

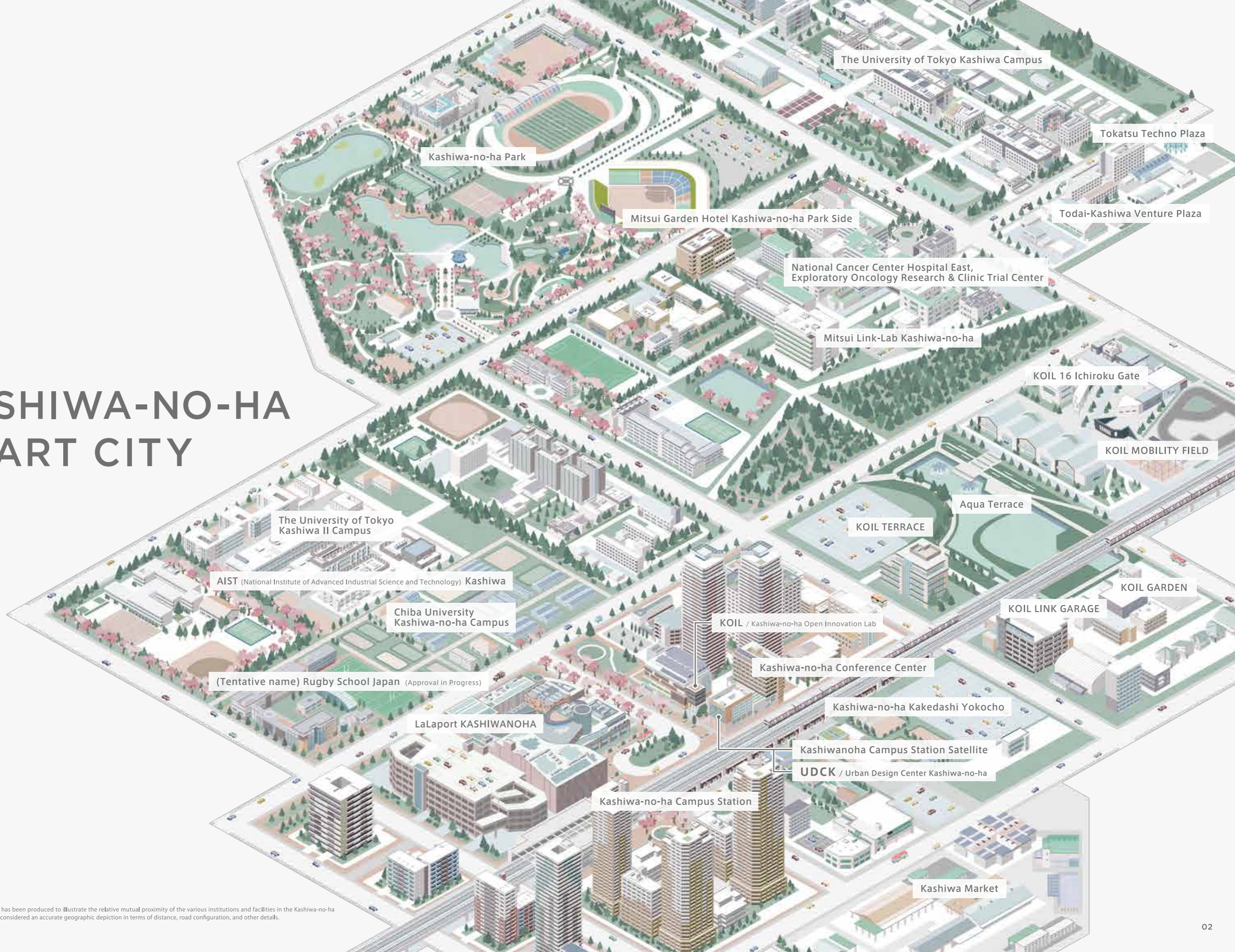


UDCK
Urban Design Center Kashiwa-no-ha

www.udck.jp

KASHIWA-NO-HA SMART CITY
Co-Creation brochure

KASHIWA-NO-HA SMART CITY



*The above map image has been produced to illustrate the relative mutual proximity of the various institutions and facilities in the Kashiwa-no-ha area and should not be considered an accurate geographic depiction in terms of distance, road configuration, and other details.



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**The Smart City –a community
and citizens growing together in an environment rich
in natural beauty and vision**

Kashiwa-no-ha International Campus Town Initiative has 8 goals including “Create a Garden City with a Symbiotic Relationship” and “Implement High-Quality Urban Space Design”.

With the aim of harmonizing natural beauty and urban vitality, Kashiwa-no-ha is now providing various scenes for people to fulfill and enrich their lives.

“Create an Innovation Field City” is another of our goals.

Key city “players*” with state-of-the-art technology and ideas come together in this city embraced by a green environment to tackle issues and challenge the building of a new future.

* “Player” describes any organization or individual who comes to “play” an active role in shaping the future of this city.



MISSION

Making a Global Vision a Reality

Key “players” from diverse fields, each aiming to solve key issues in their domains of expertise, coming together to shape and share a vision of the future with the world.

Founded on this concept, Kashiwa-no-ha Smart City has been challenging the building of a new future.

Through a collaboration of the public-private-academic sectors, a shared commitment to the Kashiwa-no-ha International Campus Town Initiative and a laser focus on the future, we have advanced the concept of “Neighborhood Creation” and built a city that blazes a trail to tomorrow for the world.

Now development is entering a new stage.

“Co-creation” is the keyword that will not only unlock solutions impossible to solve alone, but also empower a city that will give birth to innovative value.

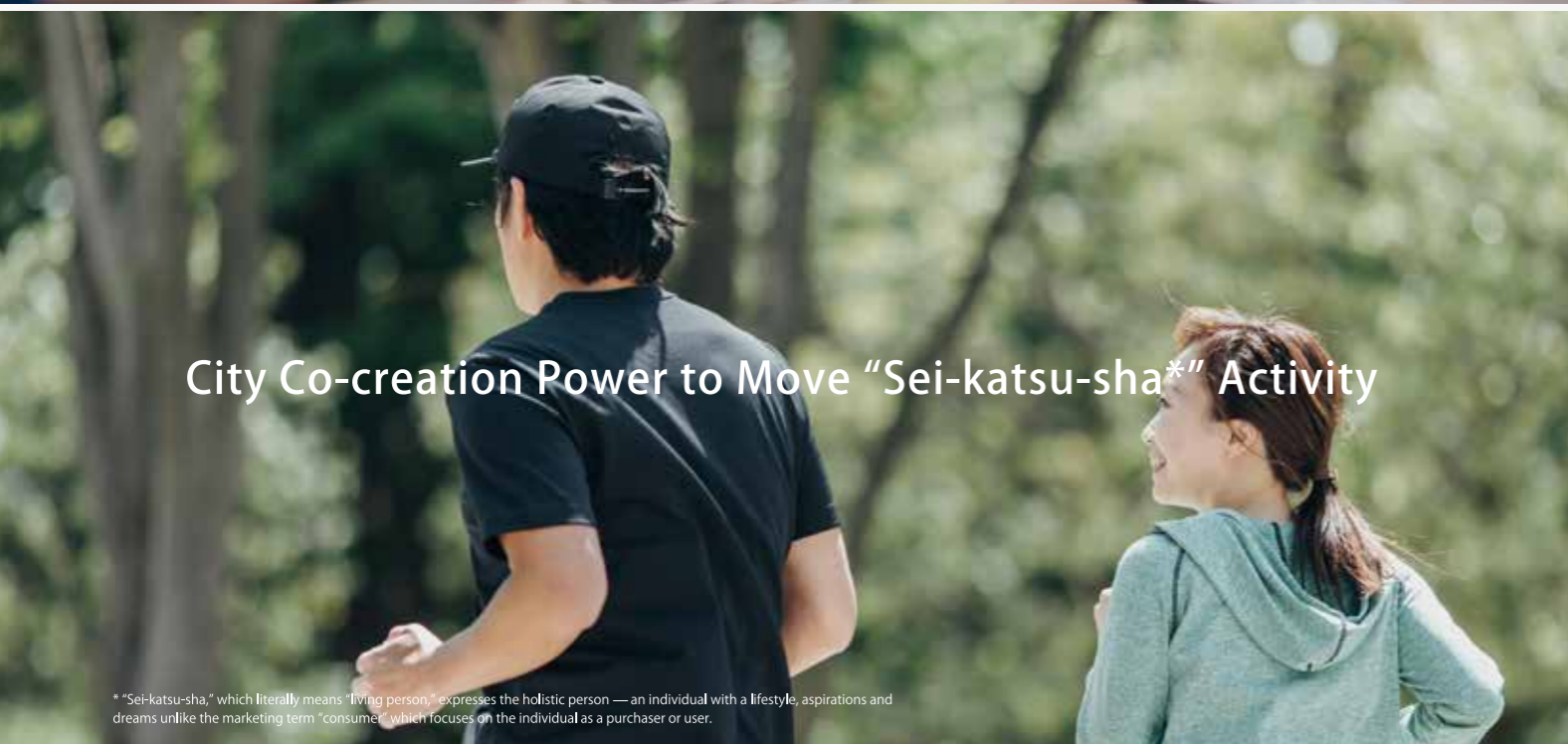
■ From “Problem-Burdened Developed Country” to “Problem-Solving Advanced Nation”

Take for example, the super-aging society. Japan was one step ahead of the rest of the world in coming to grips with this challenge. In the future, many countries around the world are also expected to confront issues of a declining birthrate and an aging population. That’s not the only social issue we face. There are challenges in economics, energy, and the environment. Can we solve these problems by bringing together the power of the public, private and academic sectors with the city as a platform? That’s what Kashiwa-no-ha Smart City has been endeavoring to achieve. In close collaboration, those sectors are tackling these three themes and shaping a vision of the future for the world. With the aim of finding ever better solutions to all these challenges, Kashiwa-no-ha Smart City is accelerating “Co-creation”.





City Co-creation Power to Fuel Corporate Growth



City Co-creation Power to Move "Sei-katsu-sha*" Activity

* "Sei-katsu-sha," which literally means "living person," expresses the holistic person — an individual with a lifestyle, aspirations and dreams unlike the marketing term "consumer," which focuses on the individual as a purchaser or user.



City Co-creation Power to Drive Research & Development

VISION

City Co-creation Power - the Driving Force to the Next Stage

"Co-creation" is the creation of innovative value born of the chemical reaction bringing together a diversity of organizations and human resources possessing different knowledge, ideas, technologies and data, and their collaborative exploration of new possibilities.

It is also increasingly the essential key to unlocking innovation.

Kashiwa-no-ha Smart City was built from zero through the collaboration between the public, private and academic sectors.

From the conception, this city has been the product of an uninterrupted process of "Co-creation".

From the start, key "players" bringing technologies with the potential to change the world have gravitated this city and found an advanced co-creation environment already in place.

The city co-creation power will spark and fuel the growth of companies, activate the lives of the people who live, work and visit the city, and drive R&D.

Guided by our vision and looking ahead years and decades in the future and beyond, Kashiwa-no-ha Smart City will keep co-creation edge honed to a cutting edge.

■ In "Kashiwa-no-ha Smart City", companies are creating the "Next-generation Management Model"

Open Innovation Management

When a company faces problems that cannot be solved with their own resources, the "Open Innovation Management" strategy empower it to seek solutions by incorporating technology, know-how, and ideas from outside the company. Co-creation with research institutes and companies at the bleeding edge of their fields enable the development of new products and services.



KOIL/Kashiwa-no-ha Open Innovation Lab

Health and Welfare Management

A relaxing office environment surrounded by natural beauty, with residences, commercial facilities, parks, and sports facilities all conveniently located within walking distance. This integrated work-life-recreation-education environment enables a management style that can support the mental and physical well-being of employees and enhances their happiness.



Aqua Terrace

ESG Management

Sustainable initiatives aimed at balancing business and the environment both lead to improved corporate value and contribute to attracting human resources. In addition to promoting the utilization of clean energy through city-wide energy-saving design, Kashiwa-no-ha Smart City has prepared an environment for fostering fields in synch with ESG management ideals.



Kashiwa-no-ha Smart Center

FLOW

The Entire City is a Field for Open Innovation.

Since the 1990s, the University of Tokyo and Chiba University have established cutting-edge research institutes one after another in the Kashiwa-no-ha area.

In 2006, the two universities in collaboration with Chiba Prefecture, Kashiwa City, and the private sector established UDCK (Urban Design Center Kashiwa-no-ha).

This marked the launch of serious pursuit of urban development through co-creation by the public sector, private sector, and academia with UDCK as the nucleus.

Today even more organizations are participating.

The co-creation environment has become even more comprehensive and attractive.

In fact, the entire city functions as a field of open innovation – a place where diverse people, values, and information congregate and interact.

Kashiwa-no-ha Smart City has found a way to maximize the power of the city and a mechanism to nurture co-creation.

Right now, somewhere in the city, epoch-making projects are on their way to creating innovative value.

CHAPTER
01

UDCK (Urban Design Center Kashiwa-no-ha)

UDCK is a base for promoting the urban development of Kashiwa-no-ha Smart City and serves as the co-creation platform that connects and supports “players”.

CHAPTER
02

Co-creation “Players”

From the pinnacle of Japanese academia to government agencies, listed companies and startups, a diverse range of “players” whose values and aspirations resonate with Kashiwa-no-ha’s co-creation model have been attracted to the city to collaborate and innovate.

CHAPTER
03

Co-creation Environment

We have a full range of hardware and software to support your business, such as demonstration experiment fields, data infrastructure, and advanced facilities.

CHAPTER
04

Co-creation Case Study

Centered on UDCK, already numerous examples of co-creation by “players” have been produced in this sophisticated co-creation environment.



CHAPTER 01

UDCK

UDCK (Urban Design Center Kashiwa-no-ha) is an organization managed collectively by eight constituents from the public, private and academic sectors.

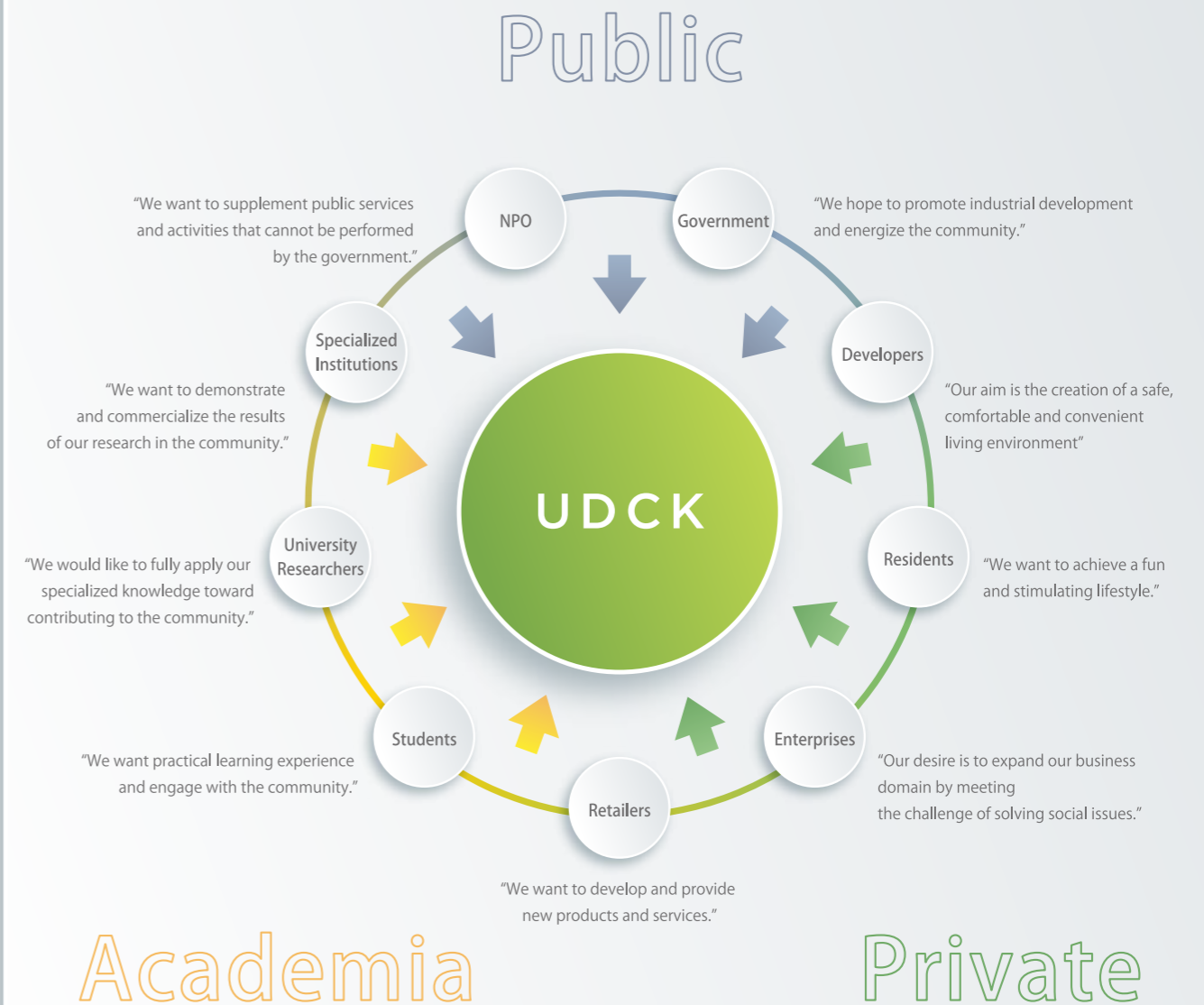
It serves as a co-creation platform that bridges all the “players” including universities, research institutes, government, residents, companies based in Kashiwa-no-ha, and companies that wish to participate in new projects.



UDCK's 3 Functions

<p>Think Tank</p>	<p>Coordination and Support</p>	<p>Information Dissemination</p>
<p>This function focuses on learning, research, and formulating proposals related to urban development. Leveraging our expertise, UDCK is responsible for advancing and implementing the specific goals and policies for the Kashiwa-no-ha area as set forth in the “Kashiwa-no-ha International Campus Town Initiative”.</p>	<p>Based on the “Kashiwa-no-ha International Campus Town Initiative”, UDCK will formulate plans to transform policy into action, explore commercialization, and coordinate actual execution. Serving as an intermediary connecting key “players”, we will support co-creation and sustainable operations.</p>	<p>Via websites, printed media, press releases, forums, and other means of communicating and engaging society. UDCK will widely disseminate information about the various initiatives in the Kashiwa-no-ha area. Through this function, we will endeavor to promote understanding of urban development and invite participation.</p>

Role as a Co-creation Platform



UDCK listens to views of the public, the private sector, and academia, and then coordinates and promotes a collaborative response, giving birth to new communities and launching of new projects. By fully utilizing the extensive facilities and mechanisms of Kashiwa-no-ha Smart City to accelerate co-creation, UDCK multiplies our ability to solve problems.

CHAPTER 02

Co-creation "Players"

From the peak of academia to government agencies, global companies, and startups.

From life sciences to mobility, energy and IT. Kashiwa-no-ha City is already home to a wide diversity of "players" and is always welcoming new participants as we look to expand the scope of our co-creation efforts even further in the future.



Kashiwa City

Kashiwa City is one of the constituent bodies who collectively manage and operate UDCK. Unlike conventional government-driven urban development, Kashiwa City is looking to "flat" public-private-academia collaboration for neighborhood creation solutions to urban development issues impacting the community.



National Cancer Center Hospital East, Exploratory Oncology Research & Clinic Trial Center

With the mission of providing patients with "the world's best cancer treatment" and creating "new world-class cancer treatments", the Center is also developing therapeutic drugs and medical devices in collaboration with universities and companies.



AIST (National Institute of Advanced Industrial Science and Technology) Kashiwa

One of only three Designated National Research and Development Institutes in Japan. In cooperation with business and industry, the Institute provides intellectual property, technology, human resources, and research facilities born from their world-class research and development.



Chiba University Kashiwa-no-ha Campus

At the Campus, the Environmental Health Field Science Center pursues education and research on food, greenery, and health and through various interdisciplinary programs, is seeking to unleash the "power of plants".



The University of Tokyo Kashiwa Campus

All the cutting-edge scientific research from the University's Graduate School of Frontier Sciences, Institute for Solid State Physics, and Institute for Cosmic Ray Research can be found at this Campus, where the University is also actively promoting technology transfer to industry and co-creation with companies and local government.



Mitsui Fudosan Co., Ltd.

As an integrated developer, Mitsui Fudosan aims to create new value by meeting the challenge of solving social issues through neighborhood creation projects and initiatives, and guided by three themes: "Environmental Harmony," "Health and Longevity," and "New Industries Creation."

Life Science



ARCALIS, Inc.

While providing drug discovery support for messenger RNA (mRNA) drugs and vaccines, ARCALIS aims to be the world's first integrated contract development and manufacturing organization (CDMO).



H.U. Group Holdings, Inc.

While its business is focused on lab testing services (LTS) and In-Vitro Diagnostics (IVD), H.U. Group pursues the development of a wide range of healthcare businesses including support services at medical institutions, and provides products and services all over the world.



TEIJIN LIMITED

While globally expanding their businesses in materials, healthcare, textiles and related products, TEIJIN is co-creating a regenerative medicine platform in Kashiwa-no-ha.

Mobility



NTT DOCOMO, INC.

Focusing on the keyword "next-generation mobility" and the "C" in the emerging CASE (Connected, Autonomous, Shared, and Electric) trend in the auto industry, NTT DOCOMO is exploring the application of cellular communications to support safer driving and society.



Advanced Smart Mobility Co., Ltd.

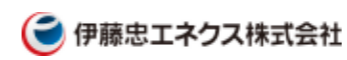
This University of Tokyo start-up is using technology of the Advanced Mobility Research Center, Institute of Industrial Science, the University of Tokyo in its research and development of the next-generation of mobility.



Turing Co., Ltd.

Founded by experts in the fields of machinery, robots, and AI, this AI technology startup is developing Level 5 fully automatic EVs requiring zero human driver attention and interaction.

Energy



ITOCHU ENEX CO., LTD.

This energy trading company in the ITOCHU Group is contributing to realizing a sustainable society through its focus on renewable energy and other next-generation energy businesses.



Exergy Power Systems Inc.

This University of Tokyo start-up aims to pave the way for a sustainable society through distributed energy services that utilize proprietary power storage battery technology.



Hitachi, Ltd.

Hitachi has been responsible for system construction and operational support for Japan's first AEMS (Area Energy Management System), realizing power interchange across city blocks.

KASHIWA-NO-HA DATA platform



NTT DATA Corporation

With the aim of creating innovative value using health data, NTT DATA is providing the "Health Data Bank" cloud-based service to support health management at the "SMART LIFE PASS KASHIWA-NO-HA" portal site.



BIPROGY Inc.

With the aim of contributing to the solution of social issues, this system integrator collaborated with Mitsui Fudosan to develop and provide "Dot to Dot", a decentralized platform that enables "consented" movement of personal data across safely and securely across business sectors and industries.



Link & Communication Inc.

This health tech company is creating new health services, for example, "SMART LIFE PASS KASHIWA-NO-HA" which provides access to their AI health app "Calomama Plus".

Companies based in KASHIWA-NO-HA



Algal Bio Co.,Ltd

This bio-venture company pursues R&D in microalgae - biomaterial with a promising future in a wide range of fields from functional foods and feeds/fertilizers to fuels.



Haft

Entrusted with the operation of KOIL FACTORY PRO and KOIL MOBILITY FIELD, Haft develops and supports "mobile robots" for use in agriculture and retail sales.



Fuller, Inc.

Headquartered in Kashiwa-no-ha and Niigata, this IT company provides planning and development of products related to the digital domain as well as smartphone app data analysis services.

CHAPTER 03

Co-creation Environment

Creating a community to serve as an "Open Innovation Field" capable of continuously generating and nurturing co-creation requires constantly exploring questions such "What does this city need?" and "How can we trigger new co-creation synergies?"

Enhancing the hardware and software that support business, for example, demonstration and trial "field" zones and centers, a robust forward-looking data infrastructure, and access to advanced facilities has created an environment that welcomes and eases participation by a wide diversity of companies.

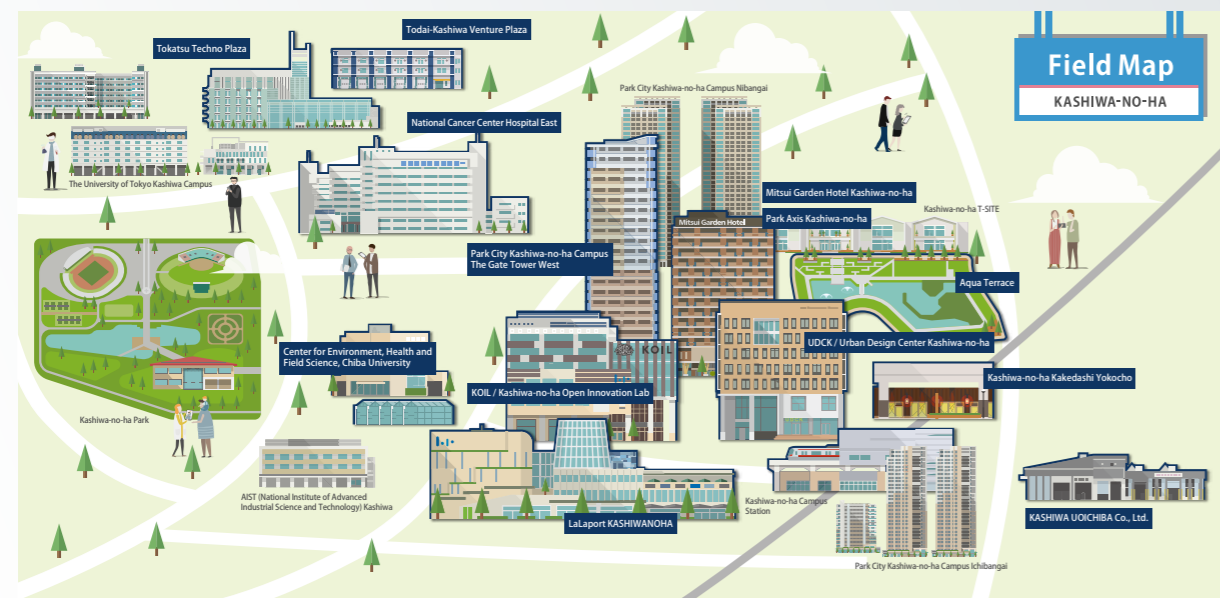
An entire city as a fertile field for the demonstration of new technologies and knowledge.

■ "Innovation Field KASHIWA-NO-HA"

Within all imaginable functions condensed within a 3-km radius, Kashiwa-no-ha Smart City can be effectively used as demonstration platform. Demonstration trials that will result in the creation and refinement of new products and services are welcome. Already numerous projects in IoT, life sciences and other fields have been successfully pursued here. The comprehensive support system coordinated by UDCK enables project participation by all interested parties regardless of company size or industry.

Core members | UDCK, Mitsui Fudosan Co., Ltd., and Kashiwa City

Participants | Chiba Prefecture, Tokatsu Techno Plaza, National Cancer Center Hospital East, Todai-Kashiwa Venture Plaza, TX Entrepreneur Partners, The Kashiwa Chamber of Commerce and Industry



■ Examples of Projects at "Innovation Field KASHIWA-NO-HA"

"Remote check-in" service using IoT technology to reduce patient waiting times and streamline hospital operations

"Turn the entire town into a hospital waiting room." This concept inspired project participation by the National Cancer Center Hospital East and others. When arriving at Kashiwa-no-ha Campus Station, a smartphone app uses GPS to notify reception of the approaching arrival of the patient and remotely "check-in" for the appointment. Demonstration trials of this service are underway.

Demonstration research on the effects of aged hops on "brain health" (Kirin Holdings Co., Ltd.)

In collaboration with KOIL, Kashiwa-no-ha residents and commuters were invited to participate in this empirical study and consumed non-alcoholic beer containing aged hops for three weeks. The beverage's effect on mood and subjective cognitive function was verified. Further development of such research and support services can lead to improved mental health and the resolution of other issues.

Supporting startups and creating new industries.



■ AEA (Asia Entrepreneurship Awards)

This international business award from Japan brings together young entrepreneurs from all over Asia under one roof. Technology startups recommended by experts in each country are invited to participate. After each awards event, a growing number of the participating entrepreneurs have launched new businesses in Japan and have made great strides.



■ TEP (TX Entrepreneur Partners)

One of Japan's leading startup support organizations, TEP was established with the aim of commercializing Japan's top-level technology and deploying it in society. Working closely with TX-engaged universities, research institutes and government bodies TEP have formed a large ecosystem of technology startups.



■ KOIL STARTUP PROGRAM

Supporting the growth of startups that lead the creation of new industries, this program provides an environment essential to startups in the initial stage of business to promote growth. Support includes free use of coworking space for one year, business plan building seminars, and individual mentoring by experts.



■ Kashiwa-no-ha IoT Business Co-Creation Lab

More than a merely a place, this is a community of IoT/big data experts. Using Microsoft Azure as a platform, know-how is shared through their joint verification of IoT projects. The Lab is also seeking participation by businesses to co-create IoT projects.

Platform for co-creation with consumers

■ Minna no Machizukuri Studio



This public-private-academia platform is focused on engaging city residents in the co-creation process. Together with consumers, it becomes possible not only to conceive never-before-imagined products and services, but also to demonstrate and deploy them.

■ Town Health Center "A-SHI-TA"

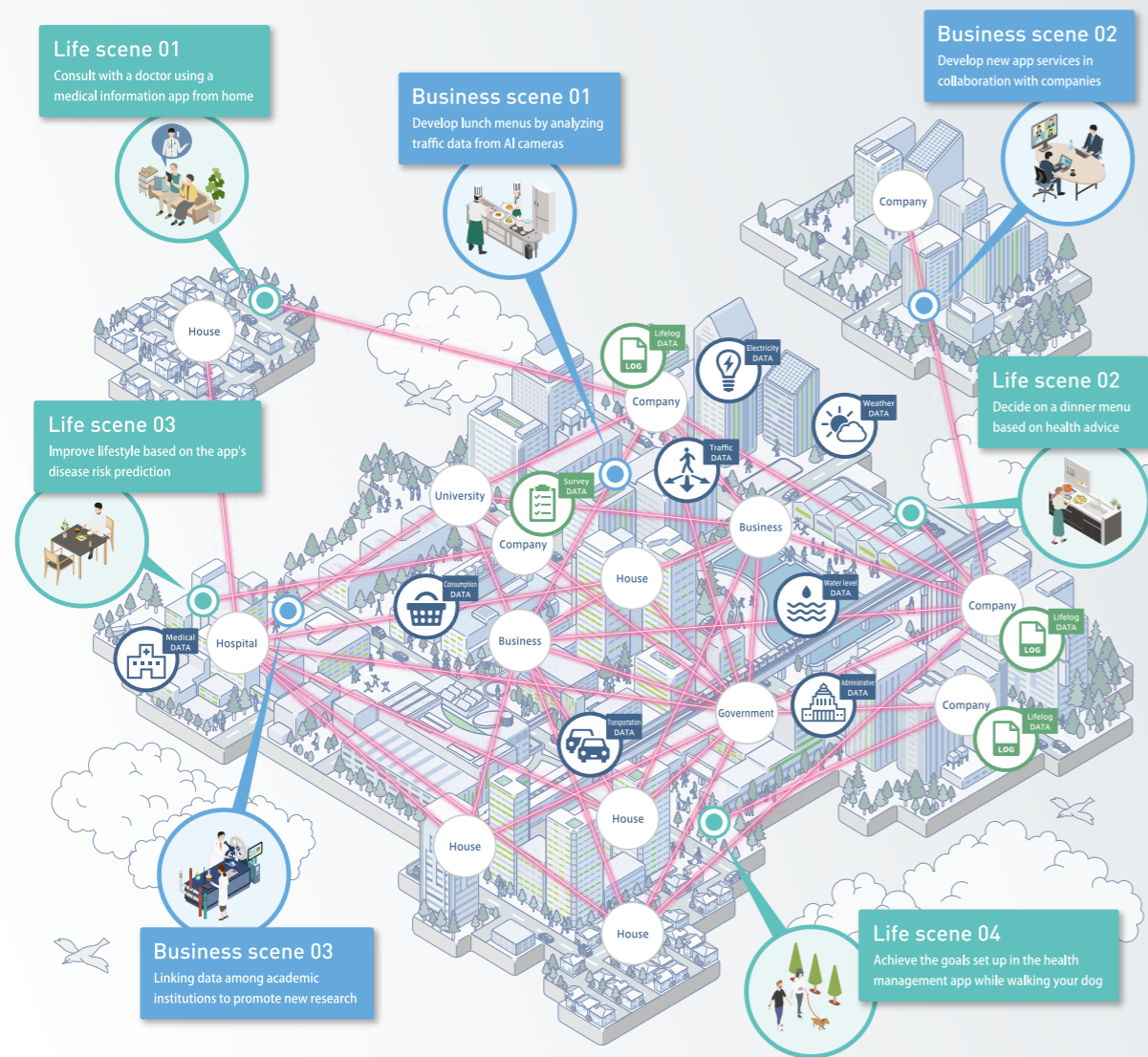


This community base for cutting-edge healthcare information provides participating companies with a means to acquire and monitor valuable health data and establish ongoing communication with consumers.

Cyberspace for access and utilization of data not in your company's possession.

Kashiwa-no-ha Data Platform

"Dot to Dot" platform enables the safe and secure inter-company exchange and linking of personal data with the subject's consent. Based on this data exchange platform, the Kashiwa-no-ha Data Platform has been built with the aim of creating a future in which data owned by companies, research institutes, governments, etc. can be more effectively utilized. This capability to link and utilize data that are internally unavailable to a company opens the door to new insights and the potential development of new products and services. One example is the SMART LIFE PASS KASHIWA-NO-HA: a portal site that makes use of personal data to provide innovative services to consumers.



World-class communication infrastructure.

LoRaWAN® / 5G / Wi-Fi

Formally recognized internationally and increasingly adopted around the world, the IoT wireless LoRaWAN® standard has been deployed in the Kashiwa-no-ha area. IoT technology is already facilitating various demonstration trials. Also, facilities with a 5G communications environment are increasing. By providing world-class telecommunications infrastructure, the city is propelling efforts to create and advance new industries.

Data shape and drive future services.

AI camera / IoT sensors

Installation of AI cameras in the vicinity of Kashiwa-no-ha Campus Station provide data for real-time image analysis that leads to safer and more secure town management. IoT sensors measure and record urban environmental values such as temperature, sound, carbon dioxide, and even odors. Possible future application of these data is now being studied.

Incubation facility for nurturing co-creation



Tokatsu Techno Plaza

This industrial support facility in Chiba Prefecture hones the technical and development capabilities of local companies, helps to create new industries, and fosters venture companies in a public-private-academia collaboration. Supporting ventures from both technology and management perspectives, Tokatsu Techno Plaza is promoting regional innovation and advancing collaboration in the field of medical-engineering.



Todai-Kashiwa Venture Plaza

Organization for Small & Medium Enterprises and Regional Innovation, the University of Tokyo, Chiba Prefecture, and Kashiwa City combined their efforts to operate this facility for fostering entrepreneurs. All rooms in Venture Plaza are equipped with wet labs (32 to 143 m²) meeting P2-level experiment requirements. Expert staff are also available to support commercialization.



Mitsui Link-Lab Kashiwa-no-ha

This seeds proximity-type rental lab* leverages its location near Japan's leading academic and medical facilities. Designed to support collaboration with academia and startups, the floor plan includes subdivisions of about 100m² or more, smaller preset subdivisions, and a common equipment room.

* A seeds proximity-type facility that harnesses the special qualities of the area, where leading academic and medical facilities are located.



KOIL / KOIL TERRACE

At these two facilities is office space to support creative business. KOIL (Kashiwa-no-ha Open Innovation Lab) supports startups and can also be used by visitors. Featuring a waterside location and an abundance of common areas and amenities, KOIL TERRACE is a base for industrial creation.



KOIL FACTORY PRO

In this "members only" co-working facility, members can bring their own tools and materials, and immediately get to work, making things. Members have access to a woodworking/metalworking area and an electronic work area. It is located near KOIL MOBILITY FIELD where drones and autonomous driving testing is possible.



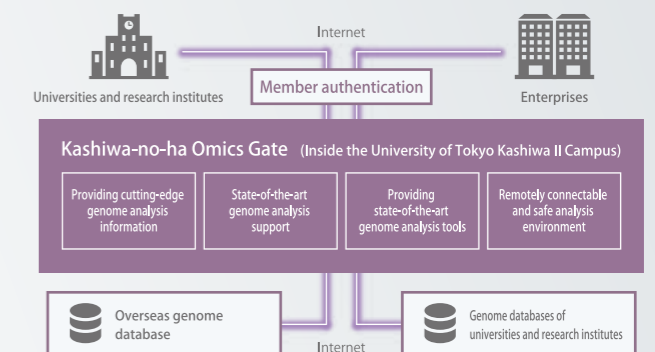
KOIL MOBILITY FIELD

This is one of the largest outdoor robot development and verification centers in the greater Tokyo metropolitan area. Here solutions to problems in Japan's robot-related industries are explored in an environment where robots under development, such as in the fields of autonomous driving and micro-mobility, can be tested safely and easily.

Support for medical and pharmaceutical research companies.

Kashiwa-no-ha Omics* Gate (KOG)

Providing the first super advanced genome analysis services in Japan, KOG also provides cutting-edge genome analysis information. The facility aims at strengthening cooperation between the academic institutions pursuing genome analysis research in Kashiwa-no-ha, and the companies expected to drive the establishment of treatment methods for many diseases including cancer.



* "omics" collectively describes the disciplines in biology ending in the suffix -omics, such as genomics, proteomics, metabolomics, etc.

CHAPTER 04

Co-creation Case Study

The mission of Kashiwa-no-ha Smart City is to create a city that embodies our vision for the world's future.

In the course of achieving this goal, the city is giving birth to co-creation in the fields of life sciences, mobility, and energy. Here are few examples:



Vision of the future of the life sciences

A city that creates new medical care and treatments

Kashiwa-no-ha Smart City provides not only a well-developed environment designed to drive cutting-edge R&D, but also proximity to a concentration of life science-related universities, research institutes, medical institutions, listed companies, and venture companies.

The formation of this base for life sciences has been guided by the city's core policies to become: "a city where people enjoy a lifetime of good health" and "a city where innovative medical care is created and nurtured."

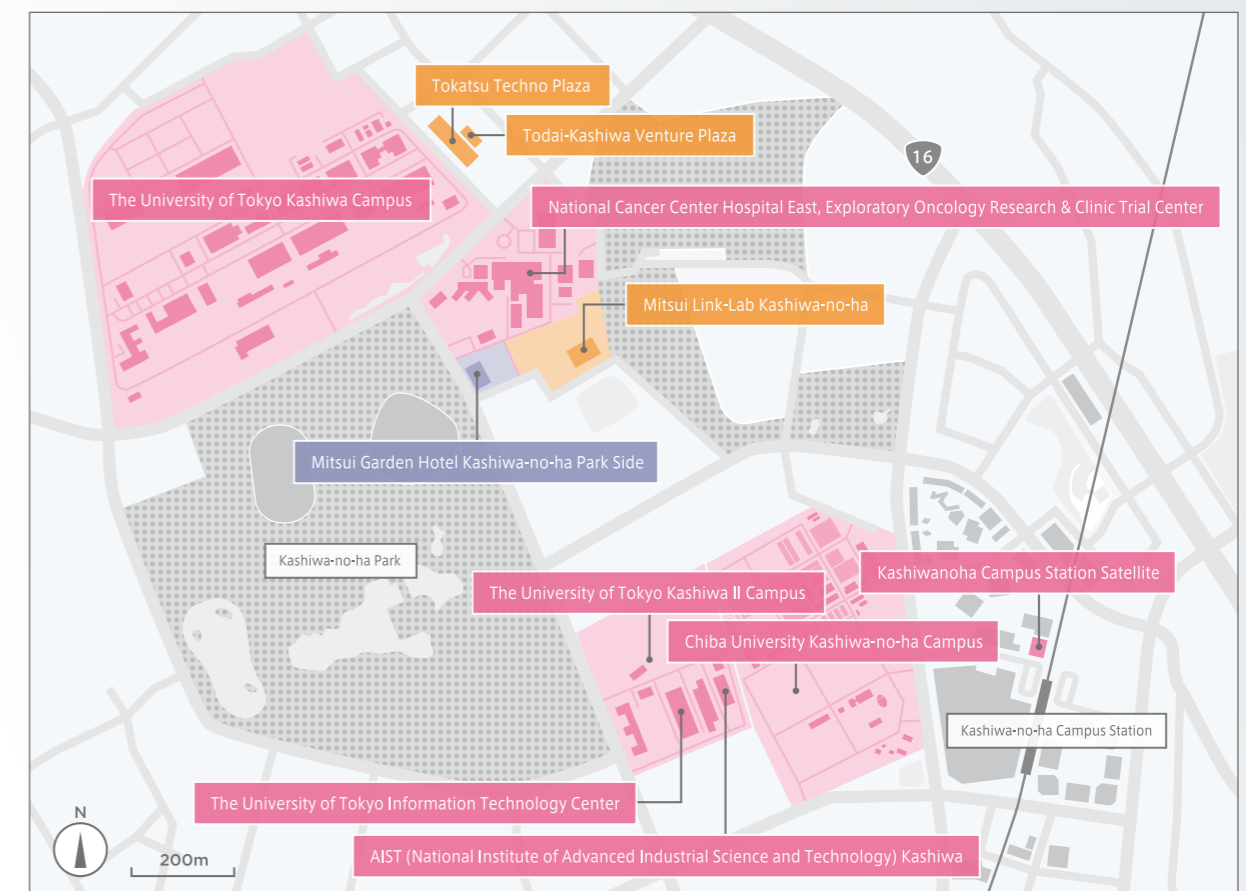
"Unbound by convention, Kashiwa-no-ha Smart City seeks to solve social issues and create new industries through cross-discipline co-creation by top academic institutions, private sector enterprise, public sector entities from local to national, and, of course, resident individuals and other members of the community."

Co-creation "Players"

Science City that is a magnet for cutting-edge knowledge

National Cancer Center, the University of Tokyo, Chiba University, National Institute of Advanced Industrial Science and Technology... many prominent "players" in the field of life sciences are based in this city. In addition, the number of R&D companies and start-up bases is increasing.

- Academia and medical institutions
- Laboratories/research facilities
- others



Co-creation Environment

■ Accumulation of rental laboratories

Various wet laboratories are concentrated in a compact area. A wide range of “players” in the life science field gather to support research and development in an environment that facilitates co-creation. Collaboration among tenant companies and collaboration with surrounding academia has already occurred, and open innovation can also be expected through collaboration between adjacent wet laboratories.

Tokatsu Techno Plaza	Todai-Kashiwa Venture Plaza	Mitsui Link-Lab Kashiwa-no-ha
<ul style="list-style-type: none"> 51 rental laboratories for research and development plus rental conference rooms of various scale and functionality including meeting rooms, seminar/training rooms and multi-purpose halls. Access to test equipment to support manufacturing and R&D activities in the fields of materials, machining, electronics, electrical technologies, etc. Capability requests a variety of testing, inspections and measurement services. Technical support available through various exchange programs with academia, private and public sector parties. 	<ul style="list-style-type: none"> 32 laboratories capable of experimentation up to the P2 level plus availability of multiple rooms and offices. 1F premise space: floor load bearing strength of 2.0t/m², 5m ceiling height, and high-voltage power access plus potential use as a simple prototype factory. Tenant access to support up to full mobilization of an extensive private-public-academia network under the coordination of resident staff for variety of challenges from market development and fund/capital procurement to technology tie-ups. 	<ul style="list-style-type: none"> BSL2-compatible wet lab specifications (some lab rooms/sections are BSL1-compatible). Communication lounge and meeting rooms to energize communication and business. Common equipment room/small space subdivisions for startups planned to open in FY2023. Privately operated laboratory with contract flexibility.

Life Science

Building a regenerative medicine platform.

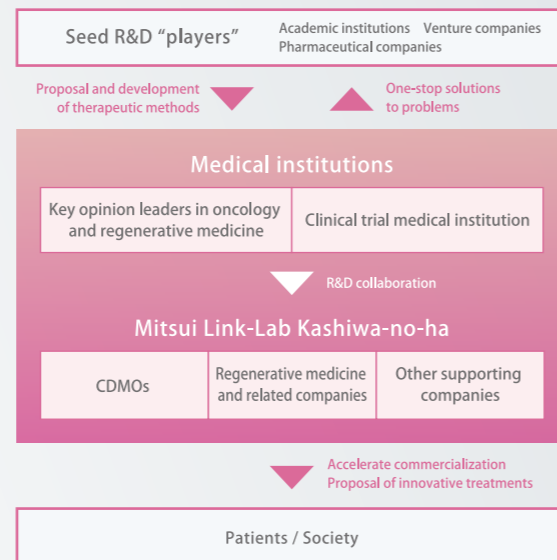
National Cancer Center × TEIJIN × J-TEC × Mitsui Link-Lab Kashiwa-no-ha

■ Support commercialization of regenerative medicine products

This “regenerative medicine platform” will support a one-stop process from regenerative medicine product R&D to business plan formulation and commercial production. At Mitsui Link-Lab Kashiwa-no-ha, TEIJIN and J-TEC are working together to establish a regenerative medicine product CDMO (Contract Development and Manufacturing Organization) center to support “seed holders” with a focus on cancer treatment. The aim is to build a powerful platform for creating innovative treatments for a variety of diseases.

■ Support system for “players” focusing on commercialization

The National Cancer Center draws on its specialized knowledge to provide consulting for seed holders, as well as support collaboration with other technology seed holders. TEIJIN and J-TEC provide consulting services from the standpoint of practical application and are ready to be entrusted with development and manufacturing. Mitsui Fudosan not only provides the venue and support for each initiative, but also serves as a bridge to commercialization of regenerative medicine products – a category of seeds which is difficult to market.



Life Science

Hotel to support cutting-edge cancer treatment.

National Cancer Center Hospital East × Mitsui Garden Hotel Kashiwa-no-ha Park Side

■ Reducing the patient’s burden by locating a hotel on hospital grounds

For patients making frequent or even daily visits to National Cancer Center Hospital East from remote locations, the burden can be heavy. To respond to this problem, Mitsui Garden Hotel Kashiwa-no-ha Park Side opened on the hospital grounds and is staffed by personnel who are given a fundamental understanding of the needs of cancer patient. In addition, full-time care staff are on duty 24 hours a day, and, in the event of an emergency, promptly coordinate their response with the hospital.

■ Contributing to cutting-edge medical care from Kashiwa-no-ha

In the hotel, the hospital area has expanded to accommodate remote and second opinion outpatients. The hotel also provides “SMART LIFE PASS KASHIWA-NO-HA” service to support treatment by sharing vital data from sensing devices with the patient’s consent. Expectations are high for this hybrid facility to become a new medical treatment model. Trials leading to drug discovery and research and development of medical equipment are also under consideration.



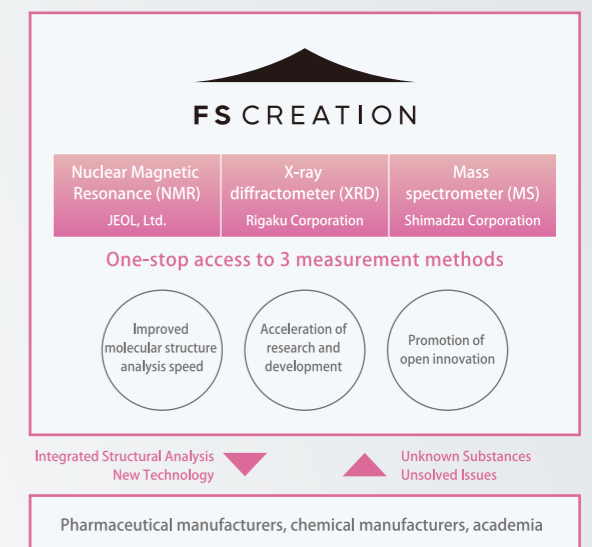
Life Science

Opening of the world's only base for integrated molecular structure analysis.

The University of Tokyo × Institute for Molecular Science × Shimadzu Corporation × JEOL × Rigaku × Mitsui Link Lab Kashiwa-no-ha

■ “FS CREATION” blazing a trail to open innovation

FS CREATION is a co-creation lab where academia and the private sector advance research together. It is the world’s first open innovation base offering one-stop molecular structure analysis - the foundation of life science research. Nobel Prize contender Distinguished Professor Makoto Fujita and Specially Appointed Professor Sota Sato - both from the University of Tokyo comprise nucleus of the academia contingent. From the private sector, three major domestic manufacturers of analysis equipment are participating. The openness of the entirely glass-walled lab provides an environment that facilitates communication.





Vision for the future of mobility

Bringing mobility of tomorrow to everyday life.

Diversification of modes of transportation and improved urban convenience requires making safe and secure autonomous driving a reality, and bringing the future of mobility into daily life. With this goal in mind, Kashiwa-no-ha Smart City has created an environment to support not only controlled evaluation of the technology at private test sites, but also demonstrations on public roads. The provision of this R&D environment has attracted key industry “players” who continue to challenge the world, and new co-creations are born.

Co-creation “Players”

Cooperation with academia for practical application

The University of Tokyo Institute of Industrial Science, the University of Tokyo Mobility Innovation Research Organization (UTmobl), and the University of Tokyo Graduate School of Frontier Sciences are participating in a demonstration experiment of a self-driving bus running in Kashiwa-no-ha.

Coordination of technology development in a “real world” environment

Startups working on cooperative ITS (Intelligent Transport Systems) infrastructure research to support autonomous driving systems and other entrepreneurial companies engaged in development related to autonomous automated vehicles are gathering here.

Co-creation Environment

Field

NTT DOCOMO Demonstration Experiment Environment

In addition to a 5.9 GHz band-compatible V2X-equipped cellular communication system, the environment features the capability to test and demonstrate technology on a vast test course equipped with smart poles.

KOIL MOBILITY FIELD

This demonstration area has been prepared for the development of autonomous driving, micro-mobility, hydrogen fuel cell drones, robotic lawn mowers, and more.

Public roads

Trials and demonstration of the viability of commercial operation of a self-driving bus are currently underway, and accumulating a track record of verification of development and demonstrating “last one mile mobility” on public roads are also in progress.

System

Cooperative ITS (Intelligent Transport System) Infrastructure

Construction and R&D for a cooperative ITS infrastructure with roadside equipment providing information about “blind spot” obstacles, etc. to autonomous vehicles are moving forward.

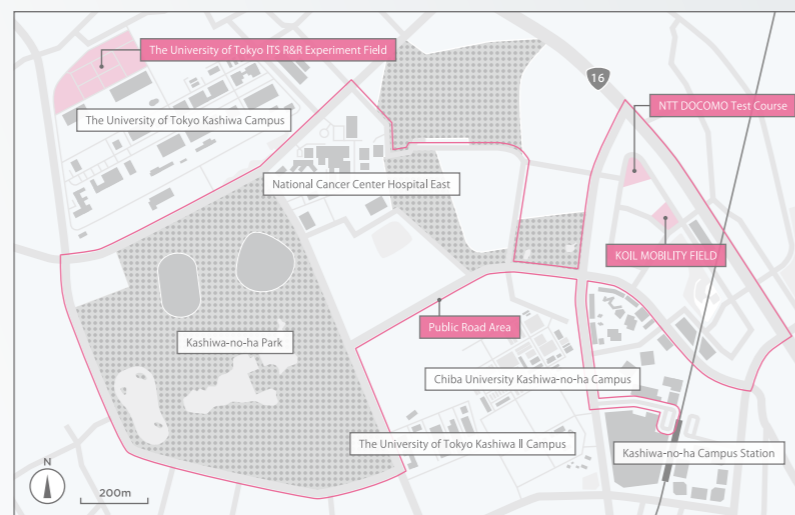
Organization

Kashiwa ITS Promotion Council

Comprising researchers from the University of Tokyo, companies, the government, and the police, the Council is leading the research and development efforts in new mobility and undertaking the demonstration and practical implementation of new technologies.

The University of Tokyo ITS R&R Experiment Field

Equipped with a demonstration area and facilities for conducting full-scale testing in a multi-modal transportation environment, this center features a test driving track with a straight-line distance of up to approximately 300 meters and a “real world” road environment with V2I compatible traffic lights, pedestrian crossings, and railroad crossings. Large-scale experiments difficult to perform in urban areas are possible at ITS R&R Experiment Field.



Mobility

Build an infrastructure environment for making safe autonomous driving a reality.

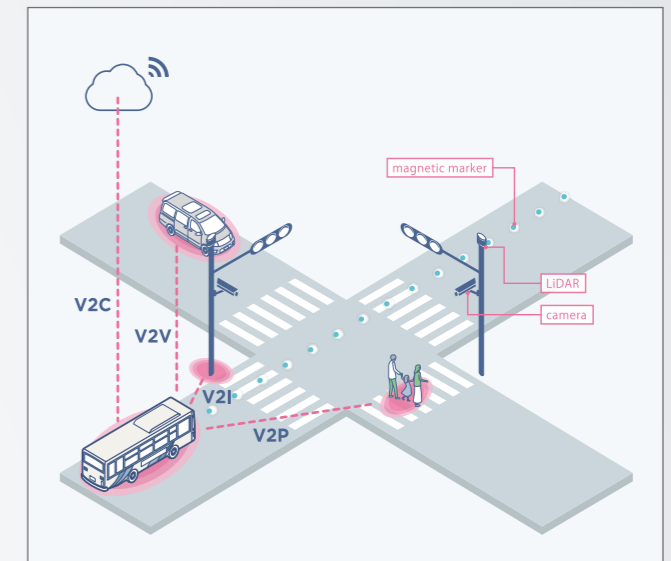
Academia × Private Sector × Public Sector

Model area for “Level 4” autonomous driving R&D

The Ministry of Economy, Trade and Industry (METI) in collaboration with the Ministry of Land, Infrastructure, Transport and Tourism (MLIT), launched the “Automated Driving Level 4 Advanced Mobility Service R&D and Social Implementation Project.” The Kashiwa-no-ha district is one of the designated model areas focusing on the fourth Project theme: “tackling the inter-relating issues of cooperative ITS infrastructure, vehicle-vehicle distance, vehicle-pedestrian distance, etc., with the aim of achieving Level 4 in mixed traffic space.” Led by the University of Tokyo, efforts toward the realization of unmanned autonomous driving have begun.

Promoting study and verification of cooperative ITS infrastructure

Long-term public road demonstration testing of self-driving buses has been conducted in Kashiwa-no-ha Smart City. City roads have been equipped with sensors that detect vehicles and people, and with cooperative ITS infrastructure systems such as roadside V2X communication equipment units. Research and development of cooperative ITS infrastructure technologies continue to make progress toward practical deployment in society.



*Image is for illustration purposes only.



Mobility

Advanced automated driving systems born in Kashiwa-no-ha.

Startup × Kashiwa-no-ha Smart City

Public transportation pioneer Advanced Mobility Co., Ltd.

Possessing the two keys to realizing large-scale autonomous vehicles: precision location technology (GPS, magnetic markers) and obstacle recognition technology (LiDAR, camera image processing), Advanced Mobility Co., Ltd. has been entrusted with a government-initiated automated driving demonstration project. A system developed by Advanced Mobility installed in the self-driving bus is being tested in Kashiwa-no-ha Smart City.



Autonomous EV “Player” TURING Co., Ltd.

With offices in “KOIL TERRACE” overlooking the Aqua Terrace, TURING Co., Ltd., is adopting a unique approach to development of a Level-5 fully automated driving system with the eventual aim of developing and marketing autonomously driven vehicles. The company has started running tests of automated driving systems and collecting running data at the KOIL MOBILITY FIELD facility and in the vicinity of Kashiwa-no-ha Campus Station.



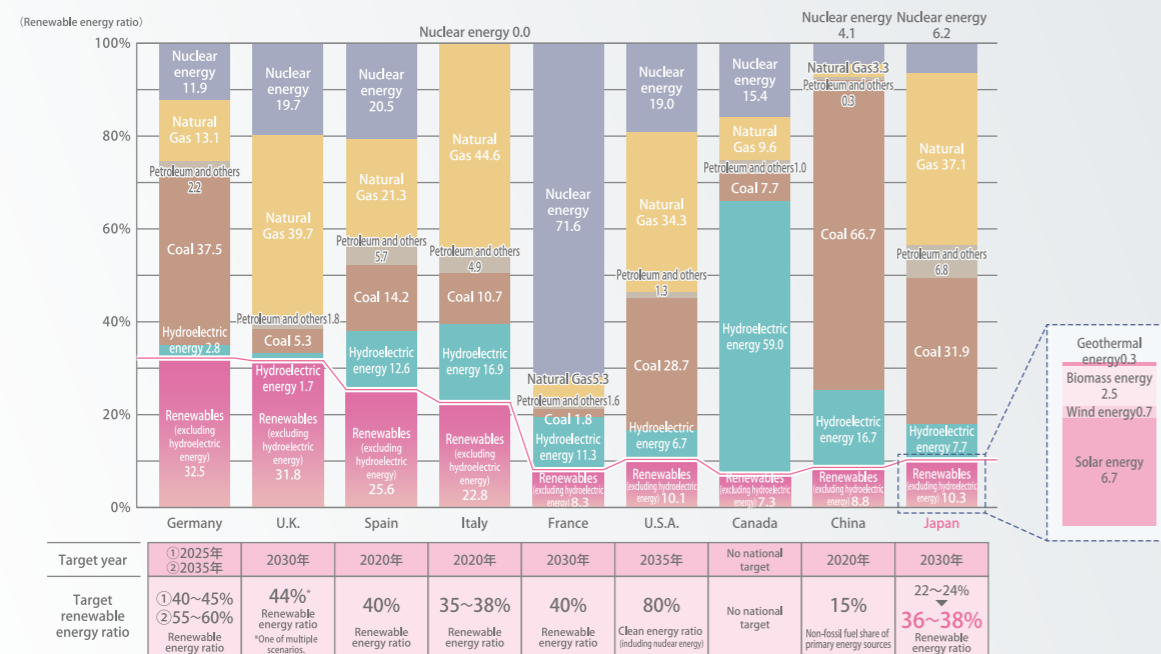


Vision for the future of energy

Infrastructure to pave the way for the age of renewable energy.

Japan's renewable energy power ratio is about 18%. While ratios currently exceed 30% in Europe and the United States, nations on these continents are aiming for even higher levels. Japan too has raised its 2030 target ratio for renewable electricity from 22-24% to 36-38% and for GHG reduction to 46%. In the future, Japan must consider new ways to generate and utilize electric power. Case study models of these innovations will come from Kashiwa-no-ha Smart City. This city is a field for demonstration of next-generation technologies and testing the diversity of their possibilities. Working on the three themes: "Energy Creation", "Power Stabilization", and "General Utilization of Green Power", key "players" possessing advanced technologies and know-how have already gathered in this city to shape the future.

Renewable energy ratios in major countries (Source: Japan data, FY2019 and data for other countries, FY 2018)



Source: Agency for Natural Resource and Energy, METI website

Co-creation themes

Energy creation	Power stabilization	General usage of "Green Power"
<ul style="list-style-type: none"> Solar power generation Wind power generation Biomass power generation 	<ul style="list-style-type: none"> Utilization of momentary power failure storage battery Utilization of emergency power generators Power aggregator 	<ul style="list-style-type: none"> EV introduction/deployment in the private sector EV charger stations

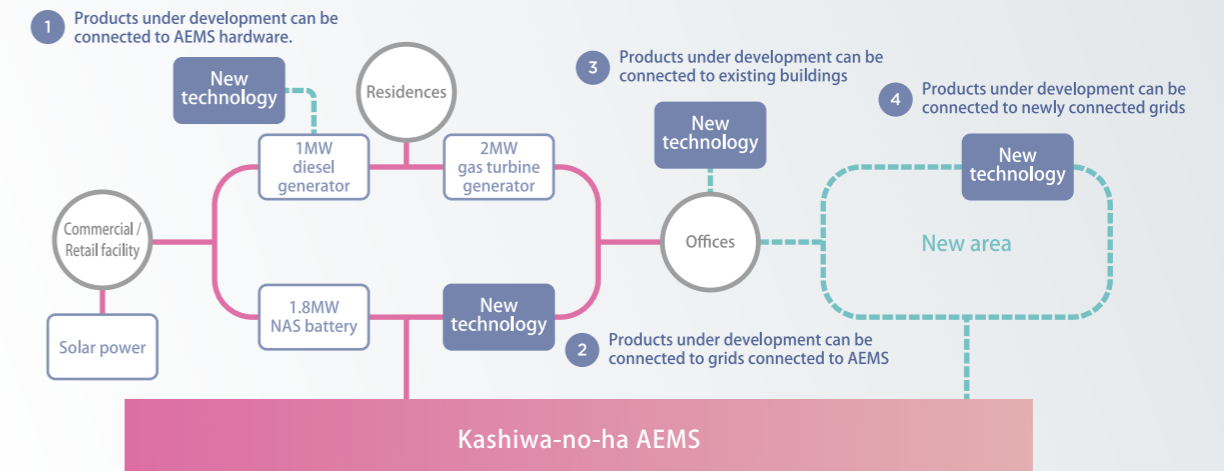
Co-creation environment KOIL Energy Field

Kashiwa-no-ha AEMS (Area Energy Management System)

Conceived to meet two objectives: energy saving and BCP (disaster resilience), AEMS started operation in 2014. It is the first AEMS in Japan to share electricity across district boundaries and centrally manage regional energy.

Next-generation demonstration environment

Kashiwa-no-ha AEMS is an initiative open to participation and connection by energy-related companies. For example, AEMS can be expanded by connecting technologies and products under development to the existing hardware, power grids, and buildings in the system. Also new grids in new areas can be connected to the system. In this environment where megawatt-class distributed power resources are necessary for full-scale endeavors, Kashiwa-no-ha City serves as a stage for experimentation and demonstration of next-generation of solutions for the era of renewable energy.



Energy

On the path to renewable energy stability at "Kashiwa-no-ha AEMS".

Exergy Power Systems × Kashiwa-no-ha AEMS

Solutions to global challenges.

Electric power supply instability is expected to rise in response to the increase in the renewable energy ratio. Kashiwa-no-ha AEMS is answering the challenge with the unique approach of utilizing high-output, power-type storage batteries featuring continuous rapid charging/discharging performance supported by a power adjustment service to balance power supply and demand.

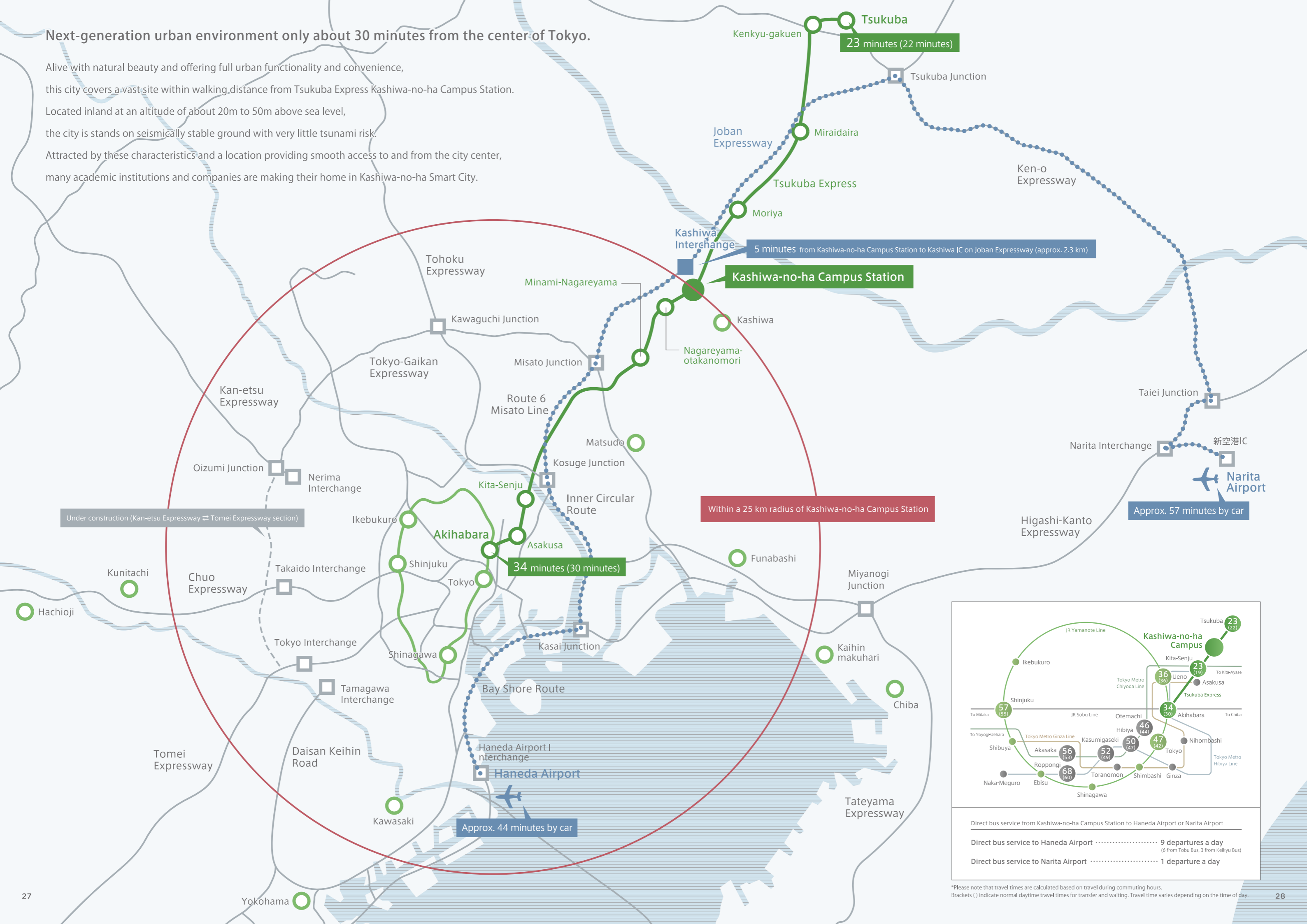


"Kashiwa-no-ha AEMS", a showcase of new technology

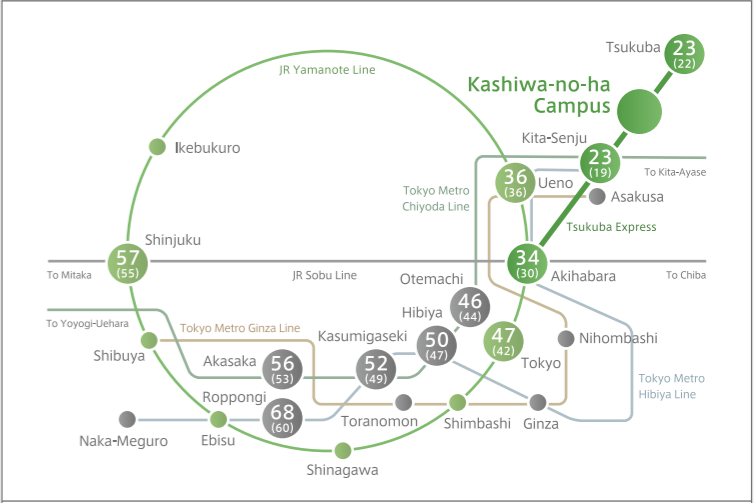
On the occasion of the AEA (Asia Entrepreneurship Awards) 2019, Kashiwa-no-ha Smart City launched demonstration trials of the innovative AEMS. One aim was the demonstration of a power supply system that functions as a backup power source in the event of an emergency by replacing the system's conventional lithium-ion storage batteries with the originally developed Exergy Battery®.

Next-generation urban environment only about 30 minutes from the center of Tokyo.

Alive with natural beauty and offering full urban functionality and convenience, this city covers a vast site within walking distance from Tsukuba Express Kashiwa-no-ha Campus Station. Located inland at an altitude of about 20m to 50m above sea level, the city stands on seismically stable ground with very little tsunami risk. Attracted by these characteristics and a location providing smooth access to and from the city center, many academic institutions and companies are making their home in Kashiwa-no-ha Smart City.



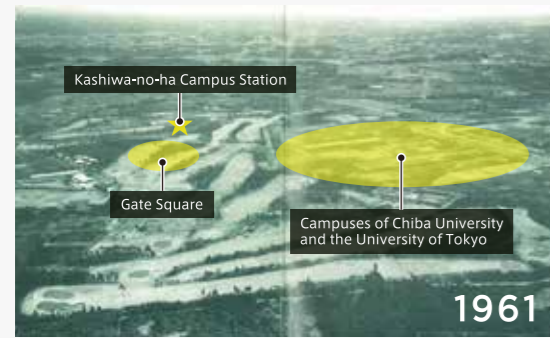
Within a 25 km radius of Kashiwa-no-ha Campus Station



Direct bus service from Kashiwa-no-ha Campus Station to Haneda Airport or Narita Airport	
Direct bus service to Haneda Airport	9 departures a day (6 from Tobu Bus, 3 from Keiikyu Bus)
Direct bus service to Narita Airport	1 departure a day

*Please note that travel times are calculated based on travel during commuting hours. Brackets () indicate normal daytime travel times for transfer and waiting. Travel time varies depending on the time of day.

In the Edo period, the land that is now the site of Kashiwa-no-ha was originally used by the shogunate for raising livestock, but was subsequently settled and cultivated during the Meiji era. Later after serving as home to the Kashiwa Army Airfield and then a communication base of the U.S. Air Force, the Kashiwa Golf Club opened in 1961. Together with the dawn of a new millennium in 2000 and opening of a new chapter in the area's story, the founding and development of a new town in the Kashiwa-no-ha area finally began in earnest. In the over two decades since then, the city evolved to a such a degree that attracted global attention. Together with the many global "players" who have congregated in this community, "Kashiwa-no-ha Smart City" continues to pursue the realization of a vision for the world "future image of the world". With every year, the promise and possibilities of this city keep expanding.



KASHIWA-NO-HA SMART CITY 2022