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Is the Future of Aerial Autonomy Up in the Air?

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Autonomous vehicle technology literally has nowhere to go but up. At CES '19, more than 170 exhibitors showed aerial drones of various shapes and sizes. Potential use cases for these devices appear to be limitless, but technical, legal and regulatory hurdles must first be overcome.

Drones are categorized by vehicle weight. The small devices weighing between 0.55 and 55 pounds (.25 kg to 25 kg) are known as Unmanned Aircraft Systems (UAS) and are lightly regulated. Drones exceeding 55 lb are regulated as traditional aircraft. Operators must obtain proper registration, licenses and certification for airworthiness.

Drones have a foothold in today's aerial-vehicle marketplace—but air taxis are not far behind. One of the most impressive CES displays was the Bell Nexus, an air taxi concept that is claimed to be capable of carrying five passengers up to 150 miles, at speeds up to 150 mph (241 km/h). Initially designed to have a human pilot, the Nexus is an eVTOL—hybrid-electric vertical take-off and landing craft. It employs a single gas turbine to generate electricity for six tilting ducted fans and their batteries.

Bell is aiming for $0.50-per-mile operating costs for Nexus. It is partnering with Uber to create a network of city-based flying taxis as a ride sharing service. At least 19 companies are developing similar products. Many are approaching the "on-demand aviation" market with eVTOL or conventional VTOL solutions to minimize problems in crowded cities. However, making VTOL a reality will require additional infrastructure and air-traffic control. Some facility options include vertiports (hubs with the ability to take off, land and charge) and vertistops (a single landing pad) that require only discrete locations rather than converting an entire roadway or traffic system.

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