

Google to test cars without a driver

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Google plans to begin testing its new prototype of a self-driving car - which, unlike earlier models, doesn't require a back-up driver - at NASA's Ames Research Center, just a few miles from the tech company's headquarters, space agency officials said this week.

Because the testing area is a federal property, Google cars can drive the network of streets that criss-cross the sprawling, 2,000-acre research facility without worrying about California regulations that say a human operator must be able to take control of self-driving vehicles during testing on public roads.

Testing of cars without drivers could begin at early next year, according to a statement from Ames associate director Deborah Feng. NASA is working with Google on the project and hopes to gain useful information

for its own efforts to develop unmanned drones and [air traffic management](#) systems.

The Google cars are one of several projects run by the company's secretive X division, overseen by co-founder Sergey Brin. He and Google CEO Larry Page have said computer-driven cars may some day eliminate countless traffic injuries and deaths caused by human error, while also saving time, money and land devoted to parking, since they could drop off passengers and return later to pick them up.

Google, which is also testing cars at more remote sites, including a former air base in Merced County, declined to comment in detail this week but said in a brief statement: "As we develop new technologies, we often partner with organizations like NASA Ames who have related interest and expertise."

The tech giant already has ties with NASA: Along with collaborating on other research projects, Google has leased a large section of field to build a big, new office campus. It's also negotiating a separate lease to manage the historic hangars and runways. And some of Google's top executives have a lease to park their personal jets there.

In recent years, Google's [self-driving car](#) project has used retrofitted Lexus and Toyota cars that pilot themselves, using sophisticated sensors, software and onboard computers. Those vehicles, which are a common sight on streets around Mountain View, have steering wheels and other standard controls so technicians in the car can take over driving as needed.

But Google announced this spring that it's developing a new prototype for a self-driving car. The small, bubble-shaped prototype has two seats and an electric motor that can go up to 25 mph, but no manual controls except for "start" and "stop" buttons. It may be impractical to expect

passengers in a self-driving car to remain attentive and ready to intervene in an emergency, Google said in May, so it wants to design a car where that's unnecessary.

California, however, has adopted safety regulations that require even self-driving cars to have manual controls when tested on [public roads](#). Google has said it will install a temporary steering wheel and gas and brake pedals in the new cars to comply with those rules. But the regulations don't apply to roads on federal properties, said Bernard Soriano, deputy director of California's Department of Motor Vehicles. Public access to most of the area is restricted.

Google has already deployed self-driving Lexus vehicles there, in the first stages of its testing agreement with NASA. Those vehicles have been mapping the site and gathering other data that the cars' computers use to steer themselves.

In the next phase, scheduled to begin in the next three to six months, Google will test its new prototype, with a driver on board who can take control if necessary, Feng said in a statement. A month or two after that, she added, Google could begin testing the prototypes "in a more autonomous mode without a safety driver on-board."

Some NASA employees, while applauding the project's goals, raised concerns last month about potential hazards to people who walk or drive on the grounds. But since then, said Leland Stone, president of the Ames Federal Employees Union, managers have given assurances that Google and NASA will make sure the tests are conducted safely.

"One of the goals of this partnership is to make the breakthrough from the current level of partial automation with backup human drivers to true automation," said Stone. "This ambitious goal raised novel safety challenges that needed to be addressed. The union is confident that the

safeguards now being put in place will resolve our initial concerns."

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