

Emergency Rides



1. General

Operational driving with fire trucks, police cars or ambulances is not comparable to the usual challenges posed by regular traffic situations. In case of an emergency, every minute counts. Ambulance men, policemen, emergency physicians and firemen often have to drive at a tearing pace in order to arrive in time at the target location. Rides with special rights signals call for outstanding concentration and driving skills as well as sound knowledge of the legal situation. Using the software package "Emergency Rides" drivers can be trained for these requirements.

Using the simulator, even young and inexperienced drivers can be confronted with these challenges. They can put their theoretical knowledge into (virtual) practice or can extend their experience gained elsewhere. One thing is certain: An experienced driving style, particularly in precarious situations, is the best warrantor for accident free driving.

2. Conception

The simulator program is designed to support theoretical training. The length of training rides is adjusted to an approximate simulator time of 10 minutes per driver and a class size of 5 to 10 persons.

Each training session at the simulator consists of a driving phase and a subsequent analysis phase. The driving phase takes approximately five minutes. During the ride the trainer does not have to speak to the driver. In contrast to a real ride, there is no risk of injury and the driver can be allowed to make mistakes in order to learn from them. After the ride, the trainer can analyze and comment the ride using the "Replay" tool, which combines a video reproduction of the ride with diagrammatic analysis aids. In particular, he can elaborate on theoretical lessons learned and practical experiences made.

If desired, it is an additional advantage of the simulator, that the whole class can watch the ride and can then be included in its analysis.

3. Simulator Hardware Requirements

The software package "Emergency Rides" can be used with Foerst driving simulators for either passenger cars or trucks. A sight system with three screens is obligatory. For detailed information and pricing refer to the main catalogues and the corresponding price listings.

4. Handling

The program is controlled using an operation unit with (at least) two buttons. Using it, the trainer can select the desired scenarios from a menu and also control the replay in the analysis phase following the ride. The handling is designed for maximum simplicity. It is easily comprehensible and field-tested.

Flashing blue light and siren are usually turned on and off using two push buttons. If a converted real car simulator contains specialized operational elements for this purpose, they are of course used. Please note that even in this case the blue light and siren functionality is only available with the "Emergency Rides" program.

Instead of starting the scenarios from the expert menu, car simulators offer an alternative user interface in form of a curriculum module (c.f. section 7).

5. Scenarios

This section briefly explains the scenario. The focus lies on rough content and available options.

5.1. Course of Action

Each ride takes approximately four to five minutes (depending on the driver's speed). There are more than ten different scenarios to choose from.

The course of the road consists of inner city areas, rural roads with villages and motorway sections.

Most scenarios are reproducible. Therefore, the trainer knows in advance, with which situations the trainee will be confronted and can prepare for corresponding comments and explanations. In addition, the trainees' performances can be compared (if desired).

In addition, there are four scenarios with randomized traffic. They are reproducible with respect to the course of the road, but not with respect to the occurring traffic situations.

All scenarios pose the task to reach a destination given by a navigational system as quickly as possible. Of course, unreasonably dangerous situations or even accidents should not be provoked. During the ride, different events occur and the simulated traffic reacts in different ways to the use of the siren.

The scenarios can be driven at different weather conditions. The available options are:

- Nice Weather
- Fog
- Rain
- Twilight
- Night
- Snow
- Winter¹



The simulated vehicle is an emergency vehicle of the 3.5t type. It can be driven using either an automatic or a manual gearshift.



¹ Winter means snowy landscape, but cleared roads. Most of the time, the road properties are very similar to those at nice weather. Depending on the selected scenario, additional hazard situations may occur.



The following traffic situations occur:

A) Crossing junctions:

- With or without traffic lights
- At red or green lights
- With different traffic densities
- With sight obstructions by large waiting vehicles

B) Misbehaviour of other vehicles:

- Sudden braking
- Adverse stopping positions
- Ignoring special rights



C) Miscellaneous hazard sources:

- Pedestrians
- Bus stops
- Multi-lane roads
- Roundabout
- Blind hilltops
- Traffic jams (e.g. in front of traffic lights)
- Emergency corridors
- Blind curves
- Tram
- Low bridges
- Adverse weather



5.2. Scenario Abstracts

This section lists the course of events for the scenarios with reproducible traffic.

Variant 1

- Start at a depot.
- Rural road
- Village entry
- Crossing a junction: Car from the right ignores the special rights
- Turning left on a junction with dense traffic
- The car in front of the driver reacts to the siren with an emergency braking. Only then it drives to the right road border
- An emergency corridor is formed, but one vehicle reenters the road
- Crossing a junction: Car from the left ignores the special rights
- Arrival at the destination

Variant 2

- Start at a depot
- Rural road with a depression
- Before a hilltop there is a slow truck. Overtaking is very dangerous due to the obstructed sight
- Turning right at a junction: Car from the left ignores the special rights
- An emergency corridor is formed, but one vehicle reenters the road
- Crossing a junction: Car from the right ignores the special rights
- Arrival at the destination

Variant 3

- Immediately after starting, a car from the right ignores the driver's right of way
- A car suddenly starts from the road border
- The car in front of the driver reacts to the siren with an emergency braking. Only then it drives to the right road border
- Arrival at the destination

Variant 4

- Start at a bus stop
- A truck should be overtaken. Higher level of difficulty due to an oncoming truck
- An emergency corridor is formed, but one vehicle reenters the road
- A truck has broken down in a curve. It blocks the sight on the oncoming traffic, which tries to pass the truck
- Crossing a junction: Car from the right ignores the driver's right of way
- Crossing a multi-lane junction with dense traffic with partially inadequate reaction to the special rights signals
- Crossing a roundabout
- Turning left at a junction with red traffic lights
- An emergency corridor is formed, but one vehicle reenters the road
- Arrival at the destination

Variant 5

- Rural road through sight blocking woodland. A truck ahead cannot be overtaken (without taking large risks)
- Very slow vehicle behind a hilltop
- A child crosses the road
- A parking truck starts into the road
- Very curvy and rangy road. A truck and a bicyclist impede the ride
- Arrival at the destination

Variant 6

- Entering a motorway
- Traffic jam #1: An emergency corridor is formed, but one car stays on its lane.
- Traffic jam #2: An emergency corridor is formed, all vehicles behave correctly.
- Traffic jam #3: An emergency corridor is formed, but one car reenters the corridor.
- Traffic jam #4: An emergency corridor is formed, but one car stays on its lane.
- Arrival at the destination

Variant 7

- Scenario without any special hazard situations. The ride starts on a rural road, passes an industrial area and ends in an urban area.

Variant 8:

- Shortly behind a traffic light, a tram crosses the road at a point with restricted sight
- The driver is ordered to turn right. Parallel to the road a bicyclist is on collision course.
- The driver can right-overtake a car on a bus lane. This car turns right at the next junction, crossing the driver's way
- Arrival at the destination

Variant 9:

- The navigational system suggests a route under a low bridge. The driver should recognize the problem and choose an alternative route (the navigation system adapts to the changed route)
- A pedestrian crosses the road
- The driver is ordered to turn right. He has to cross a bus lane with a bus on it.
- Crossing a junction at red traffic lights: Car from the right ignoring the special rights. This car cannot be seen early because of other vehicles.
- Arrival at the destination

Variant 10:

- Start at a motorway service station
- An emergency corridor forms on a motorway with three lanes. One car reenters the corridor.
- Arrival at the destination

Variant 11:

- The driver starts to a winter ride (choose “Winter”, “Snow” or “Night” – the ride is boring under other weather conditions). The ride starts with a non-critical rural road section.
- Shortly before the destination, the road becomes extremely slippery, which also was the reason for the observed accident. The alert driver should recognize the changed road surface from the otherwise cleanly cleared roads before. He should slow down and approach the destination very carefully
- Arrival at the destination

Variant 12:

- Start in a city.
- Behind a junction, the road is blocked. The driver must turn around. Behind the emergency vehicle, another car has stopped, which can easily be overlooked.
- The rest of the scenario has no particular hazard situations.
- Arrival at the destination

Variant 13:

- The driver starts during a thunderstorm (choose “Rain” – the ride is boring under other weather conditions).
- The ride starts with a non-critical section.
- The driver approaches a flooded underbridge, which is clearly indicated by signs, but easily underestimated in its dangerousness. The driver should turn around and continue following the navigation system. If he fails to do so, the scenario ends with a sunken emergency vehicle.
- Arrival at the destination

6. Analysis

After the trainee has completed the ride, the trainer can use the following tools in order to comment the ride and discuss the trainee's mistakes.

6.1. Recording of the ride (Replay)

The whole ride can be reviewed using the "Replay". The replay speed can be adjusted including stopping and rewinding. This allows to discuss special situations with the help of a frozen scene. The point of view can be changed.

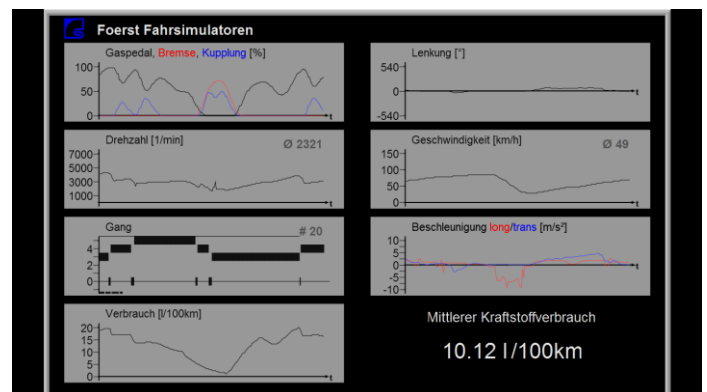


Replay Functions: Start, stop, fast forward, rewind.

Camera Perspectives: Driver's perspective, top view, helicopter perspective.

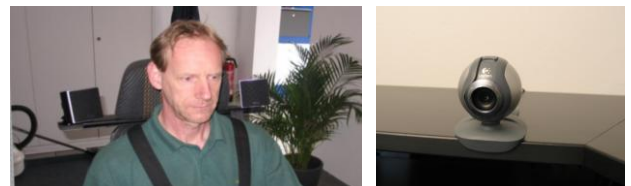
6.2. Diagrams

The most important vehicle parameters like speed, gear, pedal positions or revolutions per minute are displayed in the form of diagrams. These diagrams are displayed during the replay and support the trainer in analyzing the driving behaviour.



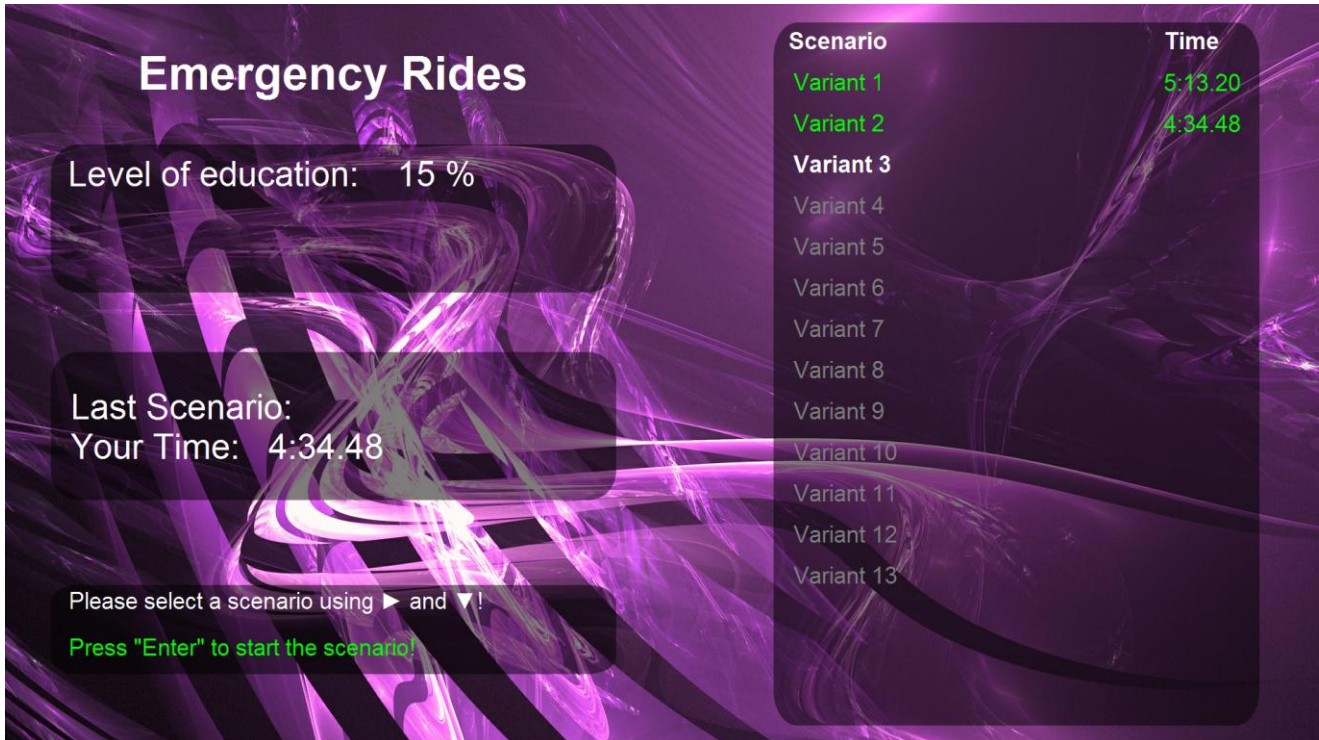
6.3. Recording of the Sight Behaviour

During the ride the driver's face is recorded by a camera. During the replay, this recording is displayed synchronized with the ride's recording. This technique allows analyzing and commenting the driver's sight behaviour with respect to side roads and mirror usage. For obvious reasons, the function is only available, if the simulator is equipped with the optionally available camera.



7. Curriculum “Emergency Rides”

Car simulators can usually be used as driving school simulators and only occasionally for the purpose of emergency training. In this case it can be advantageous to have a user interface, which more closely resembles that of the other software modules in use. The trainer then does not have to cope with the expert menu, but finds a familiar user interface on insertion of a suitably prepared trainer account card.



Alike the other curriculum modules, this interface can easily be navigated by the trainee himself, but in this case an appropriate ride evaluation must be done by a qualified human trainer. The overview screen only shows the shortest times for each scenario, while other evaluation criteria are completely neglected.

The offered scenario choices correspond precisely to the scenarios with reproducible traffic described in section 5.2. The scenario's options cannot be set and almost all scenarios are driven at nice weather. Exceptions from this rule are only those scenarios, which need special weather conditions to make sense.