

## Virtual Reality: The next best thing to real life

- How can students safely experience realistic traffic situations?
- How can you lower the cost of driving lessons?
- How do you practice in sunshine, rain and fog in a single lesson?
- How can you start driving lessons at age 17?

VSTEP has developed a unique driving simulator that allows driving students to experience real-life traffic situations safely, on-demand and at significantly lower cost. VSTEP's 270-degree simulator combines leading edge hardware and software to obtain a near real-life driving experience without the expense, time and hassles of real-life driver training.

To be effective, a driving simulator must offer a driving experience equivalent to a real car. VSTEP has combined a cylindrical 270-degree projection screen with a real car interior to realise the most realistic virtual driving experience. The simulator is a learning tool for training basic technical driving skills before getting into a real car, as well as for practising time-consuming and complex traffic situations throughout the driving course.

## 270-degree field-of-view increases insight in traffic situations

VSTEP's driving simulator features a unique curved screen, which provides a smooth 270-degree field-of-view. The student sits in the centre of the cylindrical screen in the interior of a real car. The 270-degree projections immerse the student in the traffic situation and allow him to see approaching traffic coming from all sides.



Cylindrical screen offers 270-degree field-of-view



Autonomous traffic makes every intersection different



View from within the car

As a result, he learns to look over his shoulder when moving lanes or turning. This unique field-of-view ensures that the student not only learns the right driving procedures, but also adopts the correct 'looking behaviour' during manoeuvres. Most driving simulators are unable to train this important part of driver training, because they provide a 180-degree field-of-view or even less. Moreover, research has shown that people can orientate themselves much better in virtual environments with curved projection than with flatscreens used by most other low-cost simulators.

## Simulator supports practical driving training

The lessons in the simulator complement practical driving lessons. The student learns basic car handling and control skills in the simulator, before starting practical driving lessons in a car. Integrated with the practical lessons, the student also trains complex traffic situations in the simulator, plus special skills like driving in difficult weather conditions. A built-in virtual instructor guides the trainee through the lessons, without the need for a full-time human instructor. After each module, the trainee receives a detailed assessment of his performance. The overview below shows the topics of the driving lessons currently offered.

Car Handling & Control	Complex Traffic Situations	Special Conditions *
<ul style="list-style-type: none"> <li>• Starting and switching off the engine</li> <li>• Pulling away and braking</li> <li>• Scanning a traffic situation</li> <li>• Steering</li> <li>• Staying correctly positioned on the road</li> <li>• Changing gears and clutch control</li> <li>• Maintaining a safe distance</li> </ul>	<ul style="list-style-type: none"> <li>• Negotiating traffic</li> <li>• Junctions</li> <li>• Parking</li> <li>• Changing lanes</li> <li>• Overtaking traffic</li> <li>• Motorways</li> <li>• Roundabouts</li> <li>• Urban driving</li> </ul>	<ul style="list-style-type: none"> <li>• Night driving</li> <li>• Fog</li> <li>• Rain</li> <li>• Negotiating hazardous situations</li> </ul>
		* Under construction

## Driving lessons at lower costs

VSTEP's driving simulator allows driving schools to offer cheaper driving lessons, without reducing overall profitability. The cost of one hour in the simulator is much lower than a practical lesson in the car, as the simulator consumes no petrol and requires no full-time instructor. Studies have shown that simulators allow students to learn up to three times faster than in traditional driving training. The virtual driving lessons in the simulator can reduce the number of practical driving lessons up to 40%, offering an attractive cost saving for both the driving school and the trainee.



Driving under different weather conditions

## Simulator specifications

Screen:	Cylindrical 270-degree projection screen (diameter 310 cm)
Computers:	One PC with two 3D graphics cards, running Windows XP
Projection:	Three XGA projectors
Car hardware:	Real car interior: steering wheel (force-feedback under development), speedometer, RPM meter, fuel meter, seat belt, light switch, indicators, pedals, gear box, hand brake, engine sound vibration
Sound:	3D sound system with 5 speakers
Software:	Autonomous traffic, virtual instructor, personalised assessment, 8 hours of driving lessons based on Dutch RIS method



Basic car handling lesson



Practicing night time driving in different settings



270-degree screen provides an immersive experience

## Benefits

- Unique cylindrical projection screen offers a smooth 270-degree field-of-view
- Seamless integration with practical driving lessons
- Reduces the cost of lessons
- Virtual instructor and personal assessment
- Driving in different weather types, daytime and nighttime
- Any traffic situation and environment can be simulated
- Usable with and without a driving instructor
- Sensation of movement, thanks to vibrating chair

## Contact

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