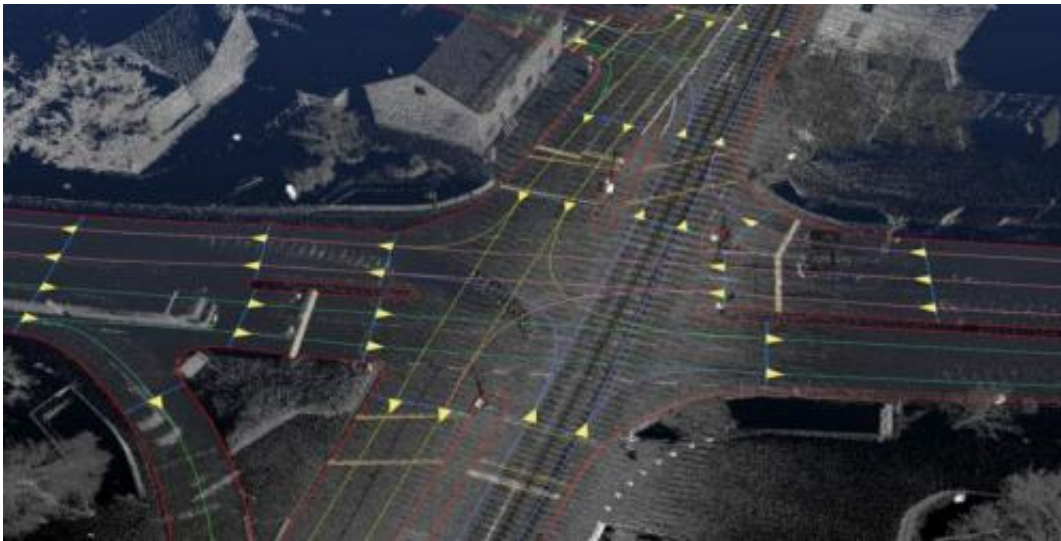


Nokia HERE prepares maps for autonomous cars

December 17 2014, by Nancy Owano



Credit: Wired/Nokia HERE

Autonomous cars will need a new kind of map, a crucial element that until now has been given a back seat to the more popularly discussed issues of sensors and legal questions. Senior Writer Greg Miller in *Wired* put maps back into the car-of-the-future perspective this week.

Autonomous cars, he said, will require maps that differ in several important ways from the maps that automobile drivers depend on today for directions. They need to be high-definition, he said, as "autonomous cars will need maps that can tell them where the curb is within a few centimeters." They will need to be live, with second by second updates on accidents, traffic snarls and closed lanes. They will need to take

human psychology into account and win the trust of their passengers. Nokia HERE, which is the maps division of the company, is making efforts to build high-definition maps for autonomous vehicles. HD maps will tell an autonomous car what to expect along its route.

IEEE Spectrum reviewed the process: To build its digital maps, HERE starts with satellite and [aerial](#) imagery and incorporates "probe data" collected by trucking companies and other fleet operators whose vehicles contain GPS devices. This is anonymized data from the GPS devices, said Miller in *Wired*, and it collects at a rate of 100 billion points per month. As such, it allows engineers at HERE's Berkeley, California, control center to populate the maps upon which its fleet relies with up-to-the-second traffic information. In addition to the probe data are details provided by HERE's own fleet—nearly 200 cars equipped with GPS, cameras, and lidar, said *IEEE Spectrum*.

The lidar system is described in *Wired* as "a cylinder about the size of a soda [can](#)" which "spins around, shooting out 32 laser beams and analyzing the light that bounces back." John Ristevski, HERE's head of reality capture, said it collects 700,000 points per second. The lidar instrument's range tops out about 10 to 15 stories above the street; at street level, resolution is just a few centimeters, said Miller. This fleet is coordinated from a building near the university of California, Berkeley. The sensors on the cars were developed by Ristevski.

About 200 cars have the sensor system that Ristevski designed, Miller reported, and the company has a similar number of cars with an older generation of equipment. To tell the story firsthand of its ongoing mapping plan for self-driving cars, Nokia HERE gave *Wired* reporters a look at their mission-control headquarters and a ride in one of the fleet's [autonomous vehicles](#). Miller saw the sweep of their effort, where "green tags indicated cars actively mapping roads on the west coast and a couple tags indicated that drivers in Australia were off to an early start. The tags

in Europe and the east coast were grayed out, done driving for the day."

Writing about Nokia's mapping aspirations, Chris Davies, executive editor of SlashGear, said last month that "Nokia's HERE team is working toward a self-healing mapping system for autonomous cars, tackling the thorny issue of rapidly out-of-date navigation data by giving self-driving vehicles the intelligence to cook up their own HD maps."

With the challenges of a constantly evolving road network, HERE's ambition involves a [fleet](#) of smart cars as key to keeping the data clean. Davies explained that HERE has its own maps project, increasing the resolution and detail in its mapping by using accurate sensors mounted on top of a team of cars, and gathering data such as lane markings, curb height and more.

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Citation: Nokia HERE prepares maps for autonomous cars (2014, December 17) retrieved 3 April 2024 from <https://techxplore.com/news/2014-12-nokia-autonomous-cars.html>

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