

Toyota Racing Development Hosts Inaugural Global Simulation Summit: ‘We Blew a Lot of Minds’

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For Steve Wickham, the inaugural Toyota Global Simulation Summit — hosted by Toyota Racing Development (TRD) earlier this year in and around TRD’s facility in Salisbury, North Carolina — was 10 years in the making. But those in attendance know they can’t afford to expend the next 10 years figuring out how to take full advantage this technology.

On the one hand, motorsports teams have long relied on what’s referred to as driver-in-the-loop simulators to speed up the process of testing and iterating chassis designs that will make race cars go faster. Wickham, TRD’s business development director, has had a front-row seat on that journey since TRD deployed its first simulator in 2009.

On the other hand, he’s seen the demands on TRD’s production-vehicle engineering counterparts grow exponentially as they’ve been challenged to bring ever-more sophisticated mobility solutions to market faster and, often, with fewer resources.

The summit was the intersection of those two trend lines.

“Over the years, I’ve built up a network of people within Toyota who have an interest in what simulation can do. But it’s been primarily in the form of one-on-one conversations,” Wickham said. “What I sensed was that there was a desire to connect with one another. COVID delayed that. But given the need, I knew it was inevitable.”

And he was right.



Command Center — Here's the business end to TRD's driver-in-loop simulator.

In the end, the three-day summit drew together some 40 attendees in person and an equal number via a video link representing five countries and numerous Toyota affiliates, such as Toyota Motor Corporation, Toyota Research Institute, Toyota Connected, Toyota Motor North America, Toyota Motor Europe, Toyota Gazoo Racing and Woven Planet Group. The first day was dedicated to presentations and open discussion, the second to experiencing TRD's simulation capabilities firsthand and the third to a tour of some of Toyota's North

Carolina-based racing teams' high-tech facilities.

“I think we blew a lot of people’s minds,” Wickham said. “We also discovered that, lo and behold, there were a lot of people facing similar challenges, but approaching them in different ways.”

The core technology takes two basic ingredients: 1) hardware, where a human driver takes a seat behind an actual steering wheel and reacts to a representation of an actual driving experience; and 2) software, where a virtual vehicle exists in a computer where it can be tested, probed and manipulated.

Both figure to play important roles as Toyota’s engineers around the globe push the envelope on what the company’s production vehicles can do — especially in potentially hazardous situations that are best not put to the test on public roads.

Autonomous driving is a prime example of where this technology could prove invaluable. But even for more conventional vehicles, driving simulation could potentially shorten the time from concept to finished product, thus reducing costs.



Taking It for a Spin — Vangelis Kokkevis, director of simulation for Woven Planet North America, takes a seat behind the wheel of TRD's driver-in-loop simulator

“This could be a big sea change for Toyota,” Wickham said. “We have a long history of building lots of prototypes until we get one that is quality perfect. But in the future, would it be possible for us to bring a car to market without a physical prototype? We have a very long way to go before that happens. But if we did, the savings would be enormous.”

For now, it's enough that the key players have been identified and are talking with one another. One thing seems certain: It won't take another 10 years before they gather for the second Global Simulation Summit.

"There were so many great interactions and some 'a-ha' moments," Wickham said. "My hope is that there will be follow-up meetings and we can continue to identify common paths. We're off to a great start."