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Japan Is Getting Serious About Flying Cars

The country's once-envied government skunk works has set its sights on speeding up the arrival of aerial taxis and trucks.



ILLUSTRATION: KHYLIN WOODROW FOR BLOOMBERG BUSINESSWEEK

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Japan often appears stuck in yesterday's vision of tomorrow. Flip phones are common enough that they're cited as the exemplar of a phenomenon called Galapagos Syndrome, referring to the country's tendency to stick with technologies endemic only to its islands. Another anachronism, Yahoo, remains wildly popular. Tokyo of the 1980s may have inspired the futuristic cityscape of Blade Runner, complete with flying cars, but the fax machines that were cutting-edge when the film came out remain ubiquitous tools today.

Ensuring Japan doesn't fall behind the technological curve has for decades been the job of the Ministry of Economy, Trade, and Industry, a powerful agency housed in a squat modern office block in Tokyo's orderly government quarter, a few blocks south of the jagged moat surrounding the Imperial Palace. The building is orthogonal in every respect, a uniform stack of concrete threaded with long, featureless corridors. The bureaucrats here guided Japan's postwar economic miracle, a boom that gave the world

the transistor radio, the Walkman, and the Prius—and almost no transformative innovations since. None of the automakers championed by METI are today on the leading edge of robotic driving. For the most part, Japan’s faded tech companies can’t lay claim to either smartphone or internet greatness.

Not long ago, 33-year-old Fumiaki Ebihara began worrying from his desk inside METI that Japan risked being wedded to another antiquated practice: traveling on solid ground. The flying-car future is coming, he wagered, and Japan could realistically figure it out first. He’s since put himself at the center of what might be the world’s most comprehensive government effort to understand and encourage flying cars—defined as electric-powered vertical takeoff and landing vehicles that will ultimately be largely or fully autonomous—as a way to revamp everyday mobility. This effort has so far produced a national road map for flying-car development embraced by industry leaders and set up a government structure to define and advance regulations. If all goes well, Ebihara believes the skies of Tokyo could be traversed with aerial taxis and delivery trucks by the late 2020s.

“Compared to other countries, Japan already has many of the strengths we’ll need for flying cars,” Ebihara said in a November interview in a METI conference room. He’s slight, with a thatch of spiky hair, stylishly rounded glasses, and a habit—still unusual for Japanese bureaucrats—of appearing tieless in public. Just behind him was a framed poster depicting a Boeing jet soaring above a Japanese temple, over the slogan “Made with Japan,” a reminder that while the country makes few aircraft of its own, its aerospace industry is a significant provider of components for those assembled elsewhere. “Mass production, materials science, battery technologies, systems integration—we have all the ingredients,” he continued. “This is a big chance for us.”



Fumiaki Ebihara was a midlevel staffer at Japan's Ministry of Economy, Trade, and Industry when he convinced his bosses to embrace flying cars.

PHOTOGRAPHER: SHIHO FUKADA FOR BLOOMBERG BUSINESSWEEK

The members of Japan's small, passionate flying-car community are mostly young, English-speaking, and dismissive of the sclerotic orthodoxies that have kept their country from seizing recent opportunities. They also believe they have a genuine shot to assume global leadership. Prime Minister Shinzo Abe's government, eager to reinvigorate the economy and sell a fresh national image in time for the 2020 Olympic Games in Tokyo, says it's fully behind them.

But its recent record of providing a hospitable environment for disruptive ideas is abysmal, even when political will exists, contributing to lost decades of economic growth. After Japan's decades-long domination of cars, China and the U.S., led by Tesla Inc., have streaked ahead in the biggest shift in the global auto industry: electrification. Local and national regulations in Japan have severely restricted Airbnb Inc.; thanks to ferocious opposition from taxi companies, ride-hailing apps have never arrived in force. Japan's flying-car advocates intend, in less than a decade,

for it to be possible for anyone in Osaka or Sapporo to summon a flying Uber at the tap of a smartphone. Yet today it's difficult even to hail one on wheels.

At the time he began conceiving of the flying-car initiative in 2017, Ebihara was an unknown midlevel METI staffer with responsibility for liaising with aircraft manufacturers. In one of those discussions, what he'll describe only as "a large aerospace company" briefed him on its plans to develop an airborne taxi and wanted to know about Japan's policies. He was befuddled; for the most part, Japan didn't have any.

In fairness, relatively few government agencies anywhere have begun coming to grips with what it will take to regulate flying cars. While Dubai, Singapore, and New Zealand have expressed similar intentions to be first movers—the latter entering a partnership with Google co-founder Larry Page's Kitty Hawk Corp.—larger countries with more complex airspace are moving gradually. The U.S. Federal Aviation Administration told attendees at a flying-car summit convened in May by Uber Technologies Inc. that they may need to lower their expectations for the speed at which regulators will greenlight the vehicles. The same agency still hasn't finalized rules that would allow drone operators to fly at night or above crowds. In the U.K., meanwhile, relatively liberal rules on drones haven't translated into an enthusiasm for stuffing them with people.



Industrial policy set by bureaucrats inside METI's Tokyo headquarters helped spark Japan's postwar economic miracle.
PHOTOGRAPHER: ALAMY

Even at METI, Japanese bureaucrats are a conservative bunch, and flying cars were a hard sell for Ebihara. “At first they didn’t believe it was important,” Ebihara said of his bosses’ attitude toward his new idea. “But they saw the logic eventually.”

Japan might have greater-than-average incentives to move quickly. The country is regularly walloped by earthquakes and typhoons that make passage by road difficult or impossible. It’s extreme in geography, too, with well over 400 inhabited islands and hundreds of hard-to-reach alpine villages. Navigating the congested cities on its four main landmasses by car is difficult: A drive from central Tokyo to the capital’s main international airport, Narita, can take two hours.

The government unveiled its flying-car program last August, with partners that included Boeing Co. and Airbus SE as well as domestic players such as Yamato Holdings Co., Japan’s largest delivery operation, and the carmaker Subaru—known at home not only for sensible station wagons but for its work assembling Apache attack helicopters. Despite its difficulties in

Japan, Uber was also on board, and the government is hopeful that the U.S. company will choose Tokyo as a test bed for its flying-car program, Uber Air. The idea is for these corporate partners to collaborate with bureaucrats on developing a comprehensive plan to safely deploy and regulate flying cars across Japan, with test flights beginning as soon as this year.



A model of Uber Air's electric vertical takeoff and landing jet displayed at an expo hosted by the company in Tokyo last year.
PHOTOGRAPHER: TOMOHIRO OHSUMI/BLOOMBERG

Yet rather awkwardly for an ostensible effort to vault Japan to the forefront of the nascent flying-car industry, almost none of the Japanese participants is building or planning to build flying cars. Many of the relevant innovations will come from foreign companies: Airbus, Uber, and Bell Helicopter are all working on vertical takeoff and landing vehicles suitable for urban environments. Most of Japan's homegrown contenders are aiming at providing some smaller component of a flying-car ecosystem, like batteries, control software, or air traffic services.

There is at least one Japan-made flying-car prototype, and it only recently received permission to leave its warehouse near Nagoya, the nation's traditional aerospace capital. It's a rough version of a planned two-

seater craft, three-and-a-half meters long and just over a meter high, capable of vertical takeoff on four helicopter blades mounted on legs that protrude slightly downward from the fuselage like pontoons. Getting sign-off from Japan's Civil Aviation Bureau for outdoor flights was a laborious process for Cartivator, a collective of Tokyo- and Nagoya-based engineers.



A rendering for a flying car being developed by Cartivator, a volunteer effort that's one of Japan's only homegrown attempts.
SOURCE: CARTIVATOR

“Regulation here is strict and conservative, and Japan does not have a lot of experience building whole aircraft,” co-founder Tsubasa Nakamura said in an early-evening interview at a train station cafe in Tokyo’s western suburbs, as salarymen in their usual matching black suits file past on their way home. “Developing a flying car here is not easy.”

Nakamura started Cartivator in 2012 while working as an engineer at “a major Japanese automotive company” and has been fascinated by the notion of a flying car since seeing *Back to the Future* as a kid. (At one point, he set out to calculate the feasibility of a flying DeLorean.) After trying to develop the concept at his day job, he concluded it was impossible within

the confines of a risk-averse industrial giant and left last year to work on his passion project full time.



Nakamura
PHOTOGRAPHER: SHIHO FUKADA FOR BLOOMBERG BUSINESSWEEK

Cartivator is not a startup. Rather, it's a volunteer organization with more than 100 members who contribute up to 20 hours a week of spare time and receive modest funding from Toyota Motor, Panasonic, and NEC, among others. "Venture capital money in Japan is not so easy to get at the scale you need" for a hardware business, Nakamura said, let alone one in the capital-intensive world of flying machines. "Engineers tend to remain in the big companies, so a volunteer model is an easier way to do it," he added.

But flying cars need to be a business in the end, so Nakamura and a co-founder, Tomohiro Fukuzawa, created a spinoff company, Skydrive, that's raised about \$3 million in venture funding. That's a small fraction of what Nakamura says he'll need to accomplish his medium-term goal: using a flying car to light the Olympic torch at the Tokyo 2020 opening ceremony.



Tsubasa Nakamura, third from left, watches the flight of a test model of the Cartivator flying car in 2017.
PHOTOGRAPHER: KOJI UEDA/AP

Still, it wouldn't be fair to say that Japan's major corporate players are absent from flying-car development. One of the more enthusiastic is Yamato, a century-old logistics. Last year it began a partnership with Bell, a unit of Textron Inc. that builds aircraft including the U.S. military's V-22 Osprey, to roll out futuristic helicopters designed to make deliveries in urban areas.

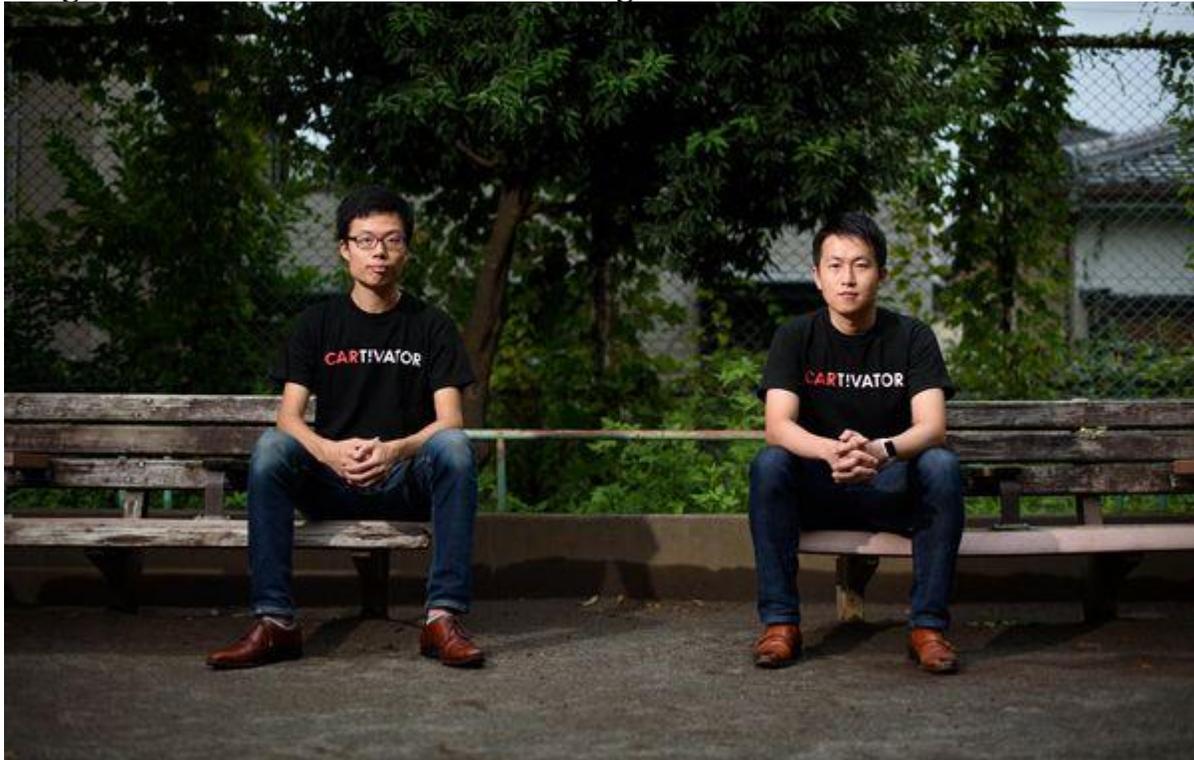
"Yamato must be the leader in this field," executive Shinji Makiura said. "If someone else does it, we're going to be disrupted." The urgency is in part a product of persistent labor shortages that all Japanese companies face as the population shrinks due to low birthrates. "We have to learn to operate with less people," Makiura said.

The company, which delivers some 1.8 billion packages annually, is planning a test flight this year and an entry into service in the mid-2020s. The chief researcher behind the effort is a rail-thin 28-year-old, Yu Ito, who was working as a management trainee when Makiura spotted on his desk a copy of his graduate thesis on the technical feasibility of flying cars. Ito

soon had a team, a budget, and an enthusiastic partner in Bell—a rise that might have taken decades to pull off in a traditional Japanese hierarchy.

“Many of the basic problems”—of scheduling, network management, cost containment, and the like—“are ones we’re familiar with,” Ito said. Then he chuckled: “The challenge is that we’ve never been airborne.”

But even at this most fly-curious of Japanese companies, the flying part is largely up to someone else. In addition to developing an economic model for operating flying trucks, Yamato’s principal role in the Bell collaboration is to develop a modular, air-mobile cargo pod, perhaps with the capability to make the final leg of some deliveries by scooting about autonomously on the ground. The actual aircraft is being left to the Americans.



Cartivator's Nakamura and Tomohiro Fukuzawa, left, founded a spinoff company, Skydrive, that's raised about \$3 million.
PHOTOGRAPHER: AKIO KON/BLOOMBERG

For cars to take flight in Japan, they will have to overcome a force that can be just as fundamental as gravity: other arms of the state bureaucracy. Many agencies beyond METI will have to sign off on a viable plan for mass air mobility, and perhaps the most important is the Ministry of Land,

Infrastructure, Transport, and Tourism. In addition to certifying the safety of proposed new vehicles, it will be responsible for the design and administration of a control system far more complex than those now employed for even the busiest airspace.

The ministry is housed in another hulking Tokyo office block, this one near the Diet, Japan's parliament. To find an official with authority on the future of flight, proceed to a tiny, sweltering meeting room deep inside, past a wastebasket overflowing with cigarette packs and a harshly lit open office where dozens of men in short-sleeved white shirts bang away on laptops, pausing periodically to retrieve faxes. "We cannot compromise on the safety of flying cars—whether the aircraft, the riders, or the people around the vehicle," said Masafumi Ohi, a deputy director in the ministry's Airworthiness Division. As he spoke, small, insistent beads of sweat were forming on the nose of a subordinate who'd joined the meeting. Just behind Ohi's head of flat black hair, someone had left a blue three-hole punch on a metal shelf. "It's not about being unwilling to challenge conventions, but you can't just sacrifice safety in the pursuit of convenience, especially in city centers," he added.

Japan's safety culture is perhaps the most pervasive and uncompromising on the planet. Not for nothing do white-gloved attendants stand sentinel at construction sites, watching intently lest a passing pedestrian trip or stub a toe. Since the horrific crash of a Japan Airlines 747 in 1985, no Japanese carrier has had a fatal accident; in some 50 years of operation, the Shinkansen bullet-train network has never experienced a serious collision or derailment. But it seems inevitable that as flying cars are adopted some will crash, perhaps fatally—a scenario that could sorely test risk-averse Japanese officials' enthusiasm for moving faster than other countries.

The practical obstacles don't stop there. One of the reasons Japan appears ripe for flying-car deployment—the nature of its huge, densely populated cities—cuts both ways. Barring the construction of a vast

archipelago of rooftop garages, it's not clear where thousands of new airborne vehicles would find places to park in such metropolises as Tokyo or Osaka, where almost no space of significant size goes unused. And thanks to decades of government attempts to stimulate the somnolent economy with grand construction projects, those same cities have perhaps the world's finest existing infrastructure, with rail and expressway networks of a complexity that's hard for foreigners to grasp. Flying cars are undoubtedly cool, but perhaps less so when competing with the Shinkansen, a separate planned system of 300-mile-an-hour magnetic levitation trains, and, in Tokyo's case, a rail and subway system so intricate that no single map of all its lines exists.



Kotaro Chiba runs the Drone Fund and has invested in Skydrive and other startups related to flight.
PHOTOGRAPHER: KENTARO TAKAHASHI/BLOOMBERG

Kotaro Chiba might be the most fervent flying-car believer in all of Japan, if not the world. Until three years ago, however, the Tokyo investor was putting his money into more earthbound industries like travel and mobile gaming. Then someone bought him a drone as a gift, and Chiba became

smitten with flight. He now owns more than 30 drones and flies a Piper Cherokee plane that he keeps at an airfield in Nagoya.

His deepest involvement with flying machines is in his day job. Chiba is now the proprietor of the Drone Fund, a \$15 million pool devoted to investing in autonomous aircraft in general and flying-car businesses in particular. Its investments include Skydrive, the startup spun out of Cartivator, as well as a “drone as a service” operation called Clue and a clutch of companies developing software or robotics for advanced aircraft—more than 20 in all.

The Drone Fund is run from an anonymous midrise near the Tokyo Tower, sharing space with Aerial Lab Industries, a startup in which Chiba is the lead investor. The centerpiece of its office is a full-size, matte-black mockup of a “hoverbike”—a motorcycle intended to float a few feet above the road, with the help of a quadruple set of rotating turbines—that ALI is developing. Ten paces or so from there, racks of servers whine faintly at all hours, cooled by oscillating fans: In addition to his airborne pursuits, Chiba is an enthusiastic Bitcoin miner.

Chiba is 44, with salt-and-pepper hair that he wears in a Beatles-style bob. He’s something of an eccentric: Occasionally he turns up at events, including the official kickoff of the government’s flying-car program, wearing a kimono. (For the interview, he wore a button-down shirt with both checked and camouflage patterns, one layered over the other.) The Drone Fund has nonetheless attracted money from much of Japan’s corporate establishment, including units of Mizuho Bank, Daiwa Securities, and the Dentsu advertising empire. Chiba is now trying to raise about \$50 million for a second fund, enough to get some of his projects fully off the ground.

Overall, Chiba’s goal is to invest in a suite of companies that together can build a Japanese flying-car ecosystem. “At first, drones will only carry cargo,” he said, perched on an overstuffed couch between the Bitcoin rig and an elaborate, three-monitor flight simulator set up on an adjacent desk.

“Then if that succeeds, it will be celebrities, executives, the time-is-money people. And then the mass market. If we really get it right, the price will be less than a taxi.” This is a lower bar in Tokyo, where a short cab ride can easily top \$20, than elsewhere.



The Drone Fund's pitch deck features anime-style drawings of Japan's flying-car future.
SOURCE: THE DRONE FUND

And Chiba believes Japan has what it takes to make it happen. “If you look only at drone manufacturing, maybe China is No. 1,” he said. “And if you look at only the software, maybe the U.S. is No. 1. But if you look at integrating it all together in an absolutely safe way, that’s the Japanese strength.” In Chiba’s telling, flying cars represent the ultimate systems integration challenge, an amalgam of engineering, regulation, and network management that Japan can tackle like no one else.

There’s also the pop-culture factor. “We have a lot of futuristic images from childhood,” he said. His investor marketing materials make the subtext into text in the most obvious way imaginable. The Drone Fund’s pitch deck features a series of anime-style illustrations, starring a buxom, doe-eyed schoolgirl who takes advantage of everything a future flying-car economy has to offer: summoning an aerial taxi by smartphone, seeing siblings off on a flying school bus, and observing as flying trucks are loaded

with packages. In another image, the protagonist zips down a Tokyo street, just a few feet off the pavement, suggestively straddling a Drone Fund-branded hoverbike.

At that point in the presentation, Chiba's usual insistence on the practical business case for personal air mobility slipped briefly away. Asked why anyone would buy such a contraption rather than a conventional motorcycle, he replied immediately, and in English, without waiting for his translator: "Just cool!"



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