

Blind Driver Brings New Technology To Daytona Speedway

Kyle Hightower, Associated Press

DAYTONA BEACH, Fla. (AP) — It's a cloudy morning at Daytona International Speedway, but Mark Riccobono can't tell, nor does it really matter to him.

He walks up to the driver's side of a black, Ford Escape Hybrid parked on the start-finish line, opens the door, sits down and adjusts his seat. After a few minutes the car revs up and takes off.

None of that's unusual at one of the meccas of motorsports racing, except for one thing: Riccobono is blind.

Saturday, Riccobono will take part in a public demonstration, driving independently with the help of new nonvisual technology and a specially modified car. The event, spearheaded by the the National Federation of the Blind, is part of the pre-race activities of Saturday's Rolex 24 event at Daytona. Riccobono will drive a portion of the same course as the drivers in the race.

"I pretty much shut out the idea that driving was possible, because I didn't want to focus on that aspect of something I couldn't do," said Riccobono, 34, who has been legally blind since age 5 and was selected from a group of test drivers to be behind the wheel Saturday. "But I think this project is a clear example that when you dream big and put your heart and resources into it, you get to unimagined places."

The NFB, an advocacy group of more than 50,000 members, hatched the idea a decade ago.

In 2004 it began the Blind Driver Challenge through its Jernigan Institute. The challenge encouraged partnerships with universities and manufacturers to create technology that would enable a blind driver to safely operate a vehicle.

Saturday's event has been in the developmental phase for the past three years thanks to the NFB's partnership with Virginia Tech's College of Engineering and TORC Technologies. The students developed the equipment Riccobono will use. TORC integrated those into a working vehicle.

Several Virginia Tech students teamed with TORC and won \$500,000 when they placed third in a 2007 competition put on by the U.S. Defense Department to build a fully robotic vehicle. So when Dr. Dennis Hong, director of Tech's Robotics and Mechanics Laboratory (RoMeLa), heard about NFB's challenge, he thought it was a no-brainer to get involved.

"We said, 'Hey, we already have a fully-autonomous vehicle, how difficult would it

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be to put a person inside?" Hong said. "We couldn't have been more wrong. They did not want a vehicle to drive a blind person around. They wanted a vehicle that a blind person could make active decisions in and actually drive the vehicle. So we had to start from scratch."

Hong said the biggest challenge was figuring out a way to convey real-time information to a driver who can't see. They came up with a combination of mounted laser and camera sensors around the vehicle, which scan the environment and feed information to sensors worn by the driver.

Working with just \$5,000 in initial funding, the first vehicle they built in 2008 converted a dune buggy they bought on eBay for \$2,000. That car featured vibrating chairs and vests and was debuted in the summer of 2009 during a program the NFB held for 175 high school-age blind students. The BDC is now funded through grants.

The Ford Escape Hybrid that will be used Saturday is fitted with more elaborate lasers and a camera system designed by TORC that will react with the new DriveGrip and SpeedStrip devices the Virginia Tech students designed.

DriveGrip consists of two gloves that send vibrations over the knuckles to tell the driver how much to turn the wheel. SpeedStrip is a cushion down the back and legs of the driver which tell them how much to accelerate.

"One of the main things I want to do is build technology that helps society," said Paul D'Angio, 23, the lead Virginia Tech grad student on the project. "You can work with the military and make plenty of awesome technology, but it won't help people until years later ... This is something happening now."

Anil Lewis, the NFB's director of strategic communications, trained alongside Riccobono to drive the Escape. He didn't lose his sight until age 25 when he developed an incurable form of blindness called retinitis pigmentosa. Having learned to drive as a sighted person, he said relearning to drive blind wasn't a big difference.

"It's very close to the same kind of learning curve as a sighted person learning to drive," said Lewis, 46. "You learn different techniques, but as you drive you get more comfortable. ... After a while it gets kind of second-nature."

Riccobono, now the director of the Jernigan Institute, was born with aniridia, a congenital disease in which a person is born without an iris in one or both eyes.

With only 10 percent of normal vision at age 5, he continued to lose vision throughout his childhood. He lost all of the vision in his left eye in the eighth grade. Now 34, he's also lost most of the vision in his right eye, having only light perception of colors and shapes.

Now, Riccobono will be helping break new technological ground. Though, he admits, preparing society for a true blind driver will be a bigger hurdle.

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"Hardly anybody in the world believes a blind person will ever drive," he said. "It's going to be a lot of work to convince them that we can actually pilot a vehicle that is much more complex and has much more risk. Now we have to convince society that this demonstration is not just a stunt. It's real. It's dynamic research that's doing great things."

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