSim's Intuitive Visualization and Plotting Tools

CarSim Applications

- ABS Braking
- Electronic Stability Control
- Adaptive Cruise Control
- Active Suspensions
- Electronic Power Steering
- Autonomous Driving
- Anti-sway Trailer Hauling
- Rollover Detection
- Hybrid Powertrains
- Driving Simulators
- ADAS Technologies
- Roadway Engineering
- Vehicle-to-Vehicle V2V
- Vehicle-to-Infrastructure V2I
- Fuel Economy Studies



High Fidelity Vehicle Models: CarSim includes detailed math models for all combinations of vehicles with independent, solid axle, and twist beam suspensions. Optional features in the math models add degrees of freedom to handle one and two axle trailers, flexible chassis frames, and flexible powertrain mounts.

Modular Vehicle Definition: automobile sub-systems are defined with parameters and tables that can be obtained from published data, engineering tools, and test rigs. When data is not available, you can use the real-world data provided in our sample datasets. CarSim's modular, parameter-based design approach lets you modify parameters and run simulations any time during the design cycle.

Automobile Performance Metrics: CarSim provides open-loop and closed-loop driver models with advanced features to help engineers quickly discover a vehicle's limit capabilities or its optimal path through a complex maneuver. These technologies are demanded by manufacturers who must certify compliance with worldwide ISO and ECE stability control regulations.

Integrate your own technologies using standard design tools: Mechanical Simulation provides seamless interfaces to other standard simulation and design tools such as Simulink and LabVIEW. Advanced users can develop stand alone technologies using Visual Studio and CarSim's API.

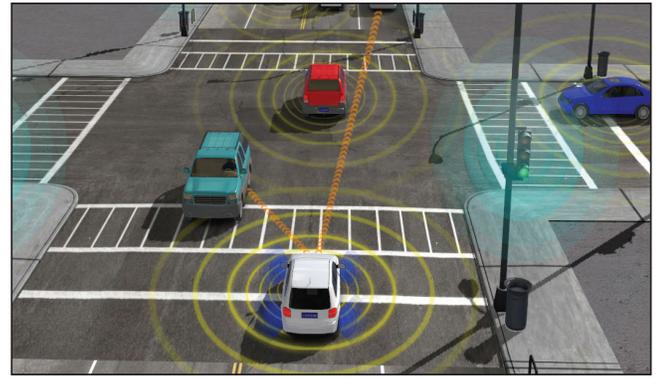
VS Commands: this powerful scripting language provides tools to automatically control test runs, extend the vehicle model, control complex driving maneuvers, and model auxiliary sensors.

Top Reasons Engineers Select CarSim

- CarSim is a standalone application. It does not require any other software to perform simulations.
- CarSim has a standard interface to MATLAB/Simulink.
- CarSim is used extensively by 7 of the 10 largest automotive OEMs.
- CarSim allows users to build complex scenarios and test event sequences.
- CarSim can scale from:
 - Software-in-the-loop to
 - Model-in-the-loop to
 - Hardware-in-the-loop to
 - Driver-in-the-loop
- CarSim has an intuitive user interface and powerful analysis tools.
- CarSim supports vehicle sensors and interactive traffic for V2V and ADAS development.
- CarSim includes numerous example vehicles, roads, and procedures to assist first time users.
- CarSim is the easiest and most productive vehicle simulation tool on the market.
- CarSim, TruckSim, and BikeSim have over 3,500 active users around the world at OEMs, suppliers, and leading universities.



Closed-loop driver model and detailed road profile



Sensor and traffic features for ADAS development

Data Driven Product Design

From conception to product launch—CarSim provides sophisticated tools to streamline your design, engineering and testing procedures. With CarSim, you can quickly transition between product development tasks by reusing vehicle parameters and test procedures implemented in previous steps.

CarSim supports standard engineering tools which allow you to integrate your own technologies into your simulation environment. CarSim's support for standard HIL platforms allows you to choose the best hardware for your real time application—without locking you into expensive, unproven hardware/software combinations.

CarSim is an economical tool for engineers who use multiple software tools and must produce results quickly. CarSim features an intuitive user interface, online help, and a complete set of example vehicles, 3D roads, and documented test procedures and plots.

Bundled Data Sets

- 15 example test vehicles
- 25 roads and test tracks
- 150+ test runs with comprehensive design notes

Engineering Tools

- Interactive 3D Visualizer
- Engineering plots
- Spectrum Analyzer
- Linear Analysis

Integration Technologies

- Microsoft COM API
- Excel import and export

Control Development Support

- MATLAB/Simulink
- LabVIEW
- ASCET
- Visual Studio

CarSim RT Supported HIL Platforms

- dSPACE
- National Instruments
- Opal-RT
- ETAS
- Fujitsu-TEN
- A&D RT-Linux

Tire Models

- Combined slip
- Extended shear with camber
- Pacejka 5.2
- MF-Tyre
- MF-Swift (optional)
- COSIN FTire (optional)

VehicleSim (VS) Commands

- Powerful programming language
- Automate complex driving maneuvers
- Create new variables and imports
- Add differential equations

Visualizer Features

- Data driven heads-up-display
- Synchronized plotting
- Driver mirrors/multiple cameras
- Tracking camera
- Overlay compare of multiple tests
- Ghost vehicle path
- Photo realistic, user defined driving environments—trees, buildings, signs, textured roads.
- Tire skid marks and tracks
- Sounds—engine, wind, and tire

Optional CarSim Modules

- Trailer
- Frame Twist
- Sensors
- AVL Cruise Interface
- Powertrain Mount Model
- Driving Simulators