driver training SOLUTIONS

# PRODUCT GUIDE

## PatrolSim™ 8 Law Enforcement Driving Simulator

Product Features, Technical Specs & Configuration Options

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# 1 | PRODUCT OVERVIEW

The PatrolSim™ law enforcement driving simulator from Driver Training Solutions (DTS), a division of Acron Aviation, is a cost-effective, hands-on, experiential training tool for law enforcement, offering experience without risks to officers or vehicles. The state-of-the-art PatrolSim™ allows you to expose your staff to various challenging and hazard-laden scenarios in a safe, cost-effective, and controlled environment. You can record operator reactions and response times, and provide after-action reviews that point out performance improvement areas for each driver. This training approach will improve your driver's critical driving skills, enhance decision making abilities, and increase the safety of your staff and the community you serve.

## PatrolSim™ Law Enforcement Driving Simulator provides:

- A state-of-the-art training experience that promotes a higher transfer of learning and increased retention.
- An opportunity to standardize your curriculum to ensure consistent, quality training.
- An adjustable, progressively challenging skill development path to enhance skills, improve defensive driving techniques, and hone decision making skills.
- An extensive library of customizable scenarios designed to address learning objectives relevant to your training objectives.
- The ability to introduce drivers to challenging situations that target skill development and increase the trainee's situational awareness, self-awareness, and critical thinking skills.


- Continual reinforcement of curriculum and key training areas by providing the ability for your students to practice and rehearse responses to dangerous situations in a safe, controlled environment.
- An after-action review (AAR) feature that allows for feedback and reinforcement, which increases the speed and effectiveness of behavior change.

Your PatrolSim™ will be delivered ready to train, right out of the box, including a high-resolution visual display system, reconfigurable instrument panel (glass dash), real-world vehicle cab design, and an Instructor Operator Station (IOS). Additionally, we offer many options to increase training capabilities and value by offering custom tailored simulator development and/or training curriculum to meet your organizational needs.

# 2 | STANDARD FEATURES

The modular, configurable, and ergonomic design of the PatrolSim™ simulator provides a replica of an actual Law Enforcement vehicle driving compartment. PatrolSim™ accurately simulates both the vehicle's physical and functional characteristics. It also automatically adjusts its behavior to the size, weight, turning radius, eye-point, and tire and suspension characteristics for each vehicle that it simulates. Standard features include:

- **Enclosure and frame** - Constructed of durable ruggedized steel components for durability, and thick aluminum for reduced weight.
- **Displays –** Three 55" Ultra High Resolution LED LCD wide-aspect ratio monitors with 4K UHD resolution, provide sharp, bright, high-contrast images with a forward-looking 180° field of view. Optional over-the-shoulder accessory screens add expand the field of view to 240°.
- **Virtual Environments –** A number of realistic and versatile virtual environments are provided to support the effective recreation of real-world conditions. These include urban, suburban, rural, and freeway environments.
- **Turnkey Training Scenarios –** An updated set of customizable scenarios that are pedagogically rigorous and vetted are included to provide out-of-the-box training capabilities. A variety of training objectives are included such as scanning, collision avoidance, space and speed management, emergency maneuvering, shifting, backing, and reaction times.
- **Scenario Builder –** Keep your training current and personalized with a custom scenario creation tool that allows you to modify and expand your scenarios and curriculum with ease.
- **Instructor Operator Station (IOS) –** Gives an instructor real-time visual feedback of both the simulator and driver's performance, manage scenarios and environment with vehicle malfunctions and weather, override system configurations, build lessons plans, access after action review tools and manage the driver assessment scoring reports.
- **Glass Dash –** An LCD virtual dashboard that provides accurate gauges, control indicators, and warning lights. The glass dash automatically changes to mimic the dashboard of the specific owncab vehicle selected, maintaining the capability to provide a broad range of training across multiple disciplines.
- **Lights/Siren Control -** Emergency lights and siren controls are provided via a physical siren control panel located to the driver's right. This panel includes lighted status indicators as well as various functions such as wail, yelp, hi-lo.
- **Real Vehicle Components–** Drivers are able to focus on training objectives while using real world vehicle components including an adjustable commercial vehicle seat with a 3 point seat belt, accelerator and brake pedals, and steering column with tilt, turn signal lever, hazard flashers, shift lever, and horn.
- **Mirrors –** Adjustable virtual left, right, and center rear view mirrors are embedded in the display and adjust automatically to correspond with the vehicle type and model being simulated (owncab). Convex and flat mirrors are simulated in real time to reflect realistic visibility.
- **Touch screen –** Password protectable touch panel allows the instructor and/or student full control from the driving compartment including the ability to load scenarios, modify simulator settings, and adjust vehicle features such as mirror settings.

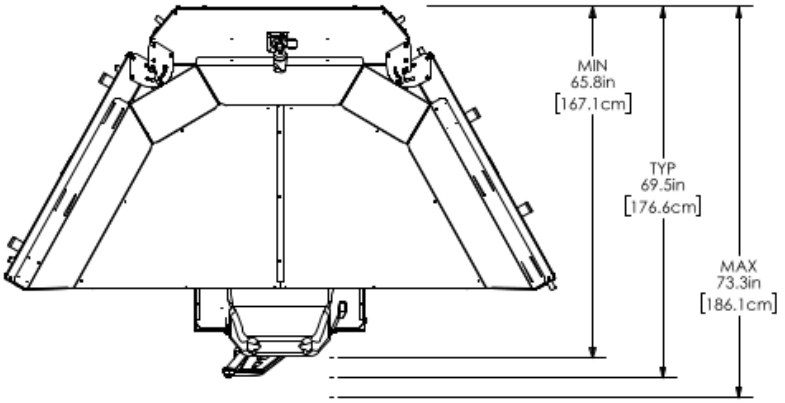
# Product Specifications

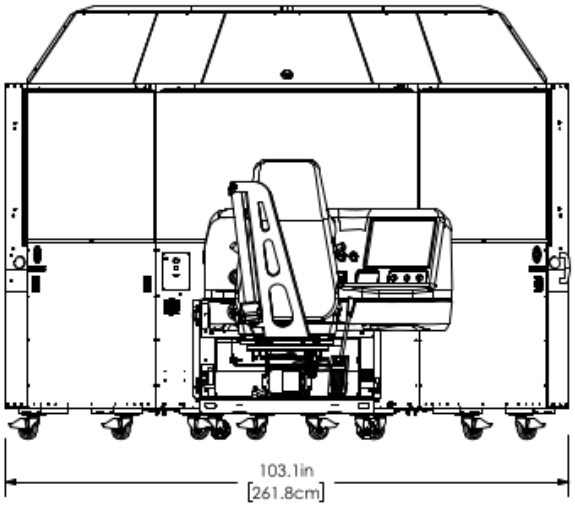
| Simulated Units | |
|---|---|
| **North America** | |
| Input Volts AC | 115/120 VAC~ |
| Line frequency | 60Hz |
| Amperage | 14.5 /15.5 A |
| **International (Configurable As Needed)** | |
| Input Volts AC | 220/240 VAC~ |
| Line frequency | 50Hz |
| Amperage | 7.5 / 10 A |

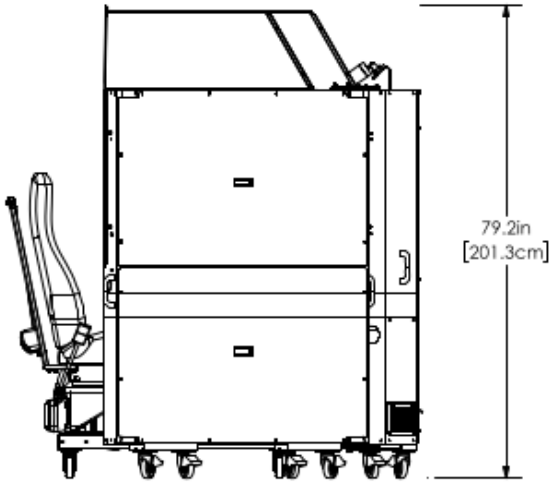
| Room | |
|---|---|
| Temperature | 50-85° F (10-30° C) |
| Recommended operating temperature | 65-72° F (18-22° C) |
| Relative humidity | 40-65% |
| Cooling | 12,000 Btu/h |

| Dimensions | |
|---|---|
| Simulator size | 103.1" (261.8 cm) W x 69.5" (176.6 cm) D x 79.2" (201.3 cm) H |
| Simulator weight | 817 lbs (371 kg) |
| Disassembled clearance | 36 in (82cm) width door |
| Recommended clearance | Fully-assembled unit will pass through a 72-in (1.8 m) width double door (without center posts) |

| Network Communications | |
|---|---|
| Internet | One high-speed connection is required |



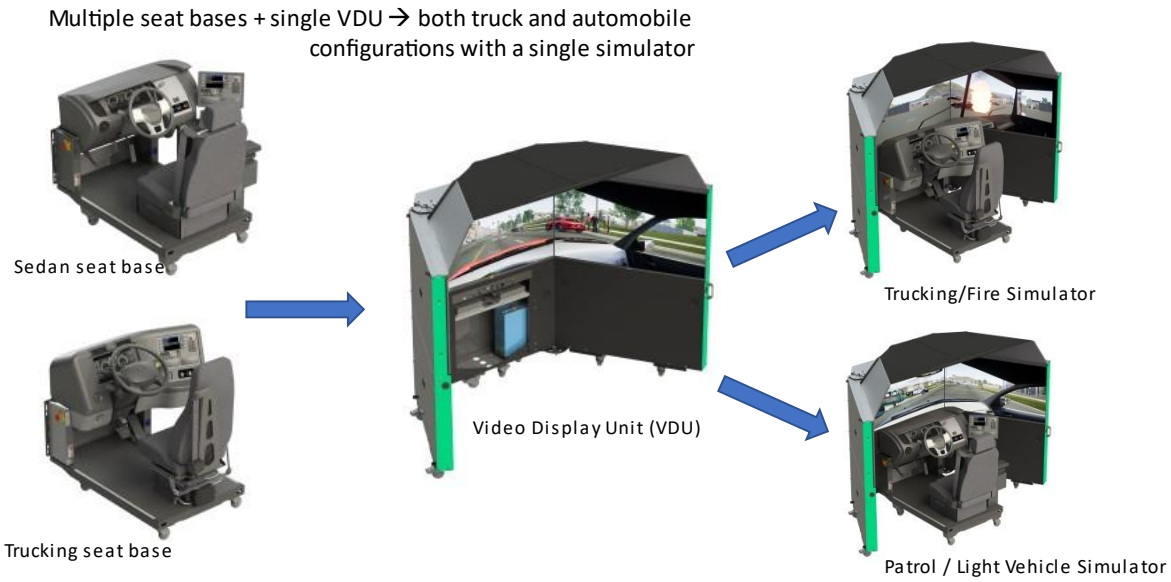



# Driver Compartment

The modular, ergonomic design of the PatrolSim™ driver compartment has become the standard to which all other driving simulators are compared. The driver compartment is designed to provide safety, comfort, and maximize training effectiveness. PatrolSim™ accurately simulates the physical and functional characteristics found in existing vehicle cabs. The driver simulator compartment and dashboard replicate the ergonomics of a real-world vehicle with the instruments and equipment located in the same relative position as they are in typical vehicles. Mirrors are placed in the correct locations and are adjustable, and the LCD dashboard and touch panel displays provide accurate renderings of gauges and controls. This ensures a realistic driving experience during training.

## OmniSim™ Modular Design

Our simulator platform supports reconfiguration using slide-in driver compartment cabs. This modular reconfiguration capability allows the customer to purchase a simulator with one type of seat base (seat, steering wheel, pedals and dash) such as a Law Enforcement vehicle, and add a different vehicle's seat base such as a commercial trucking vehicle. In just a couple of minutes, you can unplug one seat base, and swap in another, using the same displays. This provides the capability of several types of simulators, with minimal investment.



## Glass Dash

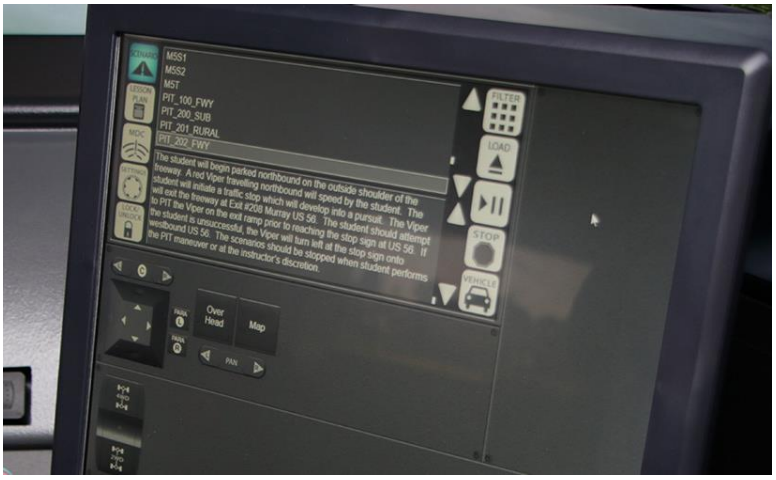
Switching from one vehicle dashboard configuration to another does not require any of the extra tools, storage capacity, loose bolts, or headaches common with a conventional hardwired dashboards. To change the dashboard configuration, the instructor simply selects the vehicle to drive. The photo-realistic, fully-functional, and accurately positioned dash instrumentation is automatically displayed on panels integrated into the dashboard. The computer-generated instrumentation is fully functional, looks, and operates like the real thing.

- Instrumentation size and shape is based on actual truck measurements and specifications.
- Glass Dash (LCD panel) provides the full instrumentation, including speedometer, fuel, temperature, and oil gauges.
- The appropriate dash is automatically loaded to match the vehicle selected for training.
- The standard vehicle library comes complete with multiple vehicle types and dash configurations.

Crown Victoria, Impala, and Interceptor Instrument Clusters Rendered on the PatrolSim Glass Dash

## Touchscreen

A touch screen panel, conveniently located to the driver's right, serves as the interface between driver and simulator. The touch screen allows the instructor or the driver to easily control the basic functions of the simulator such as starting scenarios, adjusting mirrors, enabling headlights, or adjusting simulator volume.




## MDC

The touchscreen also serves as the Mobile Data Computer (MDC) equipped in law enforcement vehicles. The MDC icon opens the MDC window for viewing messages sent from the IOS or that have been programmed into scenarios. The MDC window will automatically open when:


- Instructor can act as a dispatcher and send an MDC message from the IOS
- An event has been programmed in a scenario to send an MDC message
- The driver can press any of the buttons to the right of the MDC message to acknowledge receipt of the message.

## Multichannel Radio System with Microphone

The PatrolSim™ comes standard with an adjustable, console panel for the multichannel radio controls complete with magnetic mic and channel selector. The multichannel system can be controlled using the voice over network (VON) capability that syncs with the IOS so that an instructor can act as a dispatcher and communicate through the microphone system.

## Siren Control

During training, emergency lights and siren controls are provided via a siren control panel. This panel includes lighted status indicators as well as various functions such as wail, yelp, and hi-lo. Siren cadence changes are also supported through tapping the horn.


- 3-position Lighting controls
- TKD – activates Take Down lights that shine to the front of the vehicle.
- LA – Left Alley Light that will shine in the left screen
- RA – Right Alley Light that will shine in the right screen.
- A, B, C – auxiliary buttons that can be programmed for special functions.
- Manual – manual operation of the siren.
- Toggle Switch – move between control of Manual or Air Horn.
- Air Horn – sounds an air horn.
- Rotary knob will change the cadence of the siren (Wail, Yelp, Hi-Lo).
- Pressing the steering wheel horn will also cycle through and change the cadence of the siren.

## Visual System

The PatrolSim™ visual system software and visual textures are designed to provide the best possible driving simulation graphics available. We utilize the industry leading Unreal Engine 5 graphics system, providing unparalled visuals. This is required to ensure sharp and clear visual images that improve driver comfort by reducing eyestrain and providing a truly immersive and realistic driving experience. This includes the ability to identify street signs and coordinates, recognize changing road conditions, and scan for potential hazards, all at realistic viewing distances.

Environment Example with High-resolution Graphics.

## Displays

The display system comes standard with three 55" 4K LED LCD wide-aspect ratio (16x9) monitors. Each monitor receives our SimView graphics generated at 1920x1080 per channel and up samples to a 4K resolution to provide ultra-sharp, dynamic color range, optimal brightness and contrast, and distortion free images. The commercial, off-the-shelf displays provide fast refresh rates of 120hz, greatly reducing the motion blur and stuttering associated with slower displays. Systems installed with the over-the-shoulder view option have two additional 27" displays with 1920x1080 resoltuion displaying the activity of the driver's blind spots in real time. The native resolution of the display eliminates artifacts such as image stretch or shrink. The monitors are at a consistent radius from the driver's eye-point, thereby mitigating eye fatigue issues associated with systems where the focal distance is variable. Exterior left and right mirrors and a center interior mirror, where appropriate, are simulated with images that update in real time providing the proper and realistic visibility conditions and behaviors.

The field of view (FOV) provided allows for a 180° radius from nominal seat position. The aspect ratio and diagonal size of the three displays provides an ample field of view (FOV) while minimizing artificial blind spots. Optional over-the-shoulder accessory screens add as much as 60° of field of view in each direction for a physical total of 300°, and a virtual of view of 360° with mirrors and pan functions engaged. This FOV allows the driver to safely train to clear an intersection for example, and the vertical FOV is as large as or larger than a typical windshield and window area.

| Feature | Description |
|---|---|
| **Number of Channels** | 3 |
| **Aspect Ratio** | 16 x 9 |
| **Eye Distance to Screen** | 38-46 inches (adjustable with seat position) |
| **Horizontal Field of View** | 180° at 42-inch eye point, plus 60° each direction with over-the-shoulder option |
| **Vertical Field of View** | 33° |
| **Scene Edge Matching** | 3 side-by-side monitors (2 seams) |
| **Seam Width** | Approximately ½ an inch |
| **Rear View Mirrors** | Adjustable driver's side, center, and right side insets. Side insets can include both standard and convex mirrors. Center insets may be interior or exterior rear views, depending on the vehicle. |

## Image Generators (IG)

Standard, off-the-shelf PC with optimal fast-core graphics processors allow us to generates the real-time imagery that makes the simulator such an effective training tool, while reducing costs and maintenance drastically. The following table summarizes the features of the image generator provided standard with the PatrolSim.

| Feature | Description |
|---|---|
| Image Generation | Intel i7-12700F processing and GeForce RTX 4070 video processing |
| Update (Refresh) Rate | Rendered at 60 fps and displayed at 120 fps |
| Resolution | 1920 x 1080, displayed in 4K 4096x2160 pixel resolution |
| Texture | Photo-realistic, best-in-class Unreal Engine 5.2 graphics engine |
| Time of Day | Fully adjustable, including sky models for dusk, and realistic nighttime sky |
| Illumination | Headlights, taillights, directional light, EVO lights, emergency vehicle lights left and right alley lights, overhead takedown lights (based on vehicle type) |
| Weather Effects | Multiple levels of fog, rain, snow, ice, and sun glare |
| Transparency | Yes |
| Color | 32 bit |

Our team designs and develops the visual system in-house allowing us to respond quickly to our Clients' needs and to optimize our solutions specifically for effective driving simulation and training. This approach also allows us to be able to customize our solutions for virtually any requirement. Our use of standard, off-the-shelf components and our modular design allows us to keep current with technological advances and improve the level of performance we can provide, while keeping costs low.

## Optional Over-the-shoulder and Rear Views

The simulator can be provisioned with with optional 27" monitors, positioned just beyond the forward-vision of the driver, adding an additional 60 degrees of view in each direction for a total of 300 degrees FOV.

Similarly, PatrolSim can be optionally provisioned with a full-size monitor, positioned directlt behind the driver to allow instruction and practice of reverse-driving skills. When over-the-shoulder, and rear views are included, the PatrolSim provide a full 306 degree FOV.

# Audio System

A 5.1 (six channel) surround-sound system—including a sub-audio tactile transducer to generate vehicle vibrations—is integrated into the simulator to accurately produce sounds and audio cues to the driver. Sounds are computer generated from recordings of actual in-cab sounds. These audio signals are played back to the driver in real time at the actual sound levels experienced in the real vehicle.

Internal vehicle audio source emulation includes:

- Engine audio source synthesis
- Tires and chassis digital audio replay
- Tire squeal dependent on road surface
- Radio chatter

External audio source emulation includes:

- Wind in relation to speed and vehicle aerodynamics model
- Miscellaneous environmental sounds such as sirens and traffic
- 3d sound directionality such as passing automobiles and trucks

Vibration includes:

- Tactile sound transducer attached to the seat to partially simulate road vibrations
- Steering wheel feel providing natural tactile stimuli amplitude correlated with tire-and-roadway interaction and engine operation, and fully synchronous and complementary with audio signals

Audio software includes:

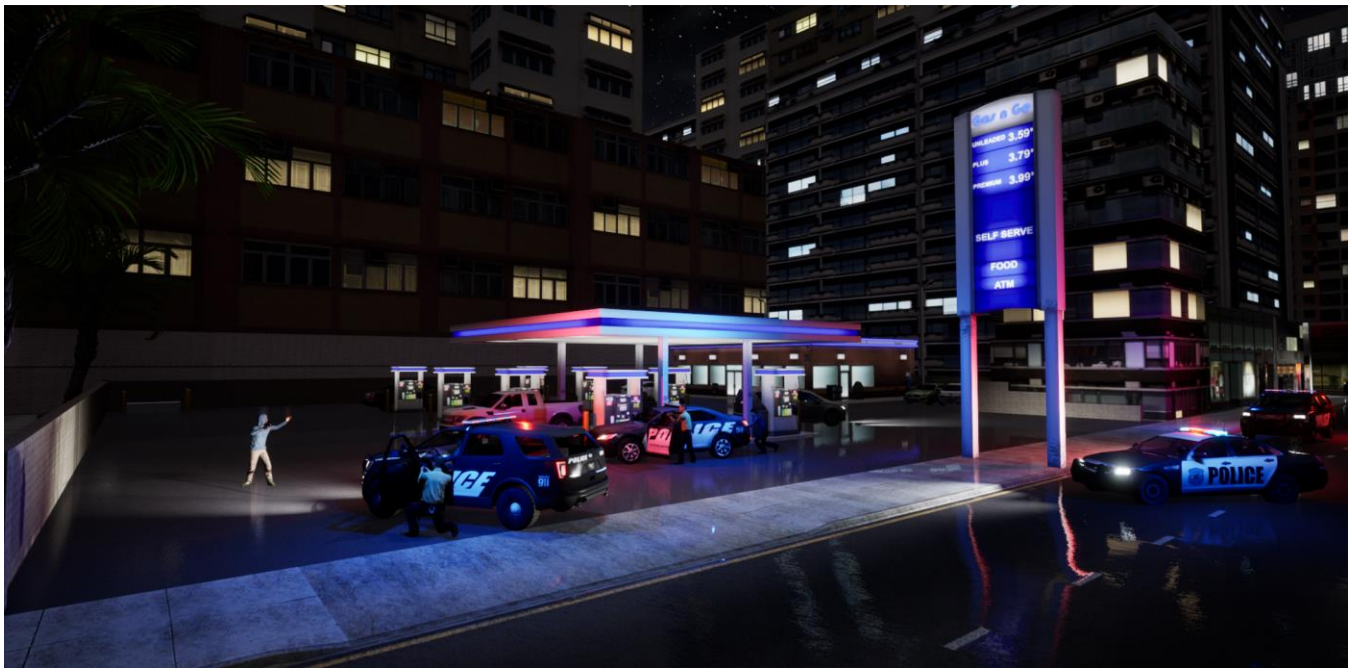
- Engine sound specific to each scenario vehicle
- Horn sound specific to 12 scenario vehicle classes
- Other sounds associated with the position of any scenario vehicle
- Owncab engine sound specific to the vehicle model
- Static sounds with fixed spatial position
- Dynamic sounds that can be associated with any scenario object
- Software design improvements for greater reliability and maintainability

# 2.1 Content Scenarios & Vehicles

## Law Enforcement Scenarios

Provided with every PatrolSim™ is a comprehensive library of pre-built training scenarios to provide your agency with a turnkey training program with minimal effort. These scenarios can be modified, expanded, or new ones created using the Scenario Builder tool included with your simulator.

New encapsulated scenario packages walk students through prescribed skills starting from a beginning training level, encouraging practice at an intermediate level, and providing challenges and assessment at a professional level.




- **Law Enforcement Scenarios:** A library of more than 100 scenarios developed to introduce and train drivers on common law enforcement situations. These include non-emergency response, patrol familiarization fundamentals, vehicle dynamics, intersection clearing, traffic violations/stops, vehicle pursuits, emergency response, and collision avoidance.
- **EMS Scenarios:** A set of scenarios specific to EMS response situations designed for first responder personnel that respond to medical emergencies, fires, collisions, and other situations in a variety of environments and conditions.
- **PIT Maneuvers:** A set of scenarios for practicing in different driving environments for the PIT (pursuit interdiction technique) maneuver.
- **Novice Driving Scenarios:** A set of scenarios for use with light vehicle sedans (included) that provide familiarization and introductory topics on scanning, road hazards, critical thinking, and negotiating traffic in

different conditions. This set of scenarios is ideal for teaching new drivers, teens, senior citizens, and rehabilitation patients. This set of scenarios is a great resource to use at community events where the simulator can also be utilized as a public awareness tool for critical traffic safety issues including distracted driving, fatigue, impairment, and speeding.

- **DUI Scenarios:** A set of scenarios developed to introduce drivers to the impact and results of driving under the influence. Various “intoxication levels” can be introduced to simulate the effects and impairments of alcohol.
- **Enhanced training tools:** Introductory videos, slide and billboard material and interactive quizzes are presented to the student inside the simulator.

## Law Enforcement Vehicles

PatrolSim includes a library of common patrol and light vehicles for use in training. These drivable vehicles include the appropriate dashboard configurations and driving characteristics, and most can also be placed with the scene as scenario vehicles. For more details on specifc vehicles and configurations contact us.

- Police Ford Interceptor, Black & white, AWD
- Police Ford Interceptor SUV, Black & white
- Police Chevy Caprice, RWD
- Ford Explorer, Black & white
- Police Impala
- Police Dodge Charger, Black & white
- Police Chevy Tahoe
- Ford Crown Victorian for Police, Sherriff, and Highway Patrol versions
- SWAT Command Vehicle
- SWAT Support Vehicle
- SWAT Step Van
- Chevy Suburban, Armored
- Ambulance
- Ford Ranger
- GMC Sierra 2500
- Toyota Camry




- Black Sports Sedan
- Chevy Astro
- Chevy Delivery Van
- White Ford Taurus
- White Step Van

## EMS & Fire Vehicles

PatrolSim also includes a library of common Emergency Response vehicles for use in training. These drivable vehicles include the appropriate dashboard configurations and driving characteristics, and most can also be placed with the scene as scenario vehicles. For more details on specific vehicles and configurations please contact us.

- Ambulance
- Pierce Enforcer Pumper Truck in Yellow, Red, and Red with Black Top
- Paramedic Ford Expedition





## 2.2 Vehicle Dynamics

The vehicle dynamics used in the PatrolSim™ are based on sophisticated automotive engineering concepts and are driven by both measured physical characteristics and manufacturer specifications. The resulting vehicle behavior model has been validated against published proving ground results and vetted with industry experts. Our vehicle dynamics models are comprehensive enough to represent real vehicle behavior. Each tire, wheel, suspension point, steering wheel, engine, transmission, drive train, and chassis is modeled.

The advanced physics model includes 21 data-point model representing tires, suspension, vehicle chassis, steering and power train. This level of sophistication matches that in engineering applications and enables our unfiltered use of vehicle manufacturer and other OEM data.

### Vehicle Dynamics Modes Simulated

PatrolSim™ operates across a wide range of performance modes consisting of several vehicles and environmental factors.

- **Normal Operation:** The default vehicle dynamics setting is normal operation.
- **Vehicle Motion:** Vehicle suspension and motion are accurately simulated. Visual cues are provided to the student by the displayed vehicle moving and responding in concert with the vehicle's acceleration and braking factors.
- **Speed:** Acceleration and speed are accurately simulated based on the vehicle models incorporating vehicle engine specifications.
- **Environment Surface/Conditions**: Environment surface conditions change appropriately with rain, snow, and ice.
- **Transmission Selection:** Transmissions are modeled in each vehicle's dynamics model incorporating vehicle engine specifications.

PatrolSim™ provides vehicle dynamics models that are modular and adjustable representations of actual vehicles' subsystems. The tire patch model provides interaction with the road surface to simulate actual skids, tire envelopment over objects, and road hazards. The accurate tire-and-road model interacts with dynamic forces on the simulated vehicle to allow a full spectrum of tire reactions, so the driver feels a variety of forces and sensations as the wheels interact with surface variations and objects.

## Vehicle Subsystems

Simulated vehicle subsystems are an integral part of the vehicle model. The modeled subsystems include:

- power train
- electric, hybrid and hydrogen drive trains supported
- braking system
- suspension system
- tire system
- chassis system
- control inputs (throttle, brake, clutch, steering, gear selection)
- disturbance inputs (wind, terrain, collisions)
- instrument panel outputs (vehicle speed, engine speed, warning lights, etc.)
- on-screen displays of vehicle speed and compass

All subsystems use sound automotive engineering principles and simulate real vehicle counterparts.

## Anti-Lock Braking Systems (ABS)

We've designed nearly all of our vehicle models to operate in the simulated environment in a manner consistent with the use of an ABS system. Our ABS function simulates braking forces in keeping with real vehicle behavior. Braking efficiency is also realistic and in accordance with road conditions. The ABS function can be configured, before or during the simulation, from the Instructor Operator Station. The instructor may select rear-wheel ABS, all-wheel ABS (for vehicles so equipped), no ABS, or choose to return the vehicle to its default setting.

## Collision Detection

PatrolSim™ detects all collisions between the student vehicle and objects in the scene. Collisions are detected and responded to immediately upon contact. Relevant information about the collision is reported to the host computer. Collisions of varying speed or size are treated with appropriately varying severity, with corresponding differences in the visual and dynamic feedback. The instructor has control over whether or not collisions halt the scenario or damage the student vehicle.

## Road Modeling

Roads are high-resolution, 3D surface models with curbs, gutters, soft edges, variations in surface texture and content, and assorted hazards. Some have super elevation for banking around curves. Some road surfaces are designed to the U.S. Standards for Highways or The American Association of State Highway Traffic Office.

Available road surfaces include:

- Asphalt
- Cement
- Gravel
- Sand
- Dirt
- Mud
- Ice
- Snow
- Pot Holes

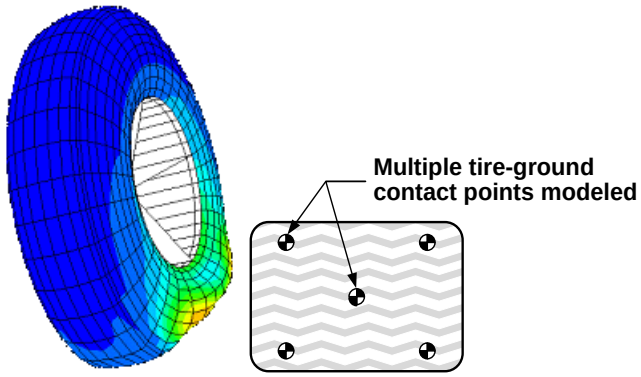
In addition to 3D road-surface models, we sample the critical interface between tire and road at a rate of around 960 Hz. This is essential to capture accurate vehicle position, road feel, and vehicle control. At this rate, the distance we measure between tire-and-road samples is 1.7 cm at 60 km/h. For comparison, if a simulator sampled its tire-and-road interface at 60 Hz, the distance between tire-and-road samples would be 27.7 cm. Sampling at lower frequency does not provide high-fidelity modeling of vehicle control.

Our proprietary 3D road surface model, which is far superior to our competitors' polygon-based road surfaces, interacts with the vehicle's dynamics and tire models. As no road in the real world is completely flat, our unique technology can accurately simulate uneven and crowned road surfaces for a more realistic training experience.

## Tire Modeling

Accurate capture of vehicle behavior is dependent on a high-fidelity tire model. Our model captures the tire behavior from stopped to high speeds and from nominal driving to complete loss of traction on all kinds of road surfaces. The model captures all of the standard Society of Automotive Engineers performance measures for ride and handling simulations, including:

- normal forces and vertical displacement
- lateral slip, slip angle, and normal force
- longitudinal force, rolling slip, and normal force
- composite vector limits on total reaction force and normal force




Most simulation models use only a single point to represent the patch of the tire that contacts the road. Our superior tire model uses up to five sample points to fully capture the interaction of tires with the road. Automobile and tire manufacturers supplied the high fidelity data on tire forces for our model, which lets drivers feel the effects of tire impacts through our direct-drive SimuCube steering system.

## 2.3 Virtual Environments

A number of realistic and versatile virtual environments are provided to support the effective recreation of real-world conditions. The virtual environments that come standard with PatrolSim™ include rural, freeway, city, suburban, business, industrial, and residential areas, all including objects and features representative of those areas. The road networks have paved and unpaved roads that range from simple trails to four-lane freeways. Divided freeways include mountain areas, runaway ramps, on-off ramps, and rest areas.

Roads and highways in the virtual world are designed in accordance with standard highway specifications for grade, width, curvature, and overpass height. Traffic control signals and highway markings are consistent with standard street and highway markings. Road types are appropriate to each environment, and are consistent with real-world conditions.

Roads include expressways, multi-lane highways (interstate), high-speed entrance/exit ramps, cloverleaf and trumpet intersections, over/under passes, elevated/below grade highways, foot bridges over the roadway, ascending/ descending gradients with switchbacks, mixed surface types (concrete/gravel/asphalt), speed-bumps and dips. Major country road surfaces are uniform and smooth with little or no shoulder. Some country roads are made up of either gravel or dirt surfaces with accompanying changes in traction.


### Suburban / Downtown Zone

Typical suburban downtown cultural features are provided in this environment, including: office buildings, hospitals, stores, banks, restaurants, fire stations, loading docks, bridges, multi-lane roads, street junctions, functional stoplights, road signs, traffic control signs, typical vegetation, multi-lane streets, construction zones, dead-end roads, and narrow streets.

## Suburban / Residential Zone

Typical features provided are hospitals, single-family homes, schools, apartment complexes, fire stations (drive through capable), strip-malls, restaurants (fast food w/drive through), banks, functional stoplights, road signs, traffic control signs, typical vegetation, driveways and sidewalks. Multiple roadways (two lane, four lane), intersection types, buildings etc., provide an excellent place to practice a wide array of driving maneuvers.

- walk / don't walk indicators with 'stale green'
- parking meters
- speed signs
- school with school zones
- open areas
- canyon area
- fire station
- narrow single-lane bridge
- warehouse for backing

The Suburban/Residential/Downtown area also includes these features:


## Rural/Country

This environment incorporates numerous hills and winding two-lane roads. Limited visibility and sudden curves enhance training in speed and vehicle control. There are straight sections with limited foliage as well as winding sections that contain blind curves. Features include: branching Y-type roads, single-track bridges, rail-road tracks/crossings, open multi-lane interstate highways, blind intersections, and small, roadside villages.

## Urban City Area

A moderately-urban area containing dead-end alleyways, graffiti covered buildings, parking garages, sharp turns, a bridge, tunnel, and high rise buildings. This driving environment allows continuous driving across multiple types of city environments.

## Freeway

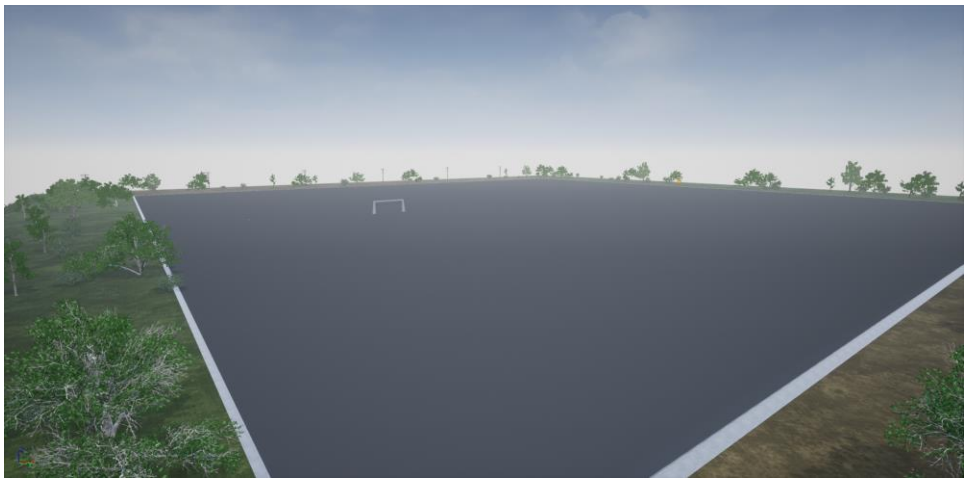
The freeway driving area includes more than 23 miles of two- and three-lane roads with overpasses, on-ramps, off-ramps, canyons, truck runaway lanes, six-percent grades, a rest area, and all of the appropriate signage.

## Mountain Pass

This driving environment has 14 miles of winding mountain roads and several miles of forest trails. There are steep drop-offs, bridges, switchback curves and tunnels. The mountain environment is useful for training on windy, narrow, snowy, and slippery roads. It is an environment representing Wolf Creek Pass in Colorado.


## Skid Pad

Skid Pad is a simple, flat asphalt environment, with a large puddle in the center of it. This environment includes markings and cones, and allows drivers to practice simple emergency maneuvers and avoidance.



## Skills Range

The Skills Range is a simple, flat environment.  It consists of a traffic light stand and flat surface area.  Scenarios can be built around the traffic light; in the flat, open surface area, or both.  The Skills Range is useful for testing a driver's response time and vehicle handling skills.  It can be set up as a cone slalom course or a quick decision-making area with traffic lights.  Police drivers use a skills range like this for quick reaction training.

## Driving Track

A driving environment useful for training and practicing common law enforcement skills and maneuvers. This track helps to train students in a safe environment on the physical limitations of their vehicle, such as how fast they can take turns without skidding or rolling, etc.

## Virtual Environment Features

The following features are available in the standard environments:

- Alleyways
- Hidden oncoming traffic
- Roads with gravel surfaces
- Animated smoke and fire
- Hilly roads
- One-way streets
- Appropriate signage
- Large parking lots
- Roads w/uneven (partially paved) surfaces
- Blind intersections
- People / Pedestrians in various activities
- Caution signs
- Multiple lane roads
- School zone
- Civic centers
- Narrow roads
- Small roadside villages
- Commercial properties
- Narrow, single lane bridges
- Speed limit signs

- Roundabouts
- Neighborhoods
- Steep grades and inclines
- Operational traffic lights
- Crosswalks
- Street signs
- Police station
- Farms
- Shopping areas
- Railroad tracks
- Gas stations
- Residential properties
- Road workers with active stop/slow signs
- Flashing arrow boards for construction zones
- Wide variety of fixed/moving objects
- Construction vehicles
- Speed-bumps and dips
- Construction zone
- Parks
- Cul-de-sacs
- Railroad crossings
- Stop signs
- Winding lanes
- Wooded area
- Roads with overhead pedestrian crosswalks
- Construction zone barriers, cones, etc.
- Branching "Y" roads with appropriate signage
- Warehouse with loading dock
- Large connected parking lots for backing.

# 2.4 In-simulator Instructional Tools

The simulator is equipped with advanced instructional presentation and evaluation tools that help instructors and curriculum designers guide students through their learning structure.

## Visible Ideal Path Guidance

During creation of custom scenarios (and included in some provided instruction), the scenario creator can designate and "ideal path" for the driver, meaning a specified route the student should take in order to best execute a particular skill. The ideal path can be set in Scenario Builder by inserting critical way points, or for more granualarity, can be captured by simply driving the scenario in the simulator.

Once defined, the instructor can decide to make the ideal path visible to the instructor only on the IOS, or to be visible inside the simulator for the student to follow. The ideal path is represented by a series of arrows in the roadway representing the path for the student to follow.

## In-scenario Video Presentation

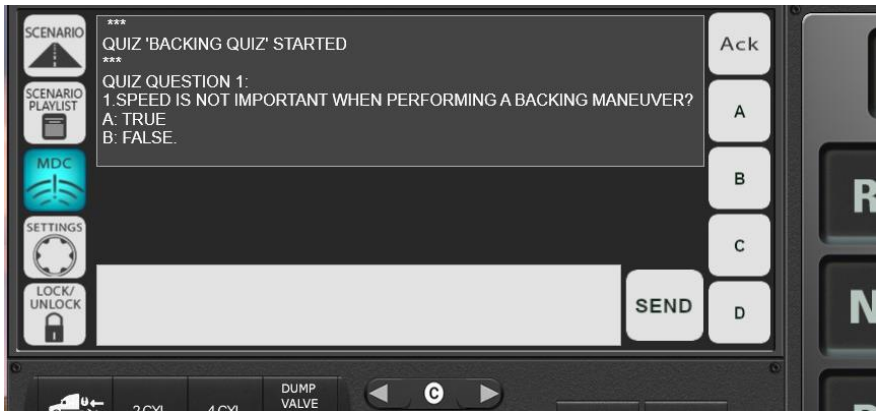
Capitalizing on the student's immersion in a rich media environment, the simulator can present complete and encapsulated video clips, with both video and audio, as part of a scenario. Curriculum designers may leverage this feature to present introductory explanations of the skill to be taught and practiced in the simulator, or may want to emphasize opstacles or summarize challenges after a practice with videos.

## In-scenario Billboard Presentation


Scenario designers can utilize road signs and billboard, not only to create a realistic driving environment, but also to relay instructions to the students. Billboards inside the simulation can display custom and instructional content.

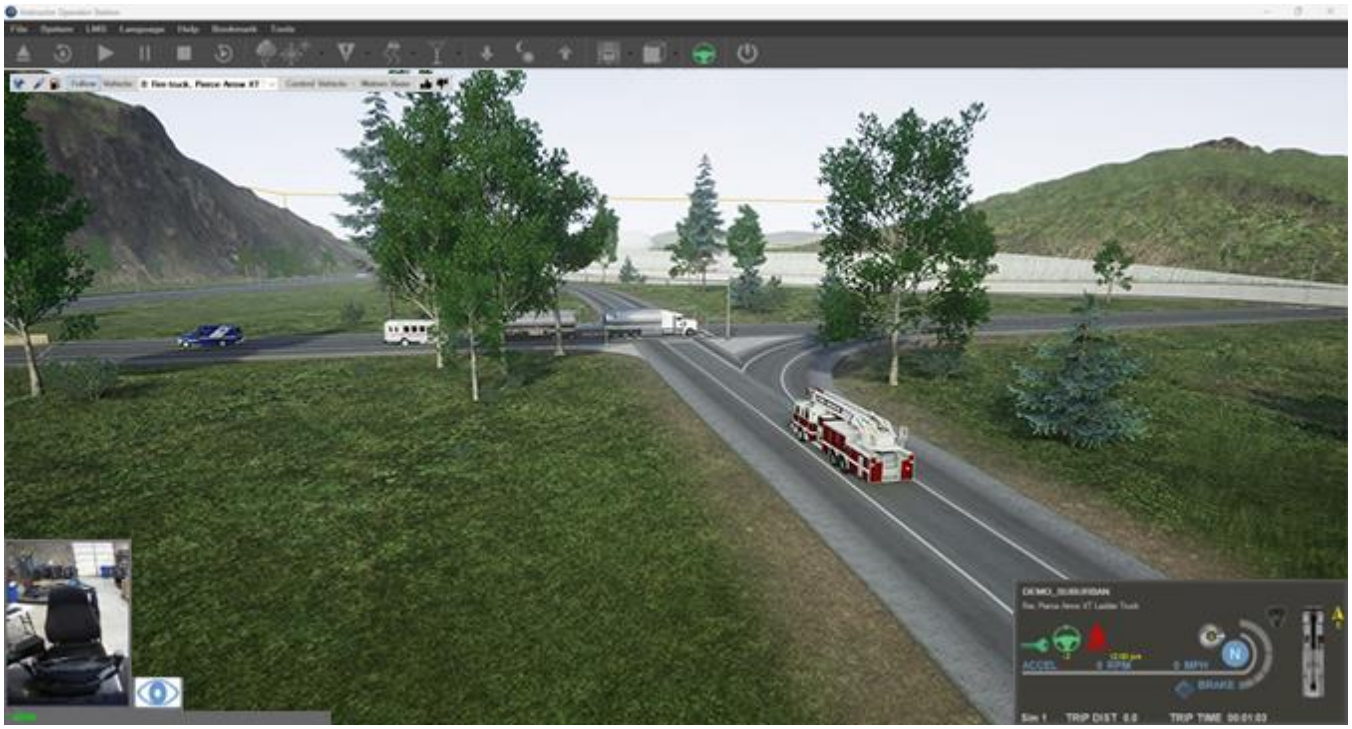
## Interactive Quiz Assessments

To emphasize the instruction received and practice in a scenario, designers can incorporate ineractive quizzes as part of the assessment, giving the student the opportunity to provide answers on the touch screen console interface while still inside the simulator.



## 2.5 Instructor Operator Station (IOS)

The purchase of a PatrolSim™ simulator includes a user friendly Instructor Operator Station (IOS). The instructor's computer skill level need only be sufficient to operate a word processor or similar type of program. A Windows™ format User Interface (UI) on the instructor's computer screen provides an easy, non-intimidating instructional flow to start the simulator, choose scenarios, change scenario conditions, change vehicles, and interact with the driver in real time during training.



The instructor station includes multiple display areas and icon control buttons. A single screen provides all the functions required for one instructor to control all the training and simulator control functions for up to four simulators. The operator uses an ordinary mouse and keyboard to select and activate functions. The operator can control and manipulate individual vehicles in the driving scenario while the scenario is running. From the instructor station, for example, a car can be made to drive aggressively or stop quickly in front of the driver when the instructor commands it to happen.

The IOS allows the operator to select the vehicle type and dynamics to be driven by the student, (owncab). For example, a Ford Interceptor for one student, while another drives a Dodge Charger. Each simulated vehicle's feel and performance will approximate that vehicle's size, weight, turning radius, tire and suspension characteristics, etc.

The trainee's drive can be recorded and played back. This is a great training tool that can help the driver see his proximity to other vehicles or objects during the replay. When a trainee hits an object, the scenario can continue or stop, depending on how the instructor sets up the scenario at the IOS.

## Primary Features

- An easy-to-use, graphical user interface
- Toolbars
- Real-time feedback and visual status on simulator, environment and driver
- System configuration settings
- Control lighting, environment settings, vehicle malfunctions

### Real-Time Feedback

While the student is driving in the simulator, the Replay Control software reports violations, warnings, and other events as they occur. A recording file can be saved, and replay can be started at a point just prior to any violation. A scroll bar allows the instructor to move quickly to any point in the recording. From the IOS, the instructor has complete control and visibility of the training experience.

#### Vehicles

The instructor can control scenario vehicles within a scenario from the IOS. The behaviors of the scenario vehicles that can be controlled include:

- Speed
- Forward/reverse direction
- Obedience to rules of road (stop, yield, etc.)
- Driver drunkenness
- Aggressiveness

## Scenario Control

From the IOS, the instructor can control traffic in the scenario in a number of ways. Traffic can be pre-set, so that vehicles will behave autonomously according to the parameters chosen by the scenario creator. In addition, the instructor can, during the scenario, trigger events and/or take control of any vehicle. Events can be triggered manually, or they can be set to be triggered by dependencies: after a certain amount of time has elapsed, once a certain speed has been reached, once the driver enters a certain zone, etc.

The following are examples of elements that the IOS brings under the control of the instructor:

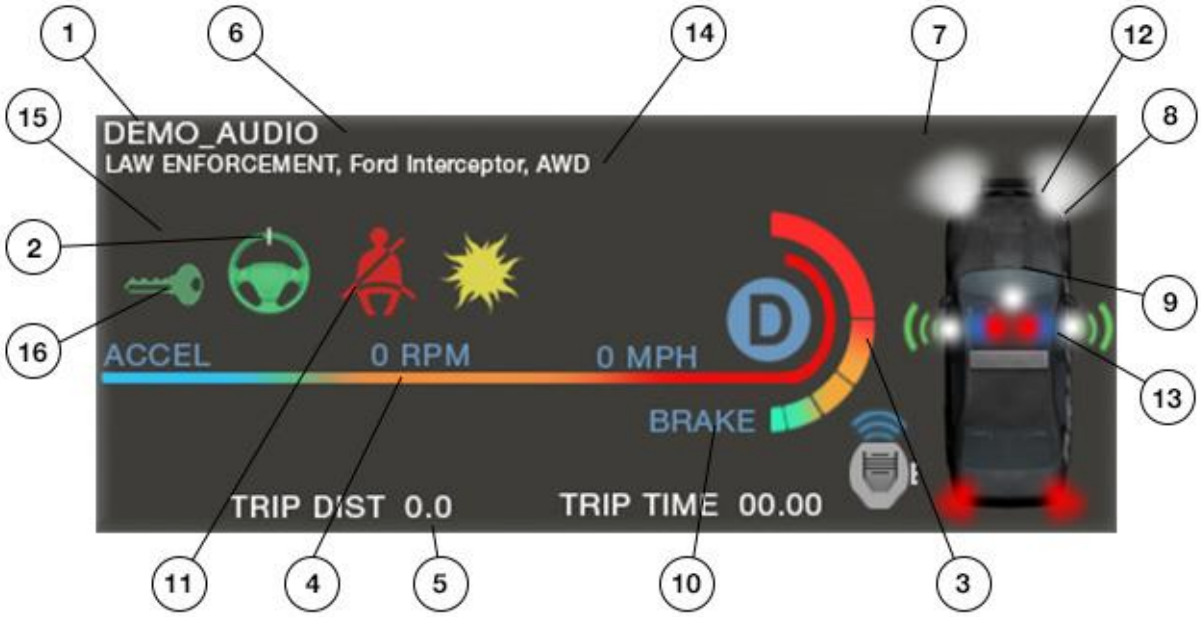
- The simulator can create day, dusk or dawn, and night conditions. Each setting enables a new sky model to provide the appropriate visual effect.
- The instructor can control weather effects and road conditions in real time or can script them into scenarios using the Scenario Builder scenario creation tool. The instructor can modify environmental conditions in real time. Environmental conditions include rain, snow, ice, fog, and wind. Each of them is configurable from very light to very heavy.
- The instructor can control the vehicles in a scenario (see above).
- The instructor can monitor the following functions for each simulator running (up to 4 from a single IOS) using the SimTile Panel.

## Multi-Sim Networking

PatrolSim™ is designed to function either as a stand-alone unit, or as part of a network of simulators controlled by a single IOS. Up to four simulators can interact with each other in the same scenario, if the scenario has been specially built for networked use; this offers opportunities for group training.

## SimTile Panel

The SimTile panel collects and provides information and indicators that let the instructor view the driver input and vehicle status for a given simulator in real time.




1. Scenario and vehicle names
2. Steering wheel position
3. Brake, accelerator, and clutch
4. Speedometer and tachometer
5. Time and trip distance
6. Host computer status
7. Transmission status
8. Turn signals
9. Owncab model
10. Parking brake
11. Seat belt
12. Headlights
13. Siren controls and lights
14. Scenario status
15. Horn
16. Ignition

## Vehicle Malfunctions

The following vehicle malfunctions can be triggered and cleared in real time during training by the instructor from the IOS, or scripted into a scenario to happen automatically. Driver performance in response to malfunctions and emergency conditions can be recorded, some automatically and others manually under instructor control. Not all malfunctions are available on all systems since failures are mapped to the vehicle type.

- **Blowout Tires**: blow out left tire, blow out right tire, restore left tire, restore right tire
- **Failing Brakes**: fail brakes, restore
- **Smoking Brakes**: left, right, restore
- **Engine Temp:** overheat, restore
- **Engine Failure**: fail, restore
- **Oil Pressure:** fail, restore
- **Failure of Headlights**: left, right, both, restore
- **Low Fuel:** low, restore
- **Engine Faulty**: faulty, restore
- **Locked Brakes**: front left, front right, rear left, rear right, trailer left, trailer right, restore
- **Wait to Start Lamp**: on, off
- **Maintenance Lamp**: on, off
- **General Warning lamp**: on, off
- **Stop Alert Lamp**: on, off
- **High Exhaust Temp Lamp**: on, off
- **DPF Status Lamp**: on, off
- **Malfunction Lamp**: on, off

## Weather Effects and Variable Road Conditions

The simulator provides a full range of weather controls of varying density. Weather effects/road conditions can be controlled in real-time by the Instructor or scripted into scenarios. Environmental conditions can be modified in real-time and include the following options:

- **Rain:** Selections are Very Light Rain, Light Rain, Medium Rain, and Heavy Rain.
- **Snow:** Selections are Very Light Snow, Light Snow, Medium Snow, and Heavy Snow.
- **Ice:** Selections are No Ice or Ice Levels 1 through 5.
- **Fog:** Selections are Very Light Fog, Light Fog, Medium Fog, and Heavy Fog.
- **Wind:** The operator uses the wind-active Enable/Disable buttons to enable or disable wind at any time. Wind in the simulation is comprised of three parts: Wind speed (MPH) and Heading (the direction in degrees), and Gusts (speed/frequency, number of gusts per second).
- **Sun Glare:** A sun glare effect appears on the center channel (screen) when facing east in the morning, and west in the evening.
- **Time of Day:** The simulator provides a full range of day, dusk, and night capabilities.

## Scenario Builder™

Custom scenario creation, expansion, and modification can be easily accomplished using the provided Scenario Builder™ authoring tool. The Scenario Builder™ software has a 3D interface that makes creating and editing scenarios simple and straightforward. The instructor or scenario developer can populate a scenario with a few simple clicks. Our team can also work with you to train your operators on advanced scenario creation, or custom scenarios for any training objective or curriculum need. For more information about the Scenario Builder™ software features please contact us.


Scenario Builder™ will enable instructor to:

- Build customized scenarios.
- Use preloaded or existing scenarios as a base for new scenarios without the need to rescript the entire scenario.
- Build scenarios for accident remediation, employment pre-screening for new drivers and targeted training for existing drivers.
- Easily and affordably create training content for classroom presentations.
- Add new challenges to accommodate any trainer experience level.
- Present variation-on-theme to promote complexity within a training progression.

- View scenarios from any angle, including top-down view for vehicle positioning.
- Control the sequence and timing of event triggering.
- Create scenarios on a separate PC and transfer the information to the simulator with a flash drive.
- Compatible with any standard desktop or notebook PC with 3D graphics capability.
- Add or adjust ideal-path indications to guide students through the scenarios
- Insert instructions videos, billboard and interactive quizzes.

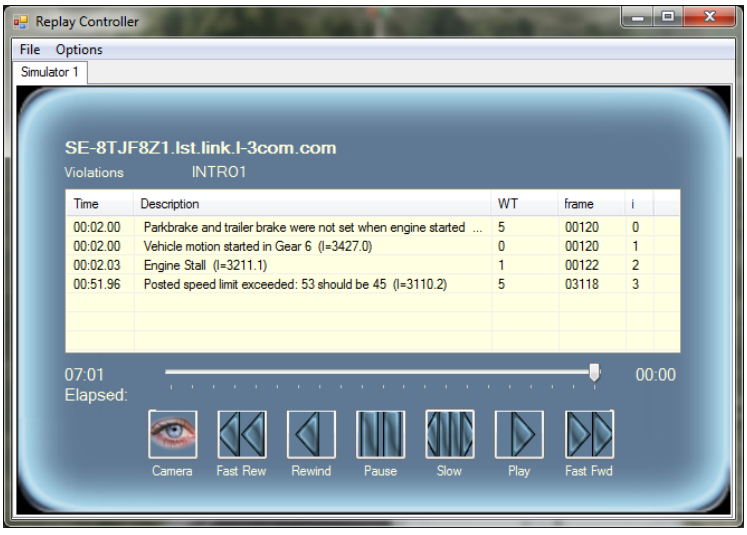
Scenario Builder will enable the instructor to determine vehicle characteristics such as vehicle type, rate of speed, directional bearing, and other attributes. The interface will be used to define the behaviors, decisions, and interactions that will occur between the scripted vehicles, pedestrians, and student-operated vehicle. The route each vehicle and dynamic pedestrian will travel is under the expressed control of the instructor. All aspects of the scenario can be determined by the instructor to ensure that the desired intend of the prescribed training will be met.

Scripted scenarios are an important component of a standardized training program in that each scenario is repeatable and will convey a consistent delivery of the prescribed lesson for each participant.

Scenarios can be modified so that changes can be made and saved to create variations that will keep the content fresh and challenging from one year to the next. Scenarios will remain stored at the instructor station. Libraries can be built quickly by modifying existing scenarios to create new lessons.

## Replay Studio™ After-Action Review

The instructor station can record training scenarios so that they can be replayed. Replay can be viewed from multiple eye points, including those of the driver, a third person, and multiple bird's-eye views.




The playback of any recording recreates all of the original training exercise cues, including audio, visual, vehicle states and video of the student/operator while driving. After playback of an exercise, the instructor can reload the same scenario, or load a new exercise. Student scoring records can be displayed and printed as part of the replay. The replay control window shows violations, provides a slider bar to quickly move to any point in the scenario, and allows the instructor to change viewing (camera) angle, while providing complete control over the replay.

The instructor can activate the replay mode at any time during the scenario. The instructor can pause or freeze the scenario during the training session and resume training from the point where the scenario was frozen. When the scenario is frozen, the instructor can play it back using the replay mode, exit the scenario, and provide student performance analysis. The instructor can also click on a scoring violation or event to go directly to that point in the replay or use the slider control to quickly move through the replay.

## Replay Tools and Features

- **Violations display** lets you select a violation (or other event) in the list box to move to a point in the replay five seconds prior to the selected event. Replay lead time can be modified to zero seconds with the **Options** button on the Replay tool.
- **Slider Bar** rapidly moves the scenario to any point in the recording.
- **Camera** steps the replay eye point through different positions relative to the operator' vehicle.
- **Fast Rew** quickly rewinds the scenario.
- **Rewind** rewinds the scenario at normal speed.
- **Pause** pauses the scenario.
- **Slow** runs the scenario at slow speed.
- **Play** plays the scenario at normal speed.
- **Fast Fwd** quickly forwards the scenario.
- **Compare** vehicle position to ideal-path.

## In-Cab Camera Displays

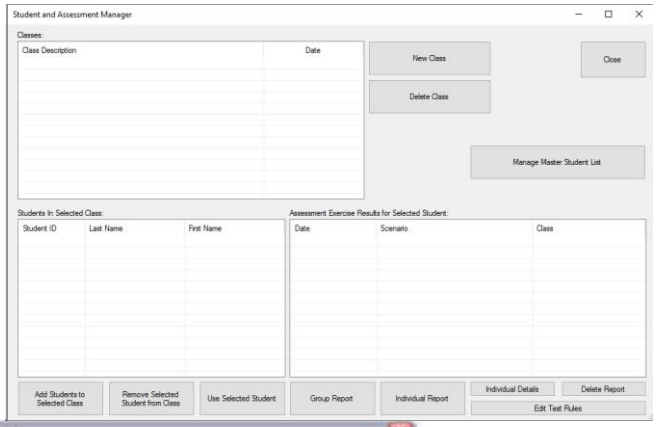
An integrated camera records the student's position, facial expressions, and hand reactions. This video feed is used to provide training feedback. In addition, the camera shows a live image at the Instructor Operator Station for observation. During low-light situations, the camera will automatically switch to black-and-white, infrared mode to maintain a high-contrast, crisp image of the driver.

The video feed can also be recorded for after-action review (AAR). Video is played back during AAR in complete synchronization with the out-the-window view of the recorded driving actions. This allows the instructor to review the actions taken during the scenario as the driver experienced it, as well as review the video of the driver's face and hands. AAR playback can also be paused and indexed forward and backward in time. The instructor can also click on a scoring violation to go directly to that point in the replay. The video replay is automatically synchronized with the simulator graphics and audio.

# Learning Management System (LMS)

The Lesson Management System (LMS) allows the instructor to create, manage and load lessons, scenario playlists, organize classes and students, and back up the student database.

## Student and Assessment Manager

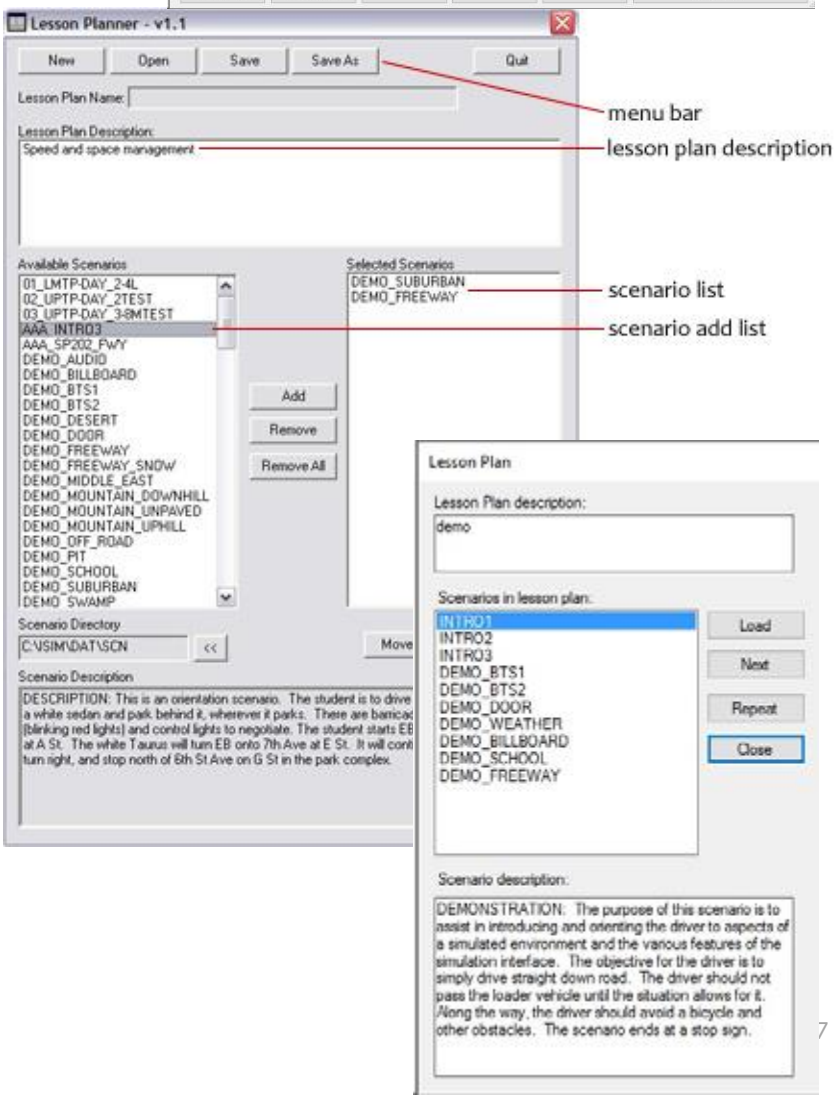



The Student Manager allows the instructor to:

- Create and manage training classes.
- Create and manage the student database.
- Assign students to training classes.
- Delete Class – removes the class from the list of classes and the LMS database.

## Scenario Playlist Editor

The scenario playlist editor provides a menu-driven interface for the creation or modification of playlists. The Planner allows the instructor to create new lesson plans or modify existing lesson plans for use in a training session. Instructor can easily add and remove scenarios that are part of the curriculum package and learning objectives for the lesson plan.



## Assessments Viewer

Access a centralized list of all assessments created and stored on the system for easy access. The Assessment Viewer also gives instructor access to the test parameter settings for the loaded assessment

## Backup Database

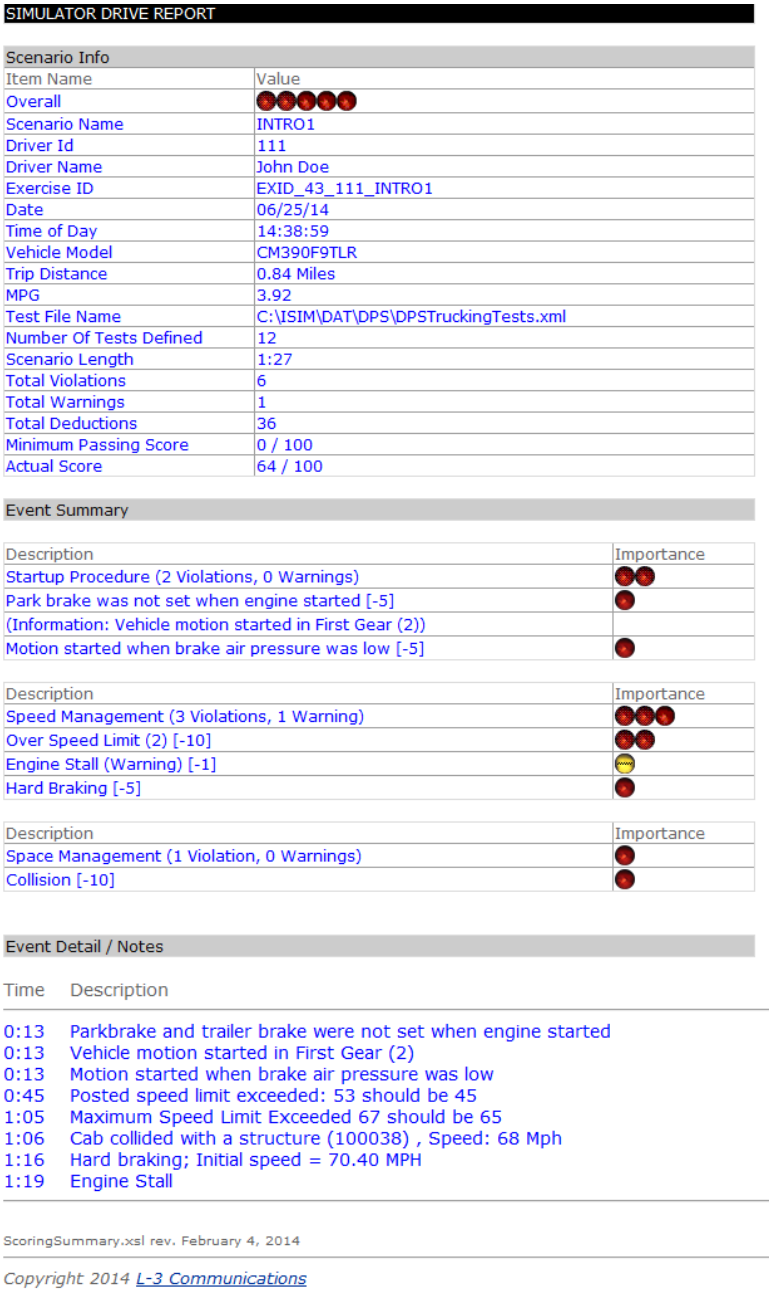
The backup utility allows the student and lesson records to backed up to a file locally on the instructor station or it can offloaded to an external device.

## Basic Scoring Report

The simulator software can automatically collect scoring data from a scenario. After a student's simulated drive, the software generates a report indicating the individual strengths and weaknesses of each driver.

The instructor can use this report to determine which drivers are most in need of training and which areas of training would be most beneficial to them.

- After data has been generated, it can be copied, archived to other locations, or purged.
- These reports offer limited editing, allowing test parameters to be enabled/disabled and violation point values to be adjusted.
- The tests include collisions, speeding, following too close, hard braking, and other factors that influence driver performance.
- Scenarios and performance data can be managed in clusters, such as lesson plans, date and location of training, and the student's organizational unit.



SIMULATOR DRIVE REPORT

Scenario Info

| Item Name | Value |
|---|---|
| Overall | |
| Scenario Name | INTRO1 |
| Driver Id | 111 |
| Driver Name | John Doe |
| Exercise ID | EXID_43_111_INTRO1 |
| Date | 06/25/14 |
| Time of Day | 14:38:59 |
| Vehicle Model | CM390F9TLR |
| Trip Distance | 0.84 Miles |
| MPG | 3.92 |
| Test File Name | C:\ISIM\DAT\DPS\DPSTruckingTests.xml |
| Number Of Tests Defined | 12 |
| Scenario Length | 1:27 |
| Total Violations | 6 |
| Total Warnings | 1 |
| Total Deductions | 36 |
| Minimum Passing Score | 0 / 100 |
| Actual Score | 64 / 100 |

Event Summary

| Description | Importance |
|---|---|
| Startup Procedure (2 Violations, 0 Warnings) | |
| Park brake was not set when engine started [-5] | |
| (Information: Vehicle motion started in First Gear (2)) | |
| Motion started when brake air pressure was low [-5] | |

| Description | Importance |
|---|---|
| Speed Management (3 Violations, 1 Warning) | |
| Over Speed Limit (2) [-10] | |
| Engine Stall (Warning) [-1] | |
| Hard Braking [-5] | |

| Description | Importance |
|---|---|
| Space Management (1 Violation, 0 Warnings) | |
| Collision [-10] | |

Event Detail / Notes

| Time | Description |
|---|---|
| 0:13 | Parkbrake and trailer brake were not set when engine started |
| 0:13 | Vehicle motion started in First Gear (2) |
| 0:13 | Motion started when brake air pressure was low |
| 0:45 | Posted speed limit exceeded: 53 should be 45 |
| 1:05 | Maximum Speed Limit Exceeded 67 should be 65 |
| 1:06 | Cab collided with a structure (100038) , Speed: 68 Mph |
| 1:16 | Hard braking; Initial speed = 70.40 MPH |
| 1:19 | Engine Stall |

ScoringSummary.xsl rev. February 4, 2014

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## Basic Scoring Data Captured

The following general information is captured for each student exercise, at a minimum:

- Driver ID
- Date and time
- Owncab vehicle model
- Exercise name
- Length of drive: distance and time
- Number of violations
- Number of warnings

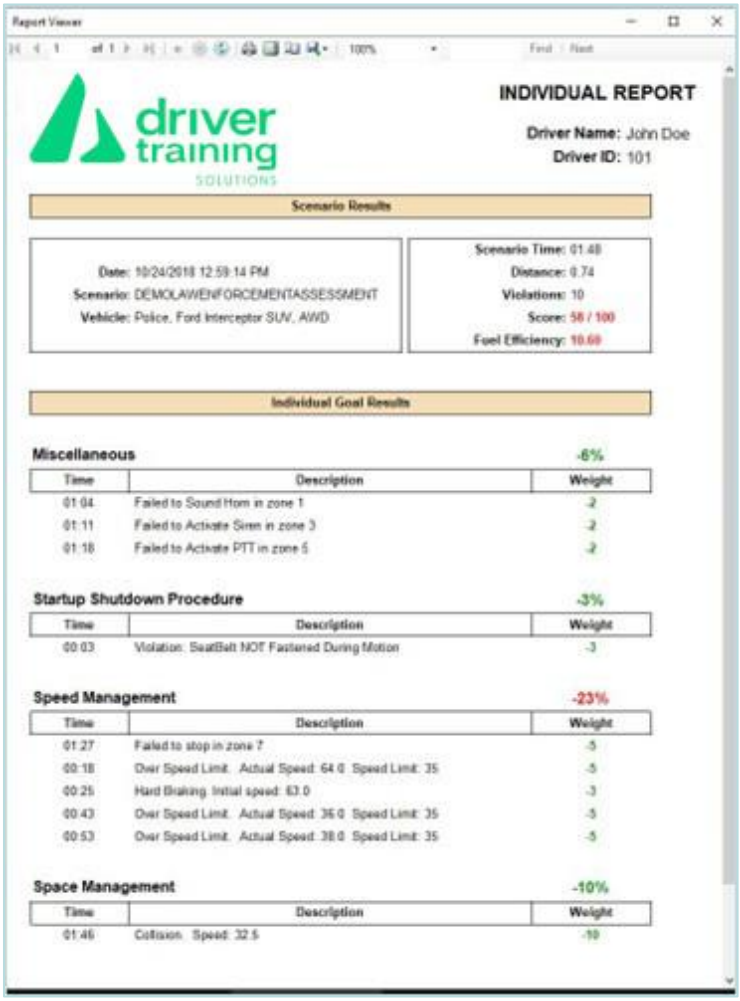
# Skillset™ Performance Assessment

- Tm0.

Skillset™ helps the instructor identify the strengths and weaknesses of individual drivers and hone in on areas requiring the most need for improvement. The results of the Skillset™ assessment can also be viewed individually or as a group and can identify skills that require further training. Students are evaluated on how effectively they have mastered handling of their vehicle, scanning and hazard detection, and compound tasks like radio commentary with dispatch or other officers.

## Scoring Criteria Always Being Monitored:

- Following distance (includes audible and visual warnings)
- Collisions
- Speeding (with allowance for law enforcement)
- Hard braking
- Failed to use hazards while in reverse
- Failed to fasten seat belt
- Improper acceleration
- Steering input while stopped (scrubbing the tires)
- Rolled over




- Vehicle moving prior to engine start
- Excessive speed in reverse
- Park brake not set prior to engine start

## Programmable Scoring Criteria

- Scenario time limit exceeded
- Reaction test (tests for reaction to an event by monitoring either brake application, accelerator release or steering wheel movement)
- Mirrors not adjusted prior to engine start
- Improper right turn
- Improper left turn
- Failed to visit specific zone
- Failed to stop in specific zone
- Entered prohibited zone
- Failed to sound horn in zone (can be used for detection of siren cadence change as well)

- Failed to activate EVO lights in zone
- Failed to activate siren in zone
- Failed to take MIC off hook in zone
- Failed to activate PTT in zone
- Failed to put MIC on hook in zone

PatrolSim™ comes standard with sample scenarios to demonstrate how to use some of the programmable scoring based tests for following distance, skills assessment, and reaction time.

## Individual Report

Skillset™ produces an "Individual Report" with all important information summarized on a single page. This single-page report format is intended for use by the instructor and student, and is available immediately at the conclusion of a simulation exercise. This report is user friendly, easy to understand, and can be viewed, printed, and archived on the IOS computer. The report addresses the following instructional needs:

- Indication that the student completed the exercise successfully, OR
- Clearly indicate skills which have not been mastered by the student, and need additional work
- Reward the student for successful completion of a test by providing a single page format which is printable and easily understood by teacher and student

All of the parameters of the Individual Report have reasonable default values. Those parameters likely to be modified frequently are editable by end-users, by means of one or more user-friendly tools.

## Group Report

The Skillset™ Assessment also produces a "Group Report", which shows the combined performance outcomes for all individual reports which have been viewed within a specific class.

## Compound Test Items

A Compound Test item is a group of test items, perhaps better referred to as a Learning Objective. The purpose of compound test items is to organize test results in terms of various general skills the student is expected to acquire. The available compound test items for the basic commercial vehicle tests include Pre-Drive Procedures, Speed Management, and Space Management. A **Generic** category is also available which allows miscellaneous test items to be created by the user, embedded in the scenario script. Any condition that can be detected in an exercise can be recorded as a test event, scored, etc.

## Real Time Reporting

While the student is driving in the simulator, the Replay Control software reports violations, warnings, and other events as they occur. A recording file can be saved, and replay can be started at a point just prior to any violation. A scroll bar allows the instructor to move quickly to any point in the recording.

## Test Parameter Modifications

All of the parameters used in student testing have reasonable default values, but are also modifiable by DTS. Some of the parameters most likely to be modified frequently are exposed in data files that are editable by end-users.

## Report Generation

Reports are generated by a process of filtering all captured data, and presenting results in a user-friendly form. For basic student reporting, reports are available in a single page “bubble” report format, as seen in the Basic Scoring Report section above.

## Instructor-operated Vehicle

The intructor vehicle (formerly known as “Rabbit Station”) is an instructor-controlled decoy vehicle station, operated from the instructor operator station. The instructor vehicle provides the trainer with the ability to control (in real time) objects in the scene. The instructor can take control of any moving entity in the scene including vehicle, animal, pedestrian, etc. The instructor vehicle operator is able to see and interact with any trainee who is driving the scenario-controlled-vehicle. The steering wheel and accelerator pedal control forward speed and steering. Top-level radar display of the instructor vehicle is used for navigational and interaction purposes.


Instructor Vehicle Controls

# 3 | PRODUCT OPTIONS

DTS offers a number of options, including hardware and software options, curriculum, training, customization, and mobile solutions, to enhance and extend the performance and capabilities of your PatrolSim™ driving simulator. Unless otherwise noted, all product configuration options listed here are an additional cost and are not included with the standard product offering. Please contact your DTS representative with any pricing or configuration questions.

## 3.1 Hardware Options

### Motion System

The PatrolSim offers a state-of-the-art 3-DOF motion platform system capability, consisting of a set of four electric motion actuators installed onto the base of the simulator. This system provides accurate and realistic per-wheel motion from the scenario including bumps, road surface vibrations, acceleration and deceleration, engine vibrations, and vehicle motion cues.

This system provides motion for the entire seat base (seat, steering wheel, transmission, pedals, dash, etc.) not just the seat. This provides a much more realistic range of motion than a typical “rumble seat” and creates a much more immersive simulated environment as well as a better over-all training experience.

- 120Hz update frequency
- 4 independent motion actuators
- 1000lb capacity
- Available for both stand-alone or trailer-mounted simulators

## Over-the-Shoulder View

The Series 8 series simulators can optionally include two additional monitors mounted to the sides of the video display unit. These monitors are 27" HD displays that show an additional 60° degree field of view in each direction for a full field of view up to 300°. Student operators are able to look over their left and right shoulders, in a genuine physical motion, and assess the status of traffic and obstacles in their respective blind spots.


## Instructor-operated Vehicle

The intructor vehicle (formerly known as "Rabbit Station") is an instructor-controlled decoy vehicle station, operated from the instructor operator station. The instructor vehicle provides the trainer with the ability to control (in real time) objects in the scene. The instructor can take control of any moving entity in the scene including vehicle, animal, pedestrian, etc. The instructor vehicle operator is able to see and interact with any trainee who is driving the scenario-controlled-vehicle. The steering wheel and accelerator pedal control forward speed and steering. Top-level radar display of the instructor vehicle is used for navigational and interaction purposes.


Instructor Vehicle Controls

# 3.2 Software Options

Numerous options are available to increase the capabilities of your simulator beyond its basic feature set. These options have been designed to provide specific sets of capabilities and meet the needs of specific requirements. Software options are needed on a per-IOS bases to reduce costs for those using multiple simulators.

## Light Vehicles Package

The Light Vehicles Package increases both the number and types of drivable vehicles and related scenarios for use on your PatrolSim simulator. These additional vehicles include:

- Generic sedans in blue and white
- Chevy S-10
- Chevy Caprice
- Chevy Tahoe
- Dodge Charger
- Ford F-250
- Ford F-150 Raptor
- Utility F-450 & F-150
- Utility Bucket Truck
- Toyota Hilux
- Land Cruiser
- Lincoln Town Car/Limo

# Virtual Environments Expansion Package

The Virtual Environments software package provides a number of additional driving environments as well as some additional scenarios and drivable vehicles.

## Desert Environment

The desert environment covers a 9km x 7km area of flat terrain, subtle elevation changes, and limited vegetation. Students practice driving on paved roads, unpaved roads, dirt roads, and open areas free of roads or trails.

## Dirt Road Environment

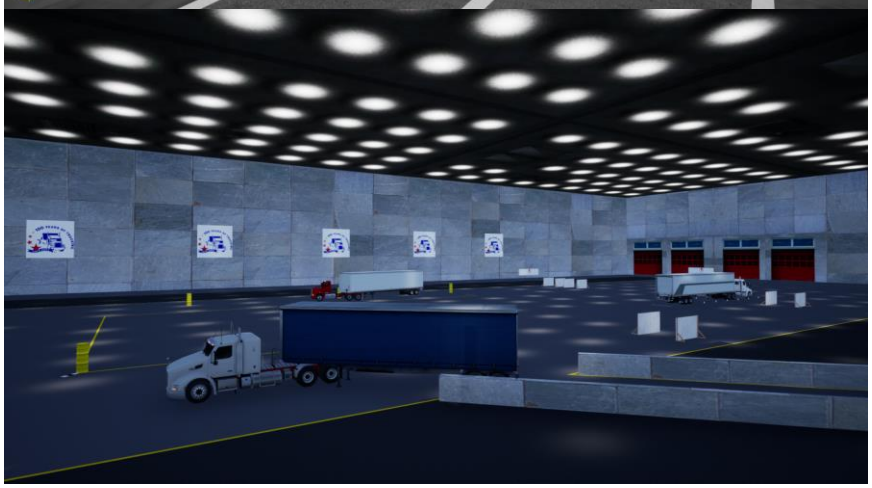
This package provides four dirt road scenarios that incorporate woods, steep grade changes, and narrow areas. Note that it is not intended for off-road driving.

## Airport Environment

The airport environment includes a generic airport with runways, taxiways, a terminal, and gates. Also included are baggage tugs and cart scenario vehicles, as well as 3 scenarios.


## Indoor Trucking Course

This course teaches students how to manage driving a semi-tractor / trailer in small areas. The scenarios include lessons on subjects such as 'completing a 9-point turn' and 'backing up in very tight spaces'. This package includes a cone course.



## Swamp Environment

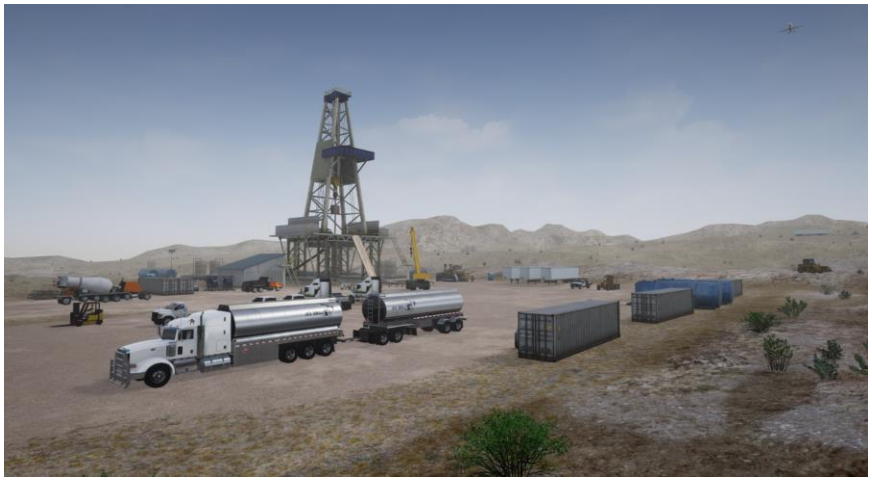
The swamp environment offers numerous challenging driving situations, including driving on dirt roads or muddy roads, maneuvering through standing water and washed out areas, manipulating road debris like logs and trenches, and managing narrow bridges.

## Mountain Forest

This mountain forest environment provides over 30km of smooth, washboard and rough dirt roads. It also includes three two-lane bridges.

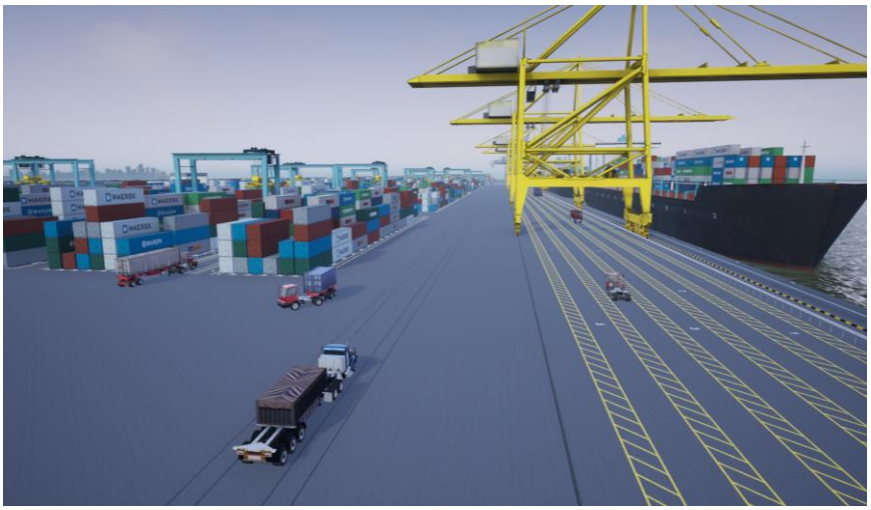
## Oil Field

The oil field environment provides multiple oil field operations in various stages of development, connected by a network of dirt roads. Several oil industry related placeable objects are also provided.



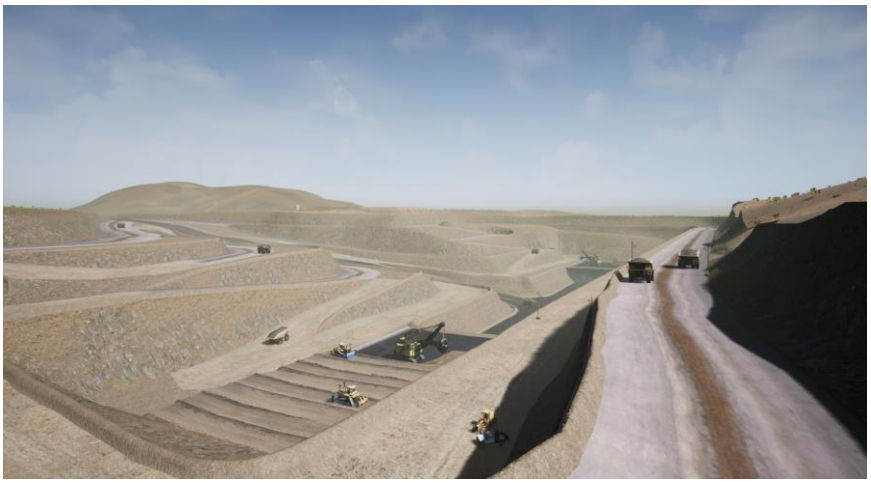
## Maritime Container Port

The port environment provides multiple container cranes in a container port setting. Drivable yard trucks are included, as well as placeable container stacks, etc.



## Coal Mine

The coal mine environment provide an operations center and two active pits, with roads that connect them all and allow terraced access into the pits.



### International Options

Options are also available to enable the International use of your simulator.

- **Metric:** Converts all road signs in all databases to Canadian metric signs. It also changes the dashboards of all owncabs, making KPH the default. This is intended only for vehicles in which the driver's seat is on the left.
- **Right Hand Drive Option:** Provides a selection of the existing environments and scenarios setup for driving on the left hand side of the road, with the driver on the right hand side of the vehicle.
- **Spanish Language Option:** A Spanish language translation of much of the software, as well as an additional driving environment is provided.
- **Arabic Language Option:** An Arabic language translation of much of the software.
- **Middle East Environment:** Provides an environment with a distinct Middle Eastern rural look and feel.
- **Power Adapters:** we have various conversion kits for power adapter and transformer requirements in your country.

## 3.3 Mobile Training Center

As an alternative to a fixed site, you may wish to have the capability to easily move your simulator(s) to other locations to manage the challenges of training 'surges', events, or geographically diverse driver populations. We can put your simulator(s) in a fully-equipped trailer, creating a mobile training center. We offer both 24 and 42 foot trailers to allow you to deliver training capacity anywhere you may need it.

# 3.4 Professional Services

In addition to the product options listed above, our program team can help develop a custom program or customize your PatrolSim™ in a large variety of ways. We can develop customized training topics and curriculum, environments, help you develop scenarios, or create custom vehicles.

## Vehicle Development Services


While your simulator comes with a large variety of vehicle types and configurations, our team can also develop vehicles exactly like those you use, down to the custom logos or graphics. This allows you to customize your simulator to portray the exact vehicles you use every day.

## Consultation Services

Our consultation and development services include initial needs analysis, the design and development of custom curriculum solutions that are based on specific learning objectives, delivery of training by qualified and experienced instructors, and comprehensive evaluation of driver skills and knowledge. We can also assist customers in measuring the performance of their drivers and ensure that return on investment is realized on all training efforts.

## Training Services

In addition to custom training engagements, we also offer standard pre-defined training service packages for various types of training needs. These include Entry-Level & Onboarding Driver training, Post-Incident Safety Training, Safety Refresher Training, and Basic & Advanced Snowfighting. Our training services team will come to your site with everything needed to provide effective training including a mobile or fixed site classroom, simulators, curriculum, courseware, and experienced instructors. This cost-effective approach to training allows you to get the training you need, when you need it, without having to manage it yourself. Contact us for more information.

## Automotive Development Services

Driver Training Solutions provides both engineering services and simulation customization that can be utilized in autmotive design, both for vehicle performance and human machine interface. Simulation dramatically reduces the timeline of the development cycle and allows engineers to iterate early, ensuring a confident and effective end result.

PatrolSim™ Product Guide



driver training SOLUTIONS