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VIRTUAL DRIVER'S ED

TODAY'S SIMULATORS PUT DRIVERS THROUGH REAL-WORLD PACES

Tire monitoring and
inflation systems

2 Commercial Carrier Journal February 2005





Using an MPRI simulator, Ace Transportation driver Anthony Delasbour is able to receive training in winter driving that otherwise would be a rare opportunity at Ace's Lafayette, La., headquarters.

REALITY SHOW

More carriers are embracing simulators and other technology to improve driver training.

By Sean Kelley

Trucker Anthony Delasbour plows down a snowy interstate near his company's headquarters in Lafayette, La. The mid-March sun may have melted much of the slush from the roadway, but Delasbour is still going too fast and isn't paying enough attention to his surroundings. In fact, a white pickup truck visible in the driver's side mirror is bleeding into his lane, perilously close to Delasbour's flatbed loaded with pipe for bayou oil fields.

In an instant, Delasbour's left drive tire blows, and his tractor – which is going more than 60 mph – dips left and collides with the pickup truck.

Had this been real, the driver of the four-wheeler would have been seriously hurt – or even killed – and Delasbour's carrier, Ace Transportation, would have been on the hook for hundreds of thousands of dollars in damages. But the accident was all part of a pre-arranged scenario controlled by Nick Treadway, a

commercial motor vehicle driving instructor at a nearby technical school.

"That happens most of the time," Treadway says with a satisfied smirk from the safety of his desk in the front of a 53-foot air-conditioned trailer. With the click of his mouse, Treadway has caused the blowout in a high-tech truck-driving simulator Delasbour is using 20 feet away. Treadway is at the head of a classroom where three other drivers view Delasbour's crash on a large flat-screen monitor. The results are visible even if the accident is virtual.

Delasbour, a veteran driver with more than 30 years on the road, says the simulator is impressive, even if it isn't reality. "You don't have a feel for the road, but it acts the way a truck would," he says.

Truck driver training has come a long way in recent years with the development of sophisticated simulators, educational software and monitoring systems designed to improve the skills of new

drivers and veterans alike. Although nothing has replaced the experience drivers gain behind the wheel, training technology – and the methods developed to implement it – has improved substantially. Carriers are investing substantial sums in motion-based and stationary simulators, integrating real-world video of their own drivers into their training sessions and testing truckers via the Internet on everything from city driving to border-crossing procedures.

Although safety remains the core aim of adding technology to driver training, carriers say there are productivity and retention benefits beyond just avoiding accidents. Whether it's getting new drivers on the road faster or evaluating new hires before they hit the road, the benefits offered by technology are producing a return on investment beyond its cost.

Statistics tell the story

Nowhere has the investment in training technology evolved more than with simulators. Only a few large carriers – notably Werner Enterprises, J.B. Hunt, Maverick, Bison Transport and Swift – have high-end simulators, but the market is about to take off. The reason: Even the most expensive simulators are showing a return on investment.

Schneider National inked a \$5 million deal last fall to install more than 50 high-end driving simulators across the country. When it considered making the expenditure, the company didn't bake soft numbers into the equation as is often the case with safety-based technology, says Don Osterberg, vice president of safety and driver training. The Green Bay, Wis.-based company was able to justify the cost with its new drivers program alone, though it expects every one of its 16,000 drivers to sit in a simulator annually.

one of Schneider National's training program. As the trainees matured into over-the-road drivers, the success and retention rates continued to improve. Eighteen percent more drivers in the simulator group made it all the way through the training process to become Schneider drivers.

"One of the prime reasons for turnover in the first 90 days is anxiety," Osterberg says. "Drivers get out on their own for the first time, and the job is stressful. They hit overload and quit. We had roughly 10 percent better retention with drivers trained in the simulation group during the first 90 days. If we can retain drivers after 90 days, we can keep them around for a long time."

The retention alone might justify the \$5 million tab for a trucking company that must hire hundreds of drivers each week. But the simulation training not only helped with retention, it improved

Bison looked at the number of preventable accidents for a group of 474 drivers before and after they had been through driving training that included time on the simulator. Before the training, the group averaged 432 days between crashes. Afterward, the gap increased to 793 days.

Klassen admits the group of drivers could have been responding to other training elements, weather conditions could have been milder in the second time period – or the group could have gotten lucky. "You have to take the numbers with a grain of salt," Klassen says. "But what it indicates to us is the numbers are trending in the right direction."

Training for everyone

Still, the experience of Bison Transport and Schneider National is catching the attention of other large carriers. "Over the last three years, we've doubled the number of simulators we've fielded," says Jim Naatz, vice president of sales for MPRI. "The larger carriers in the truckload market already have integrated training programs and infrastructure to take advantage of simulators. By end of year, we expect to have eight of the top 10 truckload carriers as our customers."

Large carriers aren't the only ones interested. A consortium of medium-sized and small carriers in Louisiana put together a \$1.5 million grant to outfit a tractor-trailer with a mobile classroom and four simulators. The group, which includes Ace Transportation, rotates the mobile simulator between its companies weekly and customizes training: A couple of the carriers haul heavy flatbed, while another pulls liquid bulk trailers. The training is designed to improve the skills of professional truck drivers in areas such as shifting techniques, fuel management, emergency maneuvers and speed and space management.

Although not a small carrier, Dart Transit also bought a mobile simulator – one originally owned by the Texas Motor Truck Association – and leases it out to other carriers for training. "It's not really a

Safety remains the core aim of adding technology to driver training, but carriers say there also are productivity and retention benefits.

Osterberg says Schneider began evaluating the technology in 2004 with an ambitious pilot program. It split a large group of new drivers between its traditional training program and a new educational regimen that incorporated a Mark III full-motion simulator made by MPRI, a division of L3 Communications, and the only producer of motion-based simulators in the trucking industry. Drivers in both groups were new to trucking and were in Schneider's CDL program.

Among the two groups, there were measurable improvements – albeit small – in the success rate of drivers whose training included simulators. "In the simulator group, roughly 85 percent of drivers graduated," Osterberg says. "Only 77 percent graduated with the control group." That was just in phase

driver performance as well. The group of drivers who trained on the simulator showed a modest decrease in the number of reportable and preventable accidents. The same group also showed an important decrease where it counts the most: In accidents with an exposure greater than \$15,000, the simulator group had 30 percent fewer accidents.

"There were 1,200 drivers in this pilot program," Osterberg says. "The results were statistically significant."

While Schneider has measured the impact on new drivers, Bison Transport – which has been using a simulator since 2002 – has studied the impact its simulators have on training of current drivers. David Klassen, manager of driver development for the Winnipeg, Manitoba-based company's 1,100 truckers, says



CHANGING TECHNOLOGY

Many other methods available to teach drivers the rules of the road

Jack McPeek learned how to drive a truck from his father. To his mind, that's still the best way to train a driver – with personal interaction.

"Personally, I wouldn't trust just a simulator to teach a person how to drive a truck," says McPeek, vice president of training and development for Superior Bulk Logistics.

But even an old-school trainer like McPeek sees value in driver training technology – whether it's simulators, computer programs, distance learning over the Internet, Powerpoint presentations, data from engine computers or even video from truck-mounted cameras.

SOFTWARE: Educational software may have had a bigger impact on training technology than the development of simulators. According to E. Bruce Weiss, executive vice president of Instructional Technologies Inc. – maker of Tread-1 and Pro-Tread driver training programs – today's software allows carriers to do three important things: train more drivers more effectively, make the training consistent across the entire fleet and document the training.

"How often do you get 90 percent of your drivers in a safety meeting?" Weiss says. "When they're there, all you get is laughter."

Software-based programs not only ensure drivers receive frequent safety education, but also make sure drivers are absorbing the lessons. Tread-1 requires a driver to score 100 percent before he can move on to the next lesson, something Weiss likens to military training.

"You don't get 85 percent on the howitzer – you either master it, or you don't do it," Weiss says. Training software also builds in redundancy, repeating questions to make sure drivers aren't just guessing the right answers.

Technology also has made education more available and consistent. Most commercial training programs – from Smith System to Carrier's Edge – have moved to the Internet, and drivers can take courses anywhere they have access. Weiss says large carriers with multiple terminals and trainers also know the same safety message is being delivered to drivers, regardless of location. "The training is consistent – that's what technology can do," Weiss says. "You can't do that when you just have trainers."

Finally, the training technology can give carriers an edge even when the training has failed to prevent an accident. Most programs allow for some form of recordkeeping, so if a carrier is consistent in its training and can show that a driver at fault in an accident has been through its training regimen, punitive damages may be mitigated in a judgment, Weiss says.

HARDWARE: Carriers are tapping into systems aboard trucks to help training. Iowa-based Jacobson Transportation, for example, has used ECM data for years to track incidents of hard braking, speeding and excessive idling. Drivers sit down with managers and are shown the data during safety meetings.

Carriers also are turning to video from onboard cameras as part of safety instruction. A DriveCam system used principally in light- and medium-duty applications records significant events like hard braking, tailgating or swerving. The events are captured by a palm-sized video recorder mounted in the truck, and those video clips are downloaded automatically to a computer via a USB or wireless connection.

Carriers either rely on DriveCam to analyze events or use software to review and analyze drivers' incidents. The video can be used as part of remedial training with individuals or groups, and the system allows carriers to practice remediation before an accident occurs. "You can identify behaviors before they become bad habits," says Del Lisk, DriveCam's vice president for safety services.

Technology also can aid drivers hundreds of miles from the classroom. OEMs have built-in digital readouts that track MPG, and drivers who monitor those readouts often show improvement in fuel efficiency. Similar devices also can teach proper shifting: GearMaster provides a graphic display that shows drivers when to shift and into what gear.

The technology is making better drivers, trainers say, but the technology is only as effective as the program. And experts say the technology alone cannot make drivers better: Personal instruction remains important. McPeek says Superior Bulk Logistics still leaves the decision to let a driver out on the road up to the trainer.

"Some people really buy into the training," says driver instructor Nick Treadway. "Some come out of a simulator or away from the computer-based training with a good attitude." Others will be bad drivers no matter how much training they have. Treadway told four trainees in March about a trucker who recently had been in for training after getting a speeding ticket for going 109 mph. "He bragged about how it wasn't his only ticket. Two days in a simulator isn't going to change him."

▶ Nick Treadway, an instructor with Louisiana Tech University, speaks to drivers in a mobile classroom complete with four simulators.

profit center for us,” says Elaine Briles, director of safety, compliance and fleet services for Eagan, Minn.-based Dart. “We let competitors, leased carriers, anyone rent it from us for cost.”

When TMTA owned the simulator – a motion-based Mark II made by MPRI – Dart would lease it from TMTA. At a cost of more than \$1 million in 2002, the mobile simulator was more than most carriers wanted to spend on the technology.

Now, however, the price for a top-of-the-line Mark III simulator and its cheaper fixed-base simulator, the TranSim VS III, are within reach of more modest carriers – especially if the experience gained in using the simulator reduces accidents.

The training

Simulators are attractive to carriers and trucking schools that train new drivers because they can get students on the road more quickly – both virtually and literally. With many fleets having to train hundreds of drivers a week just to keep up with turnover demand, simulators give students experience on equipment without leaving the classroom.

“With simulators, we can train more quickly,” says Schneider’s Osterberg. “There’s a limiting factor in training – we only have so many trucks and so many trainers. We have to have drivers out with an instructor running them around the training yard. It used to take a day and a half to get a driver out on the road. Now we can do that in half a day with the simulators. They can demonstrate proficiency out on the street by the end of day one.”

They also are attractive as tools for veteran drivers, whether as part of ongoing training regimens or for remedial lessons after an accident. For the last two years, Superior Bulk Logistics has used Safe-Sim, a PC-based desktop driving simulator made by J.J. Keller (see “Some simulators cost real money ...” page 72), as part of its recertification program for



Sean Kelley

HOW REAL IS VIRTUAL REALITY?

Some trainers recommend keeping cleaning supplies nearby

When veteran drivers first step into Dart Transit’s Mark II driver simulator, most of them think it’s a game, says Elaine Briles, Dart’s director of safety, compliance and fleet services.

“But when they get in it, it’s very real for them,” Briles says. Drivers soon forget they’re in a simulator. “When you get the rocking motion of pulling onto the road from the shoulder, it’s realistic enough.” In fact, when Briles has put some drivers into rollovers, she has heard screams.

“When we first got our Mark III, it could throw you around violently if you weren’t paying attention,” says David Klassen, manager of driver development for Bison Transport. “It can bruise shoulders and elbows if you have a jackknife.”

It also can cause motion sickness in some drivers – especially drivers who have been on the road longer and may have a harder time adjusting to the simulator. Trainers recommend you keep cleaning supplies nearby.



tank haulers who have had preventable accidents.

“We’re teaching defensive driving techniques with it,” says Jack McPeck, vice president of training and development and an instructor for Oak Brook, Ill.-based Superior. “We put them all on the simulator. It’s great for hand-eye coordination, and it raises the awareness of what’s on the road.”

Drivers selected by the company’s safety department for additional training come into McPeck’s office for a program tailored to their particular needs. Drivers view videos, receive instruction and spend time on the simulator going through multiple scenarios. The Safe-Sim has 750 miles of roads in it and can be tuned for urban or rural routes, day or night driving and various weather conditions.

Similarly, MPRI’s Mark III and TranSim VS III both offer dozens of scenarios – all customizable by the instructor to increase difficulty. Users of MPRI’s simulators can choose from among 140 transmissions, 240 engines, 300 tire sizes and 33 axle ratios, offering a wide range of customization to fit a carrier’s particular tractor and trailer setup.

That customization also helps carriers focus on particular problems. “If you’ve had a rash of rollovers or jackknives, you can train for that situation,” says Dart’s Briles. “You can replicate whatever the cause of the accident is. You can work with a driver, where in the past you might have terminated

him.”

Bison Transport requires its drivers to go through a winter challenge course, which combines slick streets and mountain pass scenarios. “With the latest software, you can control resistance on the road,” Klassen says. “You can add rain, snow, sleet, winds, tunnels, grades. With the maximum slipperiness on, even the best driver has a hard time keeping it on the road.”

It’s hard to put a value on this kind of training, instructors say. In the past, simulation-based training for winter driving conditions was instruction- and experienced-based, but now fleets can teach the principles and let drivers put it into action without risking equipment.

“One driver who had driven for 27 years said people have been telling him how to drive on ice for his entire career,” Briles says. “In there, he finally figured it out. You can focus on what you’re doing and not worry about other cars or crashing.”

The same concept is true for routine issues like steer-tire blowouts. Before simulation, instructors only could tell drivers what occurred during a blowout incident. But with simulators, which incorporate force feedback through the steering wheel, a blowout can be experienced for the first time in controlled circumstances.

Beyond safety

Simulators also are being used to teach fuel-efficient driving and train drivers in proper shifting techniques. "We did a lot of training on fuel economy with the company fleet, and we saw pretty significant improvement," Klassen says. "We improved fuel economy by 2 percent. That's 770,000 liters annually at 70 cents a liter."

The fuel economy gain even has been a benefit with automated or automatic transmissions. Bison still uses its simulator for fuel efficiency training even though it has shifted largely to autos in its company trucks. For fleets with manuals, MPRI's simulators can be set up to teach shifting techniques without putting additional wear on company equipment. Driving schools, in particular, are using this feature to speed up training time and free up student tractors for over-the-road training.

"We can do some customization for customers, too," MPRI's Naatz says. "We simulated Schneider National's skid pad for them."

But the focus is clearly on safety, and that's a place where fleets are seeing the biggest return on investment. After Bison endured a rash of severe rear-end collisions in 2003, the company started to train its veteran drivers using a following distance program that focuses on the seven-second rule. After a year of training, Bison saw a 38 percent reduction in the number of such accidents over the first three quarters of 2005 compared to the same period in 2004. The company also saw a 30 percent reduction in costs.

Still, Bison experienced a spike in such accidents in the last quarter of 2005, and though Klassen thinks it's an anomaly, he says there's still not enough data to prove the company's investment in simulators has paid for itself. The company's investment is significant: Not only has it purchased the equipment and the curriculum, but it also has constructed a new building to house the simulators.

"In terms of dollars and cents, it's a fairly significant investment," Klassen says. "But we see a trend in the right direction, and we think it's worth it." ■



SOME SIMULATORS COST REAL MONEY...

... but in recent years, prices have come down and the product is better

Although the two truck-driving simulator models offered by MPRI remain costly, they are nowhere near as expensive as in past years. The TranSim VS III costs roughly \$100,000, and the Mark III costs less than \$300,000, says Jim Naatz, vice president of sales for MPRI. "For lesser technology five years ago, you would have paid five times that," Naatz says.

The biggest difference between the two models is motion. The Mark III is more realistic: A driver sits in the cab of a truck looking out real windows, and the cab is mounted on legs that allow for six degrees of movement. And the Mark III uses high-resolution projection imaging on three wall-mounted screens to create a 180- to 360-degree field of vision.

The TranSim VS III, on the other hand, doesn't move. Drivers still receive substantial feedback through the steering wheel during turns, blowouts and sloshing loads. The images on the three plasma screens that serve as windows for the simulator tilt with the motion of the truck, giving the simulator the feel of movement. And like its bigger brother, the VS III features sharp visuals and lots of customizable options.

J.J. Keller's Safe-Sim desktop simulator offers a less expensive option. Safe-Sim's steering wheel and pedal setup, along with software and instructor manual, costs \$2,495. A high-end desktop PC with a 19-inch monitor is required to run it.

The difference in price is due largely to the environmental difference between a full-featured simulator and Safe-Sim, which can be an effective training tool in certain situations. "The purpose behind the product is not to teach shifting a transmission," says Keith Keller, product development manager. "It's for safety training. We wanted to build a simulator that's affordable."

Keller compares the Safe-Sim to PC-based flight simulators, which pilots often use to brush up on some techniques. Carriers are using Safe-Sim to reinforce proper driving skills and to identify unsafe driving behaviors that drivers may have developed while on the road.

Like the MPRI simulators, some schools are using Safe-Sim to train drivers, and an unexpected market has developed for the less-expensive device: Prisons are using them to train inmates who eventually will rejoin the work force. "It's part of a work-study program," Keller says. "They don't want to put them in real trucks because they tend to drive off the property."

Safety. It's not a competitive issue.



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