

 **SKYDRIVE**

空を、走ろう。



Beyond Drive.



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MESSAGE

The history of humankind has undergone major changes every time there has been a breakthrough in modes of transportation, including developments like the invention of steamboats and steam locomotives and the start of mass production of the Ford Model T. Since the dawn of the Industrial Revolution, approximately every 80 years or so such mobility revolutions have brought about significant, critical changes in the range of transportation options for both people and goods, with people experiencing these sweeping transformations over the course of their lifetimes.

Now, we at SkyDrive are trying to realize a world where people can move freely in the air in their daily lives. Based on aircraft, drone, and automobile technology, we are working to create what we call “flying cars,” an air mobility solution that enables traveling in the air on a day-to-day basis. Once this vision has become a reality, you will be able to move from the location of your choice to your specific destination quickly and enjoyably without experiencing any of the stresses associated with current ground transportation options, such as traffic jams, crowded trains, detours, and transfers.

In terms of the technology involved, we are already very close to making this dream come true, but we need the cooperation of a greater number of people in a wider range of areas in order to develop and build a solid product, satisfy all regulatory requirements, including safety standards, and get our solution accepted by society at large.

At SkyDrive, we are moving forward in partnership with central governments and local authorities as well as private businesses around the world in pursuit of our vision. For many years, Japan has been a leader in the manufacturing sphere but we have lagged behind some other countries in term of envisioning and creating hardware startups and we have remained uncompetitive in the aviation industry. However, air mobility in the form of flying cars has similarities to automobiles: the mode of transportation will be used on a daily basis in a casual manner, it will be compact, and it will be mass produced. These characteristics make air mobility an arena in which Japan is well equipped to excel.

Japan is a world leader in manufacturing know-how and organizational capabilities and has particular strengths accumulated over the years in the automobile industry, which positions us to make major contributions to the creation of a global air mobility solution. We have also been witnessing a new trend in Japan over the past several years, whereby startups have been attracting increased interest and more human resources from a greater variety of businesses than ever before in the history of our nation. As such, we at SkyDrive firmly believe that now is the best time to promote a hardware startup industry and revive the aircraft industry in Japan.

In December 2019, we achieved a manned test flight that made SkyDrive one of the world’s leaders among a number of players engaged in flying car projects. We plan to accelerate our efforts now with the aim of developing a flying car for practical use by 2023. At the same time, we will be developing a value-added solution for cargo drones by increasing maximum payload capabilities to contribute to the further automation of cargo transportation.

In a world with SkyDrive, people will be able to get a ride to anywhere in the 23 wards of central Tokyo in less than 10 minutes. You will book with your smartphone, a flying car will automatically land at the spot you specify, such as

in front of your apartment building, your office building, or your house, and then it will take you to your destination and leave you there while it takes off to get its next passenger. We are confident that SkyDrive will turn this vision, which for most people is just the stuff of science fiction novels or movies, into reality.

Japan's first flying cars will add more fun and more freedom to mobility. We look forward to your support in this endeavor to open a new era that offers safe, secure, and comfortable air mobility.

CEO

Tomohiro FUKUZAWA

CORPORATE LOGO



It expresses SkyDrive's desire to achieve a safe, secure, and comfortable world of air mobility. The emblem of the symbol is constructed in the form of a rotor with the image of the SkyDrive's "S" spinning in the sky and starting to drive. In addition, we have added strong and weak elements to show that it is important to keep moving towards the future and that SkyDrive continues to move forward to realize its business.

Company Overview

Company name: SkyDrive Inc.

CEO: Tomohiro Fukuzawa

Establishment: July / 2018

Business: Development, manufacturing, sales and service of Urban air mobility / Cargo drone

Address: Tokyo, Japan

Member: 50

Tomohiro FUKUZAWA, CEO

Mr. Fukuzawa has had a long career in the automotive industry. Upon graduating from the University of Tokyo, he went to work for Toyota Motor Corporation, where he was engaged in global procurement and introduced and promoted kaizen activities based on Toyota's production methods at various manufacturing sites. He subsequently worked as an independent consultant drawing on his experience at Toyota. In 2014 he joined CARTIVATOR, a group of engineers, technicians, and others who were volunteering their time and expertise to make the dream of flying cars a reality. In 2018, based on the progress made by CARTIVATOR and his perception that demand for the practical application of flying cars was growing, he spearheaded the foundation of SkyDrive Inc. He is actively participating in the formulation of the new rules and regulations needed for the realization of flying cars as essential urban infrastructure as a member of the Public-Private Conference for Future Air Mobility Revolution established by Japan's Ministry of Economy, Trade, and Industry and Ministry of Land, Infrastructure, Transport, and Tourism.



MEMBER



Tomohiro FUKUZAWA
CEO
 Graduated from Tokyo University. Worked at Toyota Motor Co. for global procurement of automotive parts. Established SkyDrive Inc. in 2018 and become CEO.



Nobuo KISHI
Chief Technology Officer
 37 years working for Mitsubishi Heavy Industries and Mitsubishi Aircraft Corporation. EX Senior Executive VP of Mitsubishi Aircraft Corporation.



Toshio Ando
Chief Engineer, Urban Air Mobility, Manned Flight
 Produced & flown RC amphibious airplanes for 40 years and designed, built and tested more than 30 original drones.



Toshio NARIMATSU
Cargo Drone General Manager
 30 years Working at manufacturing industry as a sales staff and an engineer.



Takuya NEMOTO
Chief Engineer, Cargo Drone
 Studied drone technology development at Chiba University. Ex worker at Toyota Toyota Motor Co.



Ph.Dr. Mark BLACKWELL
R&D strategy senior manager
 Graduated from the University of Southampton. Worked for BAE Systems and Eaton Aerospace, before working in Japan on the MRJ project.



Hiromi GO
Finance senior manager
 Graduated from Bates College with BA in Economics. Served as equity analyst at multiple investment banks and venture capitalist.



Mitsuhsa KATO
Advisor
 Joined Toyota Motor Co. in 1975. Took office as Executive Vice President and Director in 2012. Took office as CEO of Toyota central R&D labs., Inc. in 2016.



Hisashi MATSUMOTO
Advisor
 Professor at the Nippon Medical School. After graduation from Kanazawa university, he become a Gastroenterological surgeon then emergency physician from 2000. A pioneer of Helicopter emergency medical services (doctor-helicopters).

LOCATION

Tokyo Office	3-8 Okubo, Shinjuku-ku, Tokyo
Toyota R&D center	2-1-1, koromo-Cho, Toyota-Shi, Aichi, Monodukuri creative base SENTAN
Toyota test field	Aichi Pref.
Fukushima development base	Fukushima Pref.

Toyota R&D center and Toyota Test field are over 10,000 m² zone



HISTORY

CARTIVATOR



2050.XX Everybody fly in the sky in this era



It all started with CARTIVATOR, a group of about 100 volunteers, who in 2014 started development of an urban air mobility concept with the aim of conducting a demo flight in the summer of 2020. With the support of approximately 100 sponsor companies who shared our vision of the future, we have advanced our development.

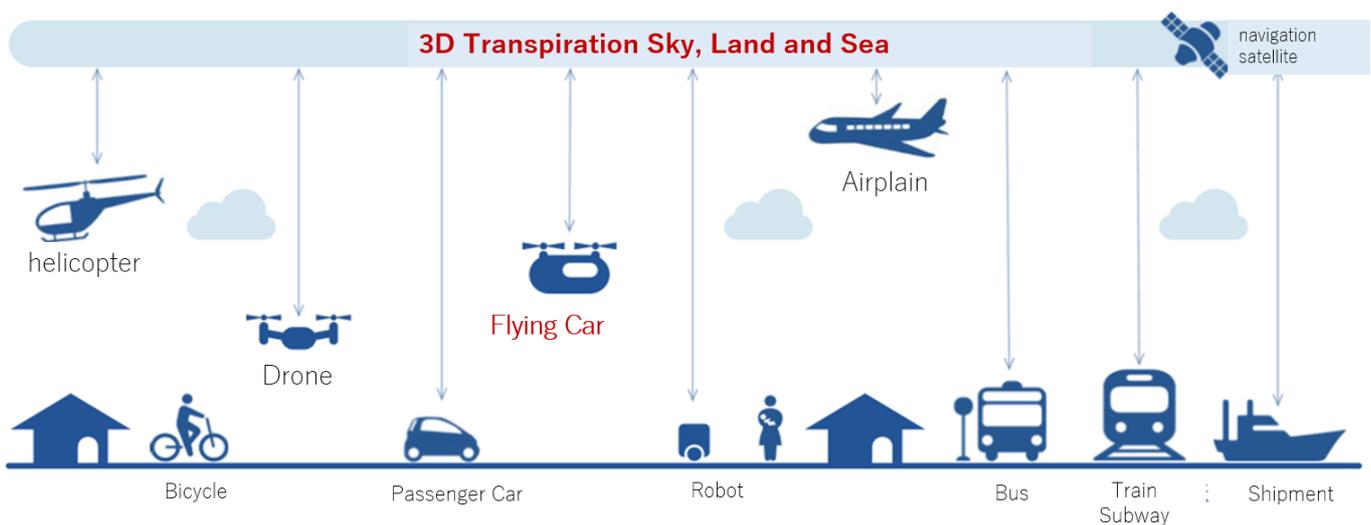
Then, more recently, as market needs for the technology has increased to the point that the government formed a public-private council, Fukuzawa, a joint representative of the volunteer group CARTIVATOR, founded SkyDrive Inc. in July 2018 to commercialize the technology.

Tapping into technology nurtured through the aircraft development process, SkyDrive is also advancing the development of the Cargo Drone, an industrial drone that specializes in the transportation of heavy objects. A proof of concept experiment started in November 2019. Flying car did a demonstration flight in the summer of 2020 and to be available for sale in 2023. The Cargo Drone is starting to sales in May 2020.

WHAT IS FLYING CAR?

The Public-Private Council for Air Transportation Revolution, a council that was founded in 2018 and whose secretariat is the Manufacturing Industries Bureau, Ministry of Economy, Trade and Industry (METI), and the Japanese Civil Aviation Bureau (JCAB), Ministry of Land, Infrastructure, Transport and Tourism (MLITT), defines flying car, our flying car, as an aircraft that is equipped with the following three functions.

Electrification	Requires fewer parts than an engine-powered aircraft, which means reduced maintenance cost and less noise.
Automated operation	Unlike conventional aircraft, a flying car requires no pilot so it can be readily operated by anyone.
Vertical takeoff/landing	A flying car requires no runway or paved road, which means takeoff/landing requires minimal infrastructure and it can provide improved freedom in mobility.

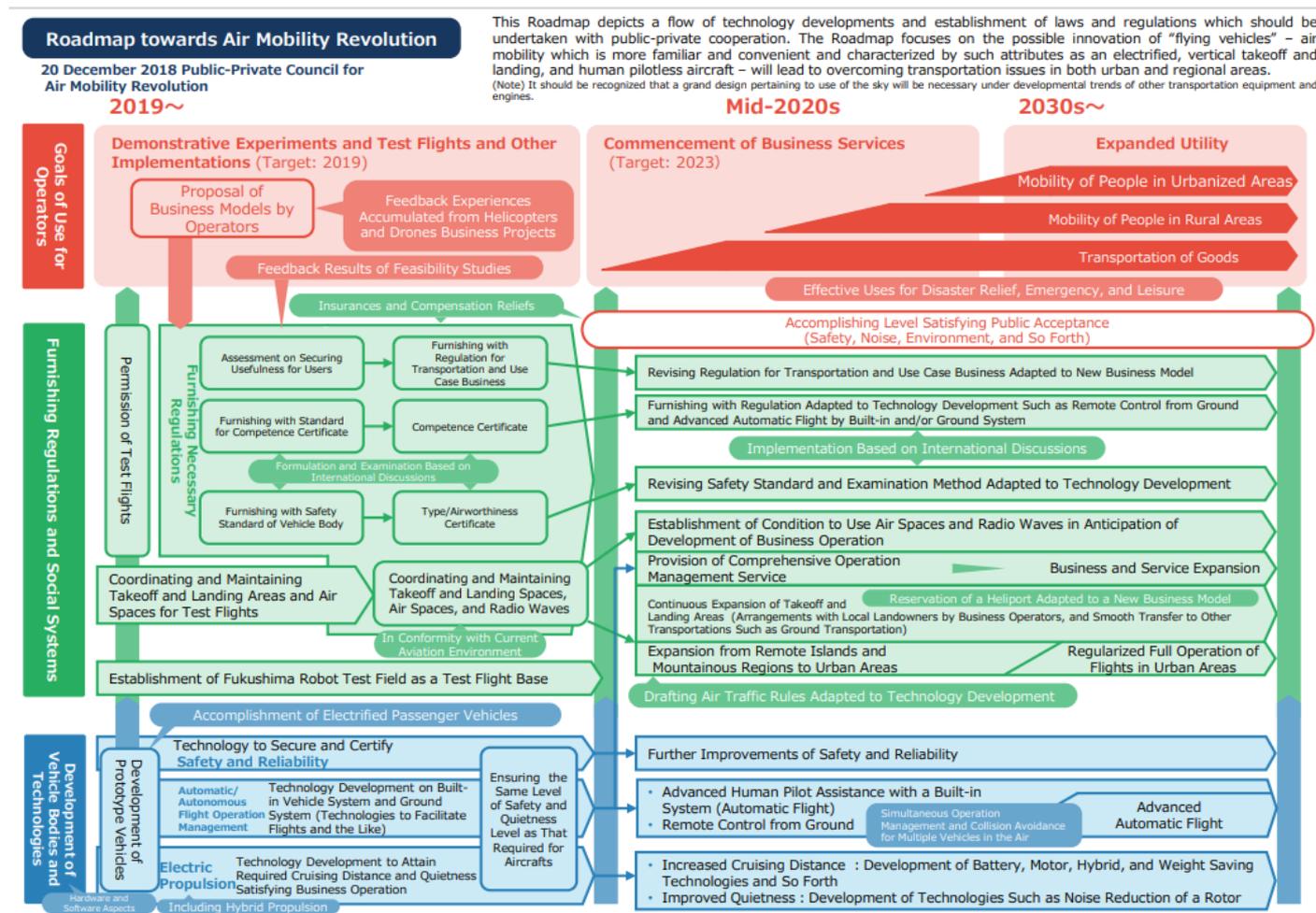


USP	Electronic	Automation	Vertical Take Off and Landing
Benefit	Low Cost Reduced Noise	Easy to drive Less Pilot Requirement	Transportation from Point to Point by using Less Infrastructure

In 2018, the Ministry of Economy, Trade and Industry and the Ministry of Land, Infrastructure, Transport and Tourism launched the Public-Private Council for Air Transportation Revolution, convening members of the government and public, to bring to fruition the flying car in Japan. The council also laid out a road map towards “air transportation revolution.”

In 2019, the Cabinet Office also included as its growth strategy the commercialization of flying cars in 2023.

As a leading private-sector company, SkyDrive has joined this Council to develop its business and technology through public-private sector collaboration based on the set time schedule.



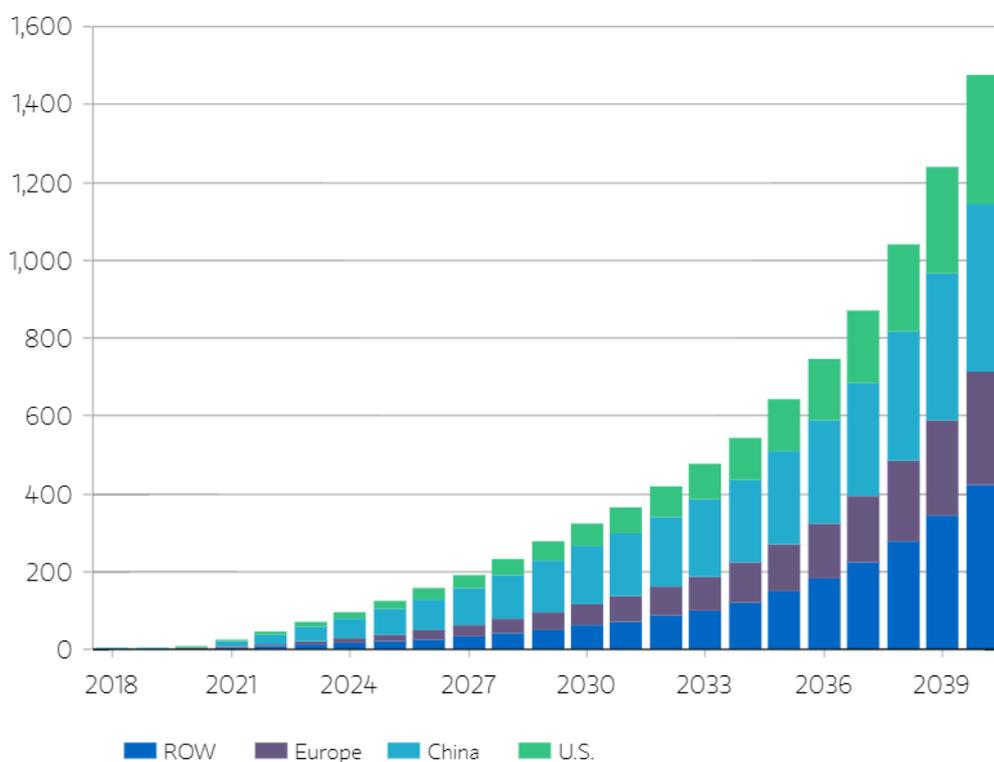
Source: METI Ministry of Economy, Trade and Industry

Urban Air Mobility MARKET FORECAST

Development of e-VTOLs (electric vertical takeoff and landing)) and flying cars is being advanced around the world. After some 100 years have passed since automobiles and aircraft first came into practical use, now is said to be the revolution in mobility that comes only once in a hundred years.

According to Morgan Stanley Research, the urban air mobility market is expected to reach 170 trillion yen by around 2040, raising expectations for wide spread use around the world.

Besides developing the first flying car in Japan for the global market, it will launch in May 2020 the sale of an industrial drone specifically for transporting heavy cargo to promote mobility revolution in Japan.



Source : Morgan Stanley Research

FLYING CAR: SD-XX MANNED FLIGHT MODEL

SD-XX

Sales release in 2023

SkyDrive concept model



Basic specifications

	length	width	height
Size	4.0m	3.5m	1.5m
Persons			2
Fuel	Battery (electric)		
Propeller	8 total (x1 co-axial pair per quadrant)		

Flight specifications

Maximum take-off weight	500kg
Cruise speed	100km/h
Duration	20~30minutes
Flight altitude	~500m

Ground Drive Specification

Top speed	60km/h
Range	20~30km

Two-seater SkyDrive concept model

- Smooth transition between "drive" and "fly"
- Vertical take-off and landing
- Compact size equivalent to automobiles
- Safe and secure
- Electrically powered

*Sales release dependant on social implementation operational performance/results.

The flight unit uses coaxial rotors to minimize the vehicle footprint, which means less space required for take-off/landing and will enable ground driving. Six to eight single rotors would be required to fly an aircraft of 400 kg with a drive system. By employing four sets of coaxial rotors, one in each corner, we aim to develop one of the smallest flying cars in the world that can generate ample lift.

"SD" in the name of the aircraft is an acronym for SkyDrive and the following number is the development series number. Hence, the concept model is named "SD-XX."

CARGO DRONE

Cargo Drone

NOW on Sales

A cargo drone service for transportation of heavy materials in various industries



Standard technical specification:

	length	width	height
	1.3m	1.7m	1.0m
Empty Weight :			25 kg
Payload :	30kg (Recommended baseline)		
Flight speed :			40 km/h
Flight time :			15min



Material transportation during tower maintenance or steel tower repair



Material transportation between civil engineering and construction sites



Transportation of heavy agriculture equipment



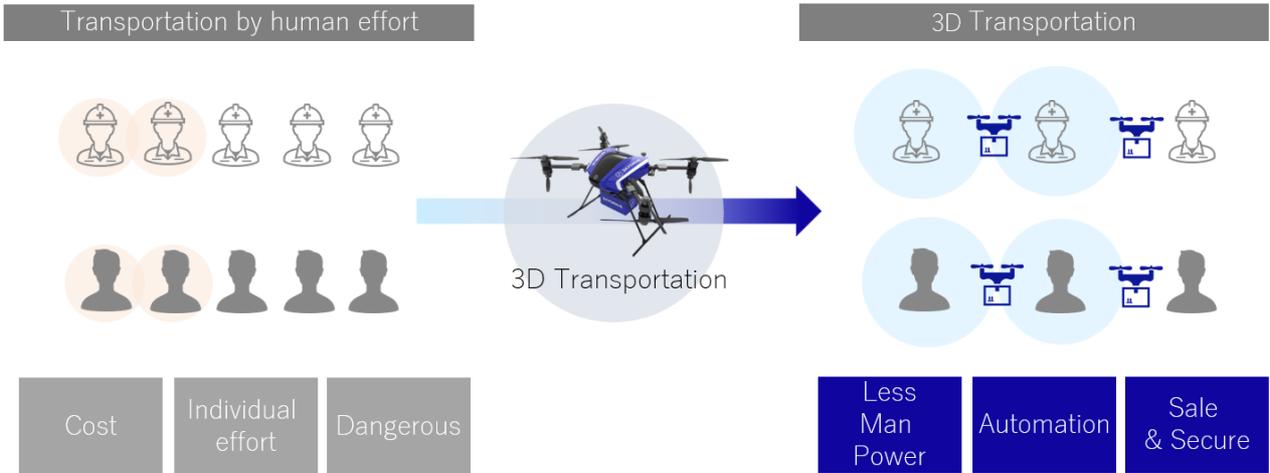
Emergency transportation during disasters

Ensure high levels of operational and vehicle safety by implementing aircraft development standards and processes

SkyDrive Cargo Drone Standard Model

- Heavy materials transportation over 30kg
- Ensure high level of operational and vehicle safety by implementing aircraft development standards and process
- Automatic air transportation with take-off and landing location at different heights
- Equipped with an automatic lifting function without landing

CARGO DRONE USE CASE



December 2019: Feasibility study at construction site with Obayashi Corporation

August 2020: Delivery service study in Kobe city with Seino Holdings Co., Ltd., Kobe Hankyu, TrueBizon, Ltd., and Seiwa Pharmaceutical Co.Ltd..



PROGRESS OF AIRCRAFT DEVELOPMENT

The fuselage of flying car is enlarged so it can accommodate two passengers and be driven as an electric vehicle on the ground. In drive mode, SkyDrive is driven on tires, and in flight mode, the fenders in the four corners will transform to allow the rotors to propel SkyDrive into flight. We are aiming to develop one of the smallest flying car in the world that can take off from an ordinary road.

SD-01 ~2018

Basic Specifications	<ul style="list-style-type: none"> • Overall length x overall width x overall height: 3,700 mm x 3,700 mm x 1,500 mm
Intended for unmanned flight	<ul style="list-style-type: none"> • Target maximum flying speed: 100 km/h • Target maximum driving speed: 50 km/h • Target maximum altitude: 10 m • Maximum take-off weight: 400 kg • Fuel: Electric Battery
Drive unit	<ul style="list-style-type: none"> • Reverse trike platform with two wheels in front and one wheel in rear • Neutral steering characteristics due to front-rear weight distribution that is nearly 50:50 and sprung weight on par with sports cars enable nimble driving performance. • Damping function absorbs energy upon landing. • Lightweight drive unit realized with an in-wheel motor that drives the single rear wheel.
Flight unit	<ul style="list-style-type: none"> • Compact high thrust unit and coaxial rotors are used to aim for the smallest urban air mobility in the world. At the same time, redundancy design ensures high reliability. • Thrust is vastly improved compared to rotors of the same size by employing ducted rotors and safety is ensured by fitting propeller guards.
Vehicle frame	<ul style="list-style-type: none"> • Optimal cross-sectional layout using high-rigidity aluminum frame ladder and truss to create the fuselage frame. • Topology optimization* for lightweight and rigid frame (*structural optimization using computer simulation).

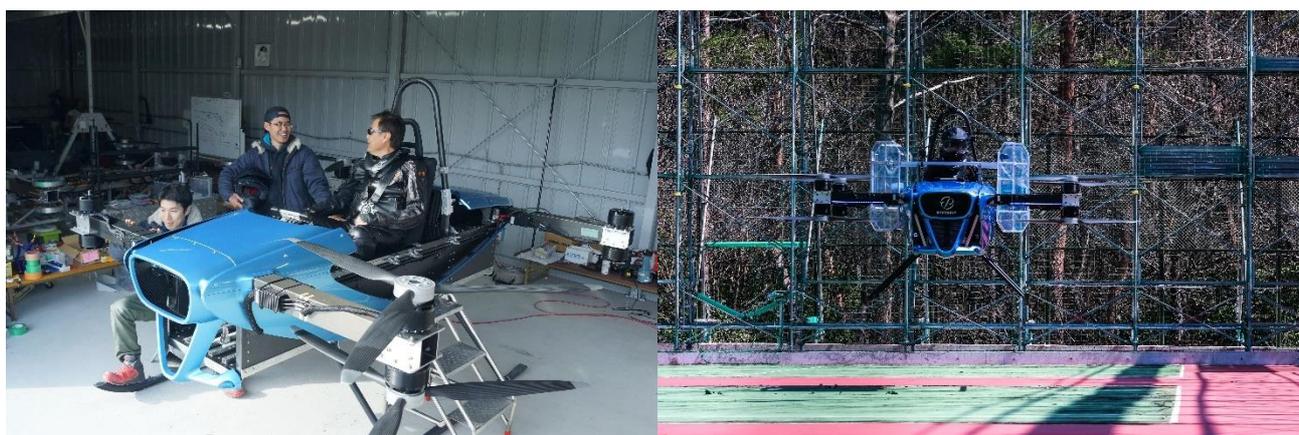
SD01 1/1 scale unmanned aircraft



PROGRESS OF AIRCRAFT DEVELOPMENT

SD-02 (2019 – Spring 2020): Japan’s first manned flights of a flying car

Manned test flights started in December 2019 and the first phase of technical verification was completed safely in the spring of 2020. The trials focused on assessing the maneuverability and flight stability of the SD-02 test model through a series of in-flight tests aiming to identify technical characteristics that needed to be improved, which could only be detected during manned flights. The findings have been reflected in the design of the SD-03, the successor to the SD-02, which is focused more on meeting the standards required for aircraft to receive an airworthiness certificate, which is the next phase of development.



FLYING CAR: SD-03 MANNED FLIGHT MODEL



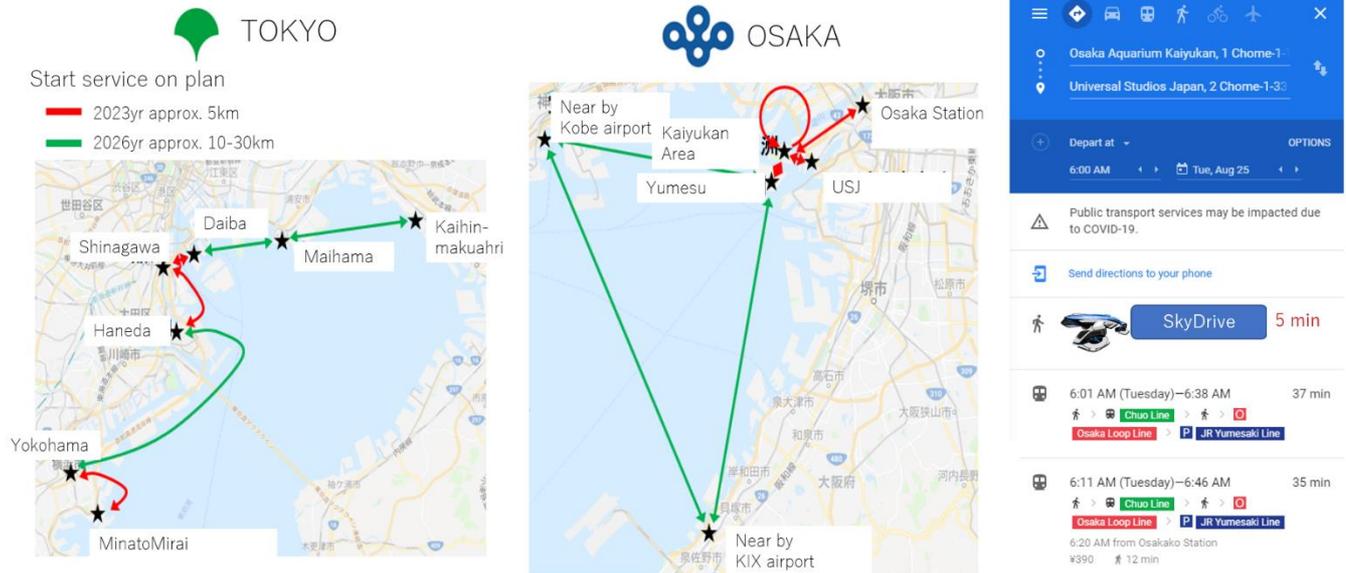
Size:	Overall length x overall width x overall height Approximal 4,000mm × 4,000mm × 2,000mm
Weight:	Approximal 400kg
Flight system:	8 motors and propeller
Battery:	Electrical battery KW is confidential
Materials :	Introduce optimized materials for cost saving by using Carbon, aluminum and others
Max speed :	40-50 km/h
Max flight time:	5-10 min

FLYING CAR USE CASE

The flying car being developed by SkyDrive will enable point-to-point transportation not only as an air taxi but also in settings such as entertainment, tourism, and emergency medical care, among others. The car is compact and convenient to use with regard to parking and hangar space because it only requires the equivalent of the space taken up by two regular passenger cars. In addition, our design objective with regard to the space required for taking off and landing is quite different from a conventional heliport-type facility; we aim to be able to use something close to the backyards of our daily lives. We want to make flying cars a familiar and convenient means of transportation by 2023 and hope that by doing so we will contribute to the betterment of society.



FLYING CAR USE CASE



More specifically, we are targeting the launch of a commercial manned air mobility service in 2023 and have set our sights on the bay areas of Tokyo and Osaka as our first potential flight zones. It should be easier to obtain permission to fly over bodies of water in view of safety considerations and a certain level of demand for such a service can be expected to exist in those two metropolitan areas. We are working with government agencies and partner companies to make the plan a reality. Our development target for the initial phase in 2023 is a flight time of 5–10 minutes to move 5–10 km, compared with the 20–40 minutes currently required by ground transportation. We expect to be expanding the flight distance to some 20–30 km by 2026.

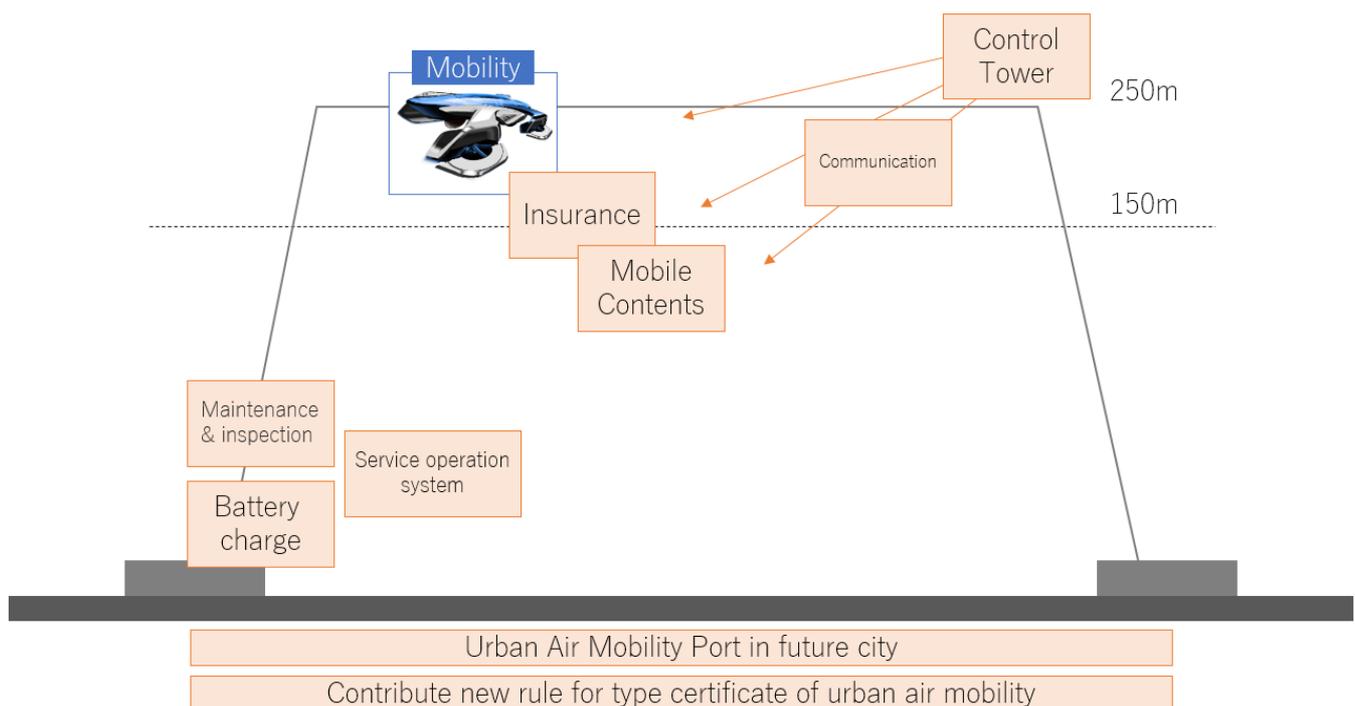
Working on Additional Elements that Need to Be Realized

Based on the roadmap for the air mobility revolution created by the Public-Private Council for Air Transportation Revolution mentioned earlier, we will continue to promote the development of aircraft and new technologies, test flights, and verification tests, while also working to establish the necessary regulations and systems required for the widespread operation of flying cars.

With 150 meters set as our flight altitude target in the first stage, we are in ongoing discussions with all concerned parties regarding the creation of an environment that enables flying car operations over water and city streets under the direction of an air traffic control tower.

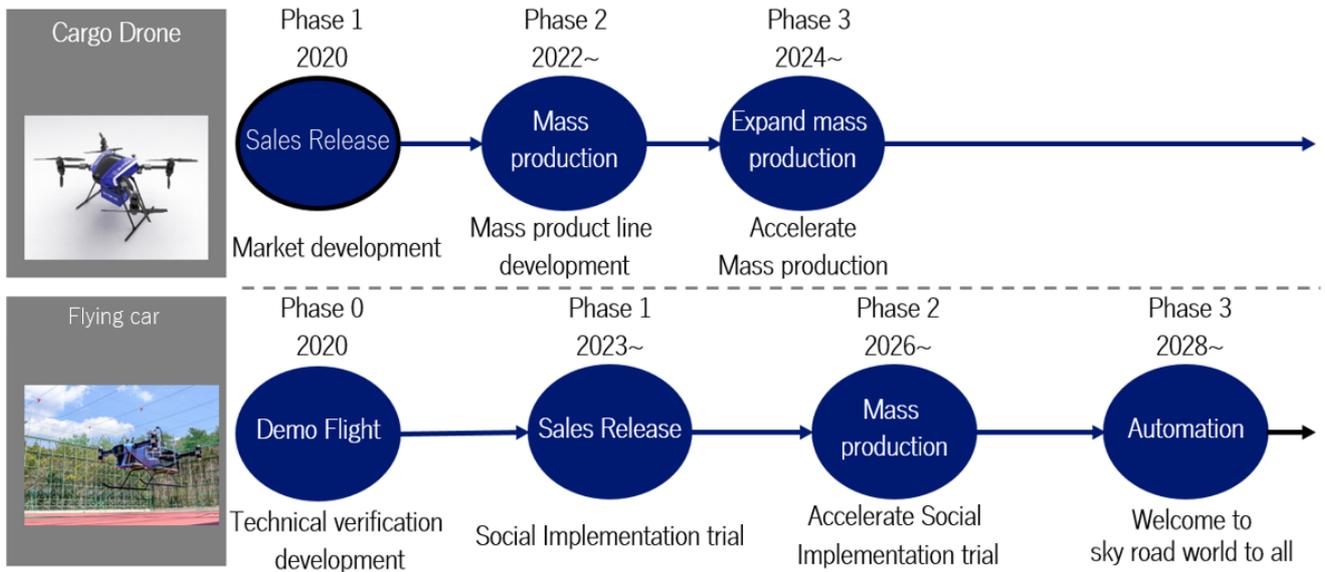
When a seamless boarding-to-arrival mobility service becomes a normal part of our social infrastructure, people's daily lives will be made easier by a new, stress-free mode of transportation available at any time.

Other work remains to be done in order for flying cars to become a familiar three-dimensional mobility option for people's daily lives. Charging stations for the electric batteries in the aircraft need to be developed and established and a network of after-sales service facilities will also have to be created.



Milestones towards Commercialization

The public-private coalition is advancing the project according to the road map to revolutionize mobility in the sky. SkyDrive is the first flying car to obtain outdoor flight permission in Japan. Led by a qualified pilot, a proof of concept is under way to put the flying car through test flights.



ACTIVITY

Collaboration with Local Governments

To help with our effort to bring the technology to practical application, local governments are providing us with free use of development location and their cooperation and support in creating systematic groundwork.

February 2019: Selected as “Innovation Tokyo Project for the Future” by the Tokyo Metropolitan Government.

May 2019: Concluded “Cooperation Agreement on the Development of ‘Urban Air Mobily’ for Creation of New Industry” with Toyota City, Aichi Prefecture

February 2020: Fukushima Robot test field



Markets

January 2020: Took the podium at the Transformative Vertical Flight 2020.

September 2019: Exhibited in Japan Pavilion at the IFA, a consumer electronics show.



Shareholders AS OF AUG 2020

Itochu Corporation
 ITOCHU Technology Ventures, Inc.
 ENEOS Innovation Partners Godo Kaisha
 Ohbayashi Corporation
 Energy & Environment Investment, Inc.
 STRIVE, Inc.
 Z Corporation inc.
 DRONE FUND Inc
 Development Bank of Japan Inc.
 NEC Corporation
 VeriServe Corporation
 Sumitomo Mitsui Finance and Leasing Company, Limited

SPONSORS AS OF AUG 2020

Many companies have provided us with their support since CARTIVATOR era, with whom we have engaged in joint development, was founded.



Over 100 sponsors

CONTACT

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WEB Site <https://en.skydrive2020.com/>