Possibility or pipe dream: How close are we to seeing flying cars?

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A glossy high rise in the heart of Miami aims to be the first residential building in the U.S. with a specially designed rooftop to accommodate a Jetsons-like future where cars take to the skies.

Halfway through the construction of Paramount Miami World Center, developers determined that the $600 million, 60-story complex needed something extra to stand out among the vast array of living options for the super-rich.

So they installed an observation deck at the top that doubles as a landing pad for vertical takeoff and landing vehicles, often called VTOLs, or flying cars.

The tower will have its grand opening early in 2020. Meanwhile, a flying car's reality, where passengers can be dropped off at home like Amazon drone packages, could be decades away—if ever.

The auto industry, aviation giants and an ever-evolving list of startups are increasingly entering the race toward producing consumer-ready flying cars and air taxis, many of which are touted as fully electric.

Porsche and Boeing estimate that commercial passenger drones will hit the market around 2025, and several concept models are supposedly ready for takeoff as early as next year.

On the surface, there are so many groundbreaking visions being announced and innovations happening that it's easy to forget that the world hasn't even seen a fully autonomous car yet, let alone an electric, multirotor flying vehicle you can park in your driveway.

In fact, there are several hurdles that have yet to be overcome before commuters are whizzing through the air.

For one, drivable aircraft would require batteries that aren't ready. Then there are the legislative and infrastructure hurdles that could take a decade or longer to clear. Lastly, it's not entirely clear that people would feel comfortable with next-level vehicles floating around their

neighborhoods, drifting above their heads or fluttering around their homes.

"What we see today is a whole pile of concepts that aren't necessary solutions," said Mark Jennings-Bates, vice president at the flying cars startup PAL-V. The name stands for Personal Air Landing Vehicle. "They are short on technology. The tech doesn't exist in most instances, and they are short on regulation."

Half-baked batteries

More than a dozen companies are working on air taxi services as a launching point for flying car ideas. These commercial vehicles would serve as a marriage between traditional ride-hailing services and drone-like aircraft that can carry multiple passengers at once.

Uber, one of the world's highest-valued startups, and Boeing, a leader in aviation, have announced ambitious plans and 2023 projection dates for revolutionary air taxis. However, the types of vehicles the companies have in mind would require magical electric batteries that don't exist—yet.

"The best the industry has seen so far with an electric drone vehicle is a projection that it can fly for 20 minutes," said Jennings-Bates. "That makes it an unusable aircraft because it must have a half-hour spare capacity. We have some great prospects out there, but we have to follow that up with technological advancements before we can really offer a timeline."

Uber hired one of Tesla's leading battery experts in 2018 to overcome the battery technology hurdle, as the EV company's cars house some of the best electric batteries out there.

The Model S, for example, has an EPA-rated range of 265 miles on one charge. Still, that battery would have to be much larger to power a flying car holding multiple passengers, and it would have to be much lighter to get off the ground with ease, experts said.

Uber isn't developing flying cars in-house, however, it's catalyzing on an ever-expanding industry that seeks to be the answer to the fantasies of urban commuters. The ride-hailing company has partnered with various aircraft startups and is aiming to pilot a program in Dallas in the next several months.

"The best-in-class stuff from the big high-quality manufacturers are barely good enough to make these (air taxis) feasible in the urban, semi-urban type of network that we've sketched out, "said Eric Allison, head of Uber's Elevate division.

The ride-hailing company put out requirements for aircraft design partners, saying that concepts should include a certain range, speed, payload, operating costs and noise targets to be considered. Targets are 60 miles of max range along with the mandated reserve on top of that.

"As battery tech continues to improve, albeit slowly, it opens up more possibilities," Allison said. " But I'm pretty bullish on several of our partners getting to the finish line by 2023."

Boeing announced that it successfully completed the first test flight of its autonomous air vehicle in January. The flight lasted under a minute.

Dallas-Fort Worth, Dubai and Singapore were among the markets most likely to be early adopters of flying cars, according to a 2018 study by Porsche. The study suggested that electric flying cars could be a $32-billion industry by 2035.

Dubai is already leading the wave, with police operating lightweight motorbikes that can fly for 10 to 25 minutes with one pilot, depending on weight and weather conditions. The hoverbike met U.S. Federal Aviation Administration guidelines in 2018, so it can operate as a personal drone for recreational activity.

Legislation

Since there are no certified actual flying cars yet, regulations surrounding operating them don't exist and the infrastructure to support the ideas doesn't either in most cases.

Companies like PAL-V hope to use existing roadways or expanded highways for their projects, while startups like ASKA are developing flying cars that can land and take off from regular parking spaces.

"Electric vehicles have limited time for hovering, so every aircraft needs to be able to land somewhere efficiently like a nearby Costco parking lot," said Guy Kaplinsky, one of the founders of ASKA, which aims to have a flying car in the air by 2025.

Several others are working within the FAA and National Highway Traffic Safety Administration (NHTSA) guidelines in the hopes of launching new products into the skies in the coming years.

The sector got some breathing room in 2016 after the FAA gave Terrafugia's flying Transition an exemption, allowing it to be certified as a light-sport aircraft. The green light put the flying car on track to become the first in the U.S.

The aviation administration offers strict guidelines for companies seeking to gain compliance for light-sport aircraft. For instance, the aircraft should be under a certain weight, seat no more than two people,

house a single-engine and abide by speed limitations.

PAL-V, which is featured in marketing materials for the building in Miami, requires that operators be licensed pilots to control its flying car that's set to be sold within the next two years, the company said.

PAL-V is currently training pilots and has sold most of its first run of 25 units in the U.S.

Terrafugia says its first flying car is slated for production before the end of the year and it claims to comply with the NHTSA.

Uber's Elevate concept would see passengers dropped off to the nearest "vertical air tower" or futuristic skyports the world has never seen. Though the massive freeway ramps would need to overcome noise challenges and be designed to have little impact on surrounding neighborhoods.

Uber currently operates Copter in New York City under existing helicopter infrastructure and routes.

Are flying cars even necessary?

Whether the United States actually needs flying cars remains relatively ambiguous.

Allison at Uber said, "the world needs a diverse set of ways to weave together modes" of transportation, which suggests that flying cars are more convenience-related than truly life-changing.

Aviation experts say that air vehicles help solve congestion problems in big cities, while others argue that putting traffic in the skies doesn't solve very much.

"Today, we have a lot of traffic congestion on the roadways. San Francisco has the Bay Bridge and Los Angeles is so packed going from Santa Monica to downtown LA," said Laurie Garrow, associate director for the Center for Urban and Regional Air Mobility at Georgia Tech. "Air taxis would provide a solution for bypassing the pinch points."

PAL-V is being marketed for recreational use as an aircraft that can also be driven on the road, rather than as a car that can fly to avoid congestion. "We aren't going to change the world in terms of traffic with flying cars," said Jennings-Bates. "At best, it may displace traffic in the area, which is arguably less pleasant."

It also remains unclear whether consumers feel comfortable with taking wing-stowing vehicles or mosquito-like machines from point A to point B.

Georgia Tech and NASA ran surveys that found some people with long, stressful commutes are "excited about the concept," Garrow said. Though, "there's a difference between how appealing people find it versus whether they would actually use it."

Uber conducted market studies to determine which areas are most likely to benefit from a new mode of transportation. A large helipad in Dallas will help the company better understand public interest when Uber launches aerial ride-hailing in 2023.

Possibility or pipe dream?

With estimated timelines for flying cars getting shorter, and societal intrigue as high as its ever been, some experts say it's not a question of if VTOLs will take off. It's a question of how soon the concepts would be safe enough for humans to occupy.

"There's still a difference between demonstration and certification," Garrow, from Georgia Tech said. " Everyone is very excited and they're coming up with very different designs. You have a lengthy certification process that will need to go through to make sure the craft and flights are safe."

She estimates that it'll be about 20 years before the U.S. sees more than test flights, and the tower in Downtown Miami will be waiting.

"When you see these VTOLs...being purchased or created by major companies across the country, and you see Uber wanting to eventually roll this out across their transportation structure, you start to listen," said Dan Kodsi, the building's developer.

"It won't be much different from people driving up to the front lobby. But instead of dropping off in the front lobby I'm going to get dropped off on the roof in my Uber VTOL."

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