PASSENGER CAR

POLICE - AMBULANCE & FIRE EMERGENCY

DRIVER TRAINING SIMULATORS

OVERVIEW: Sydac's car simulator provides a safe and economical solution for enhanced driver training and assessment for both novice and experienced drivers. Drivers are immersed in realistic situations allowing them to experience all aspects of driving, both the rare and everyday events which can threaten their safety and the safety of others on the road.

Simulation based training provides real benefits to road users and the community due to;

- Reduction of accidents through better preparation of drivers to manage hazardous situations
- Better preparation for learners and for those returning to driving
- Testing of new or relicenced drivers in a safe environment prior to progressing to that actual road.
- Providing drivers with a realistic understanding of their limitations and those of a vehicle
- Practice of defensive driving techniques.

- **Simulation based training is also ideal for special vehicle handling and procedural training such as for Ambulance, Police and Emergency vehicles**

Car Simulator Elements:

Options are provided for full car, half car or desk versions where the simulator is created from actual car parts that has been modified and wired to work as a simulator. The driver quickly forgets this is a simulator, leading to realistic reactions during training. Computer controlled electro-mechanical sensors and actuators allow the instruments and controls such as steering wheel, brakes and gear stick to be fully functional and provide tactile (force) feedback to the driver as would be felt on a real car.

Out the Window Visuals

The driver is presented with realistic computer generated images (CGI) of the road and surrounding scenery as seen through the car windows and via the rear vision and external mirrors. A combination of projectors and LCD screens are used and the visuals allow for the simulation of weather conditions such as fog, rain and varying lighting conditions associated with cloud cover and time of day. Options range from a single Plasma or projected image, multiple screens or multi-channel projectors and 150 degree curved screen.

Sound

A spatial audio system with doppler effects provide the audio environment with realistic audio levels and directivity to replicate in cab sounds such as; engine noise, road and wind/rain noise, indicators, horn and other vehicles

Motion Base

By mounting the car on a six degree of freedom motion base, low frequency driving cues that include pitch and roll, general road vibration as well as

acceleration forces due to braking and cornering can be provided to the driver. A safety system is included providing interlocks, emergency stop buttons and start up warning.

Instructor Facilities

The instructor console allows the instructor to prepare a training session and to interact during a session.

The instructor can monitor the progress of the car along its route, the state of the car controls and instrument readings, the location and state of traffic signals, other vehicles, road hazards and conditions.

Functions that the instructor station provides includes the ability to:

- **Modify road route segments, including changing the road surface, road shoulders, road width and traffic signs**
- **Define and modify weather conditions including fog, hail and rain**
- **Introduce other vehicles along the route and modify their movement in real time**
- **Introduce faults in the car**

- **Intercom and CCTV contact with the driver**
- **Replay facility where the whole session can be reviewed from the instructor station**

Assessment and reporting

In setting up a training scenario the instructor has facilities to determine scoring on a range of parameters such as speeding, excessive acceleration and braking, fuel usage, adherence to lanes and signals/signage etc. All sessions are recorded on the student database and can be exported for further analysis. A range of student reporting can be customised to suit requirements.

Driver training

Scenarios are developed that enable drivers to learn the limitations of the vehicle as well as to experiment and tune their behaviours in dangerous situations. This training will develop the skills to ensure that the driver reacts in the most appropriate way when under pressure.

Vehicle Handling Competencies:

- **Use of Clutch, Brake and Accelerator**
- **Use of Gear Box and Gear Selection**
- **Loss of adhesion**
- **Tyre Blow-out**
- **Avoiding accidents and other vehicles or pedestrians**
- **Handling effects of different road surfaces (Bitumen, Gravel, Dirt, Ice**

External environment

- **Visual and handling effects of rain, snow and water across the road**
- **Visual effects of fog and sun glare**

Sydac develops its simulator for each application so they can be customised to meet specific training requirements and budgets.