https://www.businessinsider.com/aurora-ceo-virtual-tests-better-than-real-world-tests-2020-2

We've been focused on telling the story of Aurora's Virtual Testing Suite and how our approach allows us to make progress faster than others, and do so efficiently and safely. Here's a story we worked on with Business Insider about the topic. As @curmson said to the reporter: "We made a few big bets, and they're paying off."

The CEO of the Amazon-backed self-driving car startup Aurora explains why testing its tech on a computer is better than testing it in the real world

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- **Aurora is developing software and hardware for autonomous vehicles with the goal of acting as a supplier to other companies, instead of making its own self-driving cars or ride-hailing service.**
- **Chris Urmson, the company's CEO, said using simulations and other virtual methods to test the company's tech is more useful than running tests on public roads.**
- **If you want to test a specific situation, you can repeat it more quickly in a computer than in the real world, Urmson said.**

- **But Aurora still does real-world tests.**

The billions of dollars being spent on self-driving cars has spurred interest in determining which autonomous-vehicle companies have the best technology. Sorting them out isn't easy, since the tech is just starting to be used in small-scale ride-hailing services. Cars that can drive anywhere without human assistance are still decades away.

The public has been left to make guesses based on the amount of money each company has raised, the number of test miles it has driven, the automakers it's partnered with, and whether its tech has been used in a commercial service. But those criteria are imprecise, the autonomous-vehicle startup Aurora Innovation has said.

Founded in 2017 by veterans of Google, Tesla, and Uber's self-driving car projects, Aurora is developing software and hardware for autonomous vehicles. Rather than making its own cars or ride-hailing service, the startup plans to act as a supplier to automotive, tech, or logistics companies.

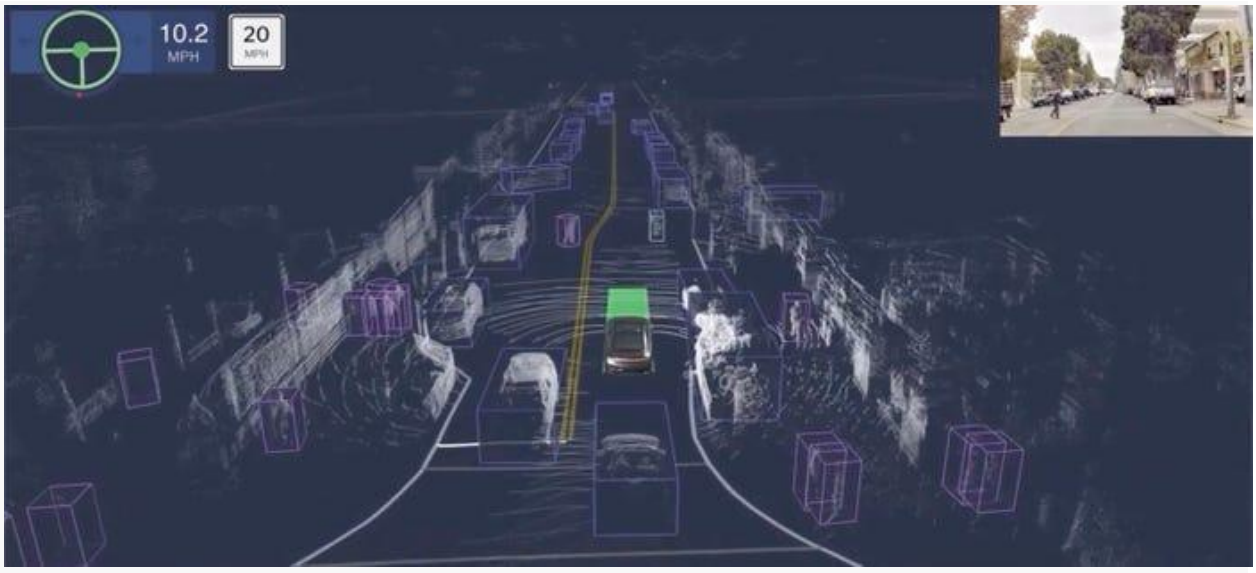
Aurora has argued that the standard metrics used to compare autonomous-vehicle companies aren't meaningful, and Chris Urmson, Aurora's CEO, told Business Insider that the company doesn't have a responsibility to convince the public it's ahead of its rivals.

"That's not our job," Urmson said.

When an automaker is developing a new car or a tech company is making a new phone, its doesn't give detailed updates about its progress, he added. Urmson instead sees value in educating the public about why self-driving tech is important and how it will work.

"I think understanding that this technology is coming and all of the benefits it's going to bring and some of the challenges that will come with that, of course, is super important," Urmson said. "But, as the public, does it really matter which of these companies is ahead?"

Virtual tests have a big advantage over real-world tests



Aurora's virtual testing system. Aurora Innovation

While Urmson may not find such signals useful, Aurora has the support of big-name investors like Amazon and Sequoia Capital, and partnerships with Hyundai and Fiat Chrysler, which suggest Aurora's technology has promise.

The company has distinguished itself from competitors with its emphasis on virtual testing over trials on public roads, using computer simulations and data collected from on-road tests to train its software and hardware. A mile driven in its virtual testing system can be as valuable as 1,000 miles driven in the real world, Urmson has said, because in virtual testing, you don't have to wait for a specific situation to happen. Instead, you can quickly repeat it and create any number of variations on it.

That's helpful when Aurora is trying to fix a problem with a particular scenario or maneuver. Being able to rapidly test how the new code performs gives the company more confidence that it's solving the issue, rather than merely getting lucky during a single real-world encounter.

"We believe you get a massive amplification and acceleration by doing more work in simulation because you don't have to drive the car somewhere," Urmson said. "You can teleport exactly to the thing that we're trying to develop against and learn from."

But real-world tests are still necessary

A vehicle equipped with Aurora's technology. Aurora Innovation

Of course, you can't do all of your testing on a computer.

"We don't believe that the answer can be only simulation. We think that it is important to do physical-world testing," Urmson said.

Aurora uses those on-road tests to target specific maneuvers the company can control. Data from those tests also help Aurora's virtual-testing system reflect real-world conditions.

If the company wants to work on unprotected left turns, for example, it will begin by having a human driver make a large number of unprotected left turns to collect data Aurora's tech can learn from. Once Aurora's tech has completed enough successful virtual tests, the company will allow it to make unprotected left turns in the real world, with a safety driver ready to take control if it makes a mistake.

The real test of Aurora's simulation-heavy approach will come once its tech makes its way into consumer vehicles or a ride-hailing service. Aurora has not said when it expects that to happen, but Urmson believes the decisions the company has made so far, including its focus on virtual testing and its 2019 acquisition of the lidar startup Blackmore, have been the right ones.

"We made a few big bets, and they're paying off," Urmson said.