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## **Flying Cars**

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Tokyo, Japan – Electric drones booked through smartphones pick people up from office rooftops, shortening travel time by hours, reducing the need for parking and clearing smog from the air. This vision of the future is driving the Japanese government's "flying car" project.

For now, nobody believes people are going to be zipping around in flying cars any time soon. Many hurdles remain, such as battery life, the need for regulations and of course safety concerns. But dozens such projects are popping up around the world.

A flying car is defined as aircraft that's electric, or hybrid electric, with driverless capabilities, that can land and takeoff vertically, according to Ebihara.

They are often called EVTol, which stands for "electric vertical takeoff and landing" aircraft. All the flying car concepts, which are like drones big enough to hold humans, promise to be better than helicopters, which are expensive to maintain, noisy to fly and require trained pilots, Ebihara and other proponents say [1].

Nissan Motor Co. and Honda Motor Co. said they had nothing to say about flying cars, but Toyota Motor Corp. recently invested \$500 million in working with Uber on self-driving technology for the ride-hailing service. Toyota group companies have also invested 42.5 million yen (\$375,000) in a Japanese startup, Cartivator, that is working on a flying car.

The hope is to fly up and light the torch at the 2020 Tokyo Olympics, but it's unclear it will meet that goal: at a demonstration last year the device crashed after it rose to slightly higher than eye level. A video of a more recent demonstration suggests it's now flying more stably, though it's being tested indoors, unmanned and chained so it won't fly away [2].

There are plenty of skeptics

Elon Musk, chief executive of electric car maker Tesla Inc., says even toy drones are noisy and blow a lot of air, which means anything that would be “1,000 times heavier” isn't practical.

“If you want a flying car, just put wheels on a helicopter,” he said in a recent interview with podcast host and comedian Joe Rogan on YouTube. “Your neighbors are not going to be happy if you land a flying car in your backyard or on your rooftop”.

Unlike regular airplanes, with their aerodynamic design and two wings, Uber's “Elevate” structures look like small jets with several propellers on top. The company says it plans flight demonstrations as soon as 2020 and a commercial service by 2023.

Uber's vision calls for using heliports on rooftops, but new multi-floored construction similar to parking lots for cars will likely be needed to accommodate so many more EVTol aircraft, once the service takes off.

Unmanned drones are legal in Japan, the U.S. and other countries, but there are restrictions on where they can be flown and requirements for getting approval in advance. In Japan, drone flyers can be licensed if they take classes. There is no requirement like drivers licenses for cars.

Uber said at a recent presentation in Tokyo that it envisions a route between the city's two international airports, among others. Savings in time would add up, it said.

“This is not a rich person's toy. This is a mass market solution”, said Adam Warmoth, product manager at Uber Elevate [3].

Concepts for flying cars vary greatly. Some resemble vehicles with several propellers on top while others look more like a boat with a seat over the propellers.

Just as the automobile vanquished horse-drawn carriages, moving short-distance transport into the air could in theory bring a sea change in how people live, Ebihara said, pointing to the sky outside the ministry building to stress how empty it was compared to the streets below.

Flying also has the allure of a bird's eye view, the stuff of drone videos increasingly used in filmmaking, tourism promotion and journalism.

Atsushi Taguchi, a “drone grapher”, as specialists in drone video are called, expects test flights can be carried out even if flying cars won't become a reality for years since the basic technology for stable flying already exists with recent advances in sensors, robotics and digital cameras.

A growing labor shortage in deliveries in Japan is adding to the pressures to realize such technology, though there are risks, said Taguchi, who teaches at the Tokyo film school Digital Hollywood.

The propellers on commercially sold drones today are dangerous, and some of his students have lost fingers with improper flying. The bigger propellers needed for vertical flight would increase the hazards and might need to be covered.

The devices might need parachutes to soften crash landings, or might have to explode into small bits to ensure pieces hitting the ground would be smaller.

“I think one of the biggest hurdles is safety”, said Taguchi. “And anything that flies will by definition crash”.

Flying cars that can zoom over congested roads are closer to reality than many people think. Startups around the world are pursuing small aircraft, which until recently existed only in the realm of science fiction.

Japan wants to take a lead in writing the rules for the nascent industry because policymakers think the current aviation regulations are mostly set by [2].

#### References:

1. Japan drives forward with plans for flying cars [Electronic resource]. – Mode of access: <https://www.cbsnews.com/news/japan-hopes-flying-car-plans-will-make-vertical-takeoff-by-end-of-the-year/>. – Date of access: 16.03.2019.
2. Japan aims high to have flying cars hit [Electronic resource]. – Mode of access: <https://mainichi.jp/english/articles/20180825/p2a/00m/0na/009000c>. – Date of access: 21.03.2019.
3. Japan joins race to make flying cars [Electronic resource]. – Mode of access: <https://www.japantimes.co.jp/news/2018/08/25/business/sky-limit-japan-form-public-private-panel-flying-cars/#.XIgKHiMudPZ>. – Date of access: 03.04.2019.