

Google Self-Driving Car Project

What's new — May 2015

Our fully self-driving vehicle prototypes will soon be tested on city streets. We've built 25 so far, and this summer we'll introduce them a few at a time to the streets near Google in Mountain View, CA. They use the same software and sensors as our existing fleet of 24 Lexus vehicles, which have self-driven nearly a million miles safely. Our safety drivers will be aboard, and they'll have removable steering wheels, accelerator pedals, and brake pedals so they can take over driving if needed.

Our Lexus vehicles have been self-driving on Mountain View city streets for the last few years, but the arrival of our new self-driving vehicle prototypes marks the start of a new phase of our project. We're proud of our driving record and development so far, and this new stage will help us understand what it really means to have self-driving vehicles in the world -- both how people in the community perceive and interact with them, and what the practical realities are for us in operating and maintaining them.

Before the vehicles take to the streets, we'll be launching a website about the project (which joins our existing [Google+ page](#)), and it will have a place for Mountain View residents to share their thoughts. We'll also begin posting regular updates on how things are going (e.g. interesting trends and incidents we've experienced).

Other things we've been working on in the last year

Continuing to refine our software by self-driving ~10,000 miles of city streets every week. The vehicles in our fleet are now comfortable handling the wide, sunny boulevards and quiet residential streets of Mountain View. So we're going to begin sending our Lexus vehicles to some new testing locations that give us a variety of experiences with bad weather, traffic patterns and topography. For example, San Francisco would give us good experience with hills and fog, as well as traffic patterns that are different than what we see in Mountain View's suburban streetscape.

Developing our software's ability to handle rare and weird situations on the road. We need to be prepared for the .001% edge cases that could pop up on the roads, even if we've never seen them before in our real world driving.

[see next page for more]



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How we tackle the .001% – the stuff you see maybe once every 100,000 miles

We have a team dedicated to conducting complex field tests with the vehicles (both Lexus and prototypes) on our test track. We also use our software systems to run virtual versions of the tests. (One of the beautiful things about our self-driving software is that it can get practice without a car ever leaving the garage!)

This testing helps us **validate that our software handles even the rarest variations on common driving scenarios**. For example, in everyday driving we might see a mail truck pulling out suddenly from the curb into our path because the driver didn't see us. Our testing team can run the car through thousands of variations on that basic scenario. They could vary the speed, angle, and start point of our vehicle and the other vehicle. They could vary the other vehicle's type & shape. Or try out different roadside types (shoulders, driveways, bike lanes) and geometries.

It also helps us **accelerate our discovery of rare and weird situations**. We dream up challenging scenarios to run the car through, and then we stage them on our test track. We get inspiration from what we see or hear stories of on the roads every day...and then we make things even weirder and harder. This is important because we can't wait months or years to encounter these things in everyday driving.

Additional resources

["Green lights for our self-driving vehicle prototypes"](#) – May 2015

["The view from the front seat of the Google self-driving car"](#) – May 2015

["Just press go: designing a self-driving vehicle"](#) – May 2014

["The latest chapter for the self-driving car: mastering city street driving"](#) – April 2014

["The self-driving car logs more miles on new wheels"](#) – August 7, 2012

["What we're driving at"](#) – October 9, 2010

The New Yorker, ["Auto Correct"](#), November 25, 2013

The Atlantic CityLab, ["The First Look at How Google's Self-Driving Car Handles' City Streets"](#), April 2014

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