For the future—A town with comfortable living, working, and childcare environments

Kashiwa-no-ha Smart City: An Advanced Model for Meeting Social Challenges
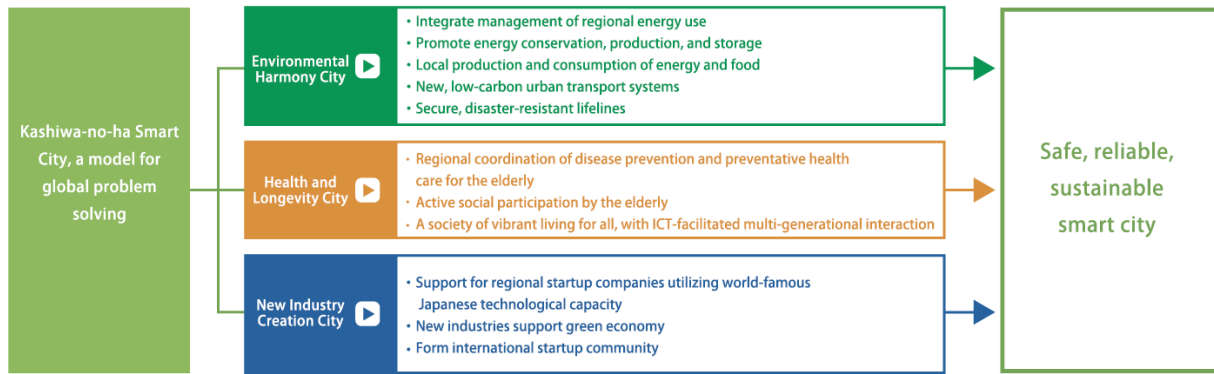
Kashiwa-no-ha Smart City

A Neighborhood Suitable as a Model For a Sustainable Global Future, Structured Through Collaboration Between the Public, Private, and Academic Sectors

3 GOOD HEALTH AND WELL-BEING   **7** AFFORDABLE AND CLEAN ENERGY   **11** SUSTAINABLE CITIES AND COMMUNITIES   **12** RESPONSIBLE CONSUMPTION AND PRODUCTION   **17** PARTNERSHIPS FOR THE GOALS

The Mitsui Fudosan Group is positioning the concept of model smart cities as a response to a wide range of social challenges, including environmental challenges, a super-aging society, and economic stagnation. We are promoting the development of next-generation neighborhoods with participation from the public, private, and academic sectors. Kashiwa-no-ha Smart City, in Kashiwa City, Chiba prefecture, is adjacent to Kashiwanoha-campus Station on the Tsukuba Express line. The project saw its full-scale launch in 2011 and offers three models for social problem solution: Environmental Harmony City, Health and Longevity City, and New Industry Creation City. These models are structured as flat platforms open to anyone wishing to participate in neighborhood creation, including universities, enterprises, and citizens. Our goal is to achieve independent neighborhood creation to establish an image of a global future, sustainable in both tangible and intangible terms.

Public
Chiba Prefecture, Kashiwa City, NPOs

Public, private, and academic collaboration

Open platforms accelerate problem solving

Private
Enterprises and citizens

Academic
University of Tokyo, Chiba University

Kashiwa-no-ha Smart City, a model for global problem solving		
Environmental Harmony City ▶	• Integrate management of regional energy use • Promote energy conservation, production, and storage • Local production and consumption of energy and food • New, low-carbon urban transport systems • Secure, disaster-resistant lifelines	
Health and Longevity City ▶	• Regional coordination of disease prevention and preventative health care for the elderly • Active social participation by the elderly • A society of vibrant living for all, with ICT-facilitated multi-generational interaction	→ Safe, reliable, sustainable smart city
New Industry Creation City ▶	• Support for regional startup companies utilizing world-famous Japanese technological capacity • New industries support green economy • Form international startup community	

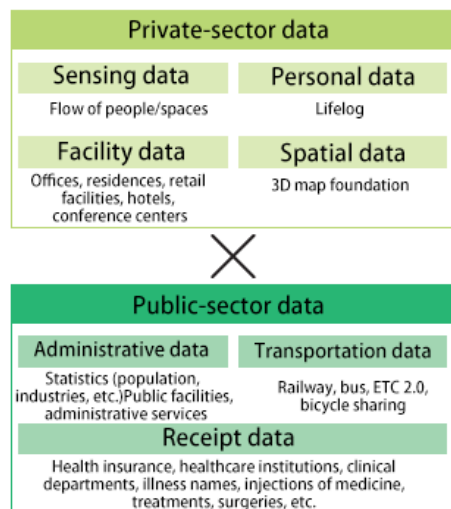**9 INDUSTRY, INNOVATION AND INFRASTRUCTURE**

Public-private Partnerships for a Data-driven Compact City

The Kashiwa-no-ha area, which covers a two-kilometer radius around Kashiwanoha-campus Station, is home to university complexes, hospitals, LaLaport KASHIWANOHA, and other facilities. Kashiwa City, Mitsui Fudosan, and the Urban Design Center Kashiwa-no-ha (UDCK)* have teamed up to form the Kashiwa-no-ha Smart City Consortium for further development of the area. Centered on the station, the area is a hub for people, goods, and information, and the consortium is making use of this attribute to build a platform that brings together data from both the private and public sectors. By incorporating the latest technologies, such as AI and IoT, the consortium is seeking to build a Station-centered Smart Compact City. In 2019, the consortium was selected as an advanced smart city model project by the Ministry of Land, Infrastructure, Transport and Tourism, in line with its pursuit of the so-called Society 5.0.

* UDCK is a hub for neighborhood creation jointly run by seven organizations from the public, private, and academic sectors: University of Tokyo, Chiba University, Kashiwa City, Kashiwa Chamber of Commerce and Industry, Tanaka Region Hometown Council, Metropolitan Intercity Railway Company, and Mitsui Fudosan. Based in the Kashiwa-no-ha district of Kashiwa City in Chiba Prefecture, UDCK undertakes research into city planning, conducts social experiments, supports civic activities, and communicates relevant information to the public sphere.
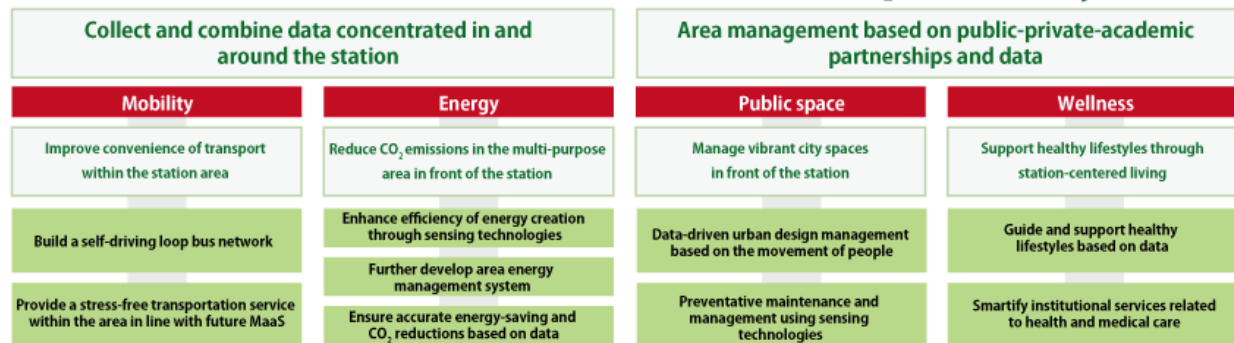
The Kashiwa-no-ha Smart City Consortium is building a public-private data platform that collects private-sector data, such as that related to people, environments, and facilities in the Kashiwanoha area, and public-sector data, collected through various administrative services. Not only will this promote the distribution of decentralized personal data among service-industry businesses, it will enable the creation of a decentralized data management system that returns personal data to the individual. In addition to the analysis and use of public and private data, by incorporating AI, IoT, and other advanced technologies, the consortium is working to uncover new applications and services.

Public-private data platform (decentralized data management system)

Private-sector data

Sensing data	**Personal data**
Flow of people/spaces	Lifelog
Facility data	**Spatial data**
Offices, residences, retail facilities, hotels, conference centers	3D map foundation

Public-sector data

Administrative data	**Transportation data**
Statistics (population, industries, etc.)Public facilities, administrative services	Railway, bus, ETC 2.0, bicycle sharing

Receipt data

Health insurance, healthcare institutions, clinical departments, illness names, injections of medicine, treatments, surgeries, etc.

Goal : Effectively use dispersed key facilities, promote environment and health-based interaction, and achieve self-sufficient city management

Station-centered Smart Compact City

Collect and combine data concentrated in and around the station		Area management based on public-private-academic partnerships and data	
Mobility	**Energy**	**Public space**	**Wellness**
Improve convenience of transport within the station area	Reduce CO$_2$ emissions in the multi-purpose area in front of the station	Manage vibrant city spaces in front of the station	Support healthy lifestyles through station-centered living
Build a self-driving loop bus network	Enhance efficiency of energy creation through sensing technologies	Data-driven urban design management based on the movement of people	Guide and support healthy lifestyles based on data
	Further develop area energy management system		
Provide a stress-free transportation service within the area in line with future MaaS	Ensure accurate energy-saving and CO$_2$ reductions based on data	Preventative maintenance and management using sensing technologies	Smartify institutional services related to health and medical care

Mobility

Introduction of self-driving buses

We have invested in Advanced Smart Mobility Co., Ltd., a start-up from the University of Tokyo that conducts R&D on self-driving systems with a view to commercialization. In fiscal 2019, we began demonstrating and trialing operations of a self-driving bus along a 2.6-kilometer route between Kashiwanoha-campus Station and the University of Tokyo's Kashiwa-no-ha Campus. Looking ahead, we will keep working with Advanced Smart Mobility to carry out R&D and continue trial operations.

Introduction of MaaS

We have signed a collaborative agreement with and invested in MaaS Global Ltd., operator of the world's first real MaaS platform. Following demonstrations with MaaS Global and transportation businesses in the Kashiwa-no-ha area, we will look to make practical use of MaaS from a consumer-oriented, neighborhood creation perspective. We will work to ensure that MaaS creates a more comfortable environment for people living and working in the area, and that it is more than simply a form of transport.

Energy

Introduction of an automatic degradation sensing system for solar panels

We will make use of an IoT-connected maintenance and management platform that, by attaching sensors to each individual solar panel, will enable us to monitor the system's power generation status and automatically detect any dirt or degradation. This will reduce inspection and regular replacement costs, and maximize power generation efficiency.

Building an energy-related data platform for facilities in the area

We will make improvements to existing Advanced Energy Management Systems, and combine energy data, weather data, and human movement data to enhance the accuracy of projected power demand in the area, and thereby optimize our power pooling systems.
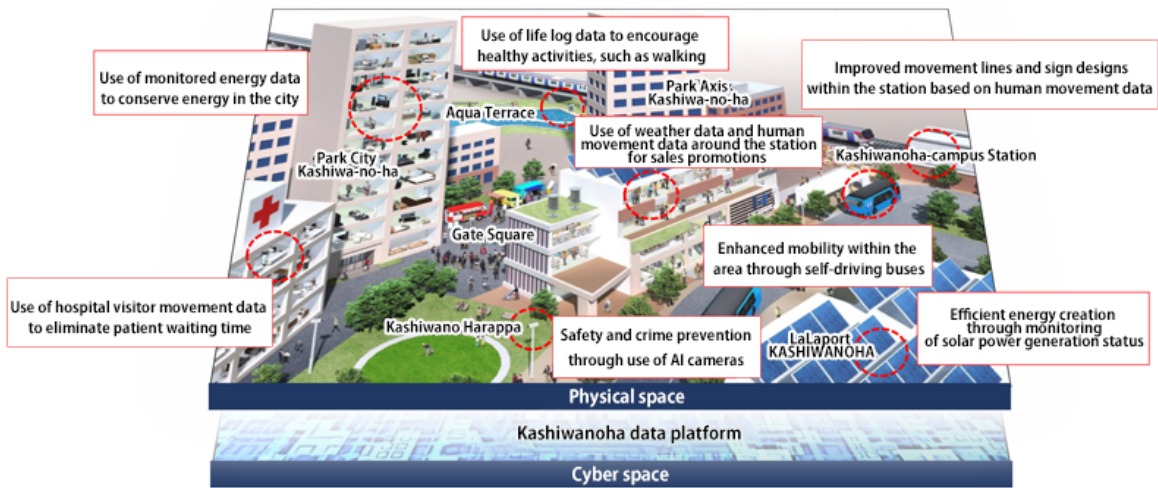
Public space

Monitoring activity and utilizing data through installation of AI camera and sensors

By installing around 30 AI camera near facilities, parks, and other public spaces around the station, we will be able to analyze the flow of people to monitor congestion, and in turn watch over children and elderly citizens.

Preventative maintenance and management using sensing technologies and AI analysis

As part of our efforts towards preventative maintenance and management, we will use sensing technologies to collect, analyze and monitor data on cavities under road surfaces, uneven roads, sewage pipes, and manholes. Central management of this data will allow us to assess risks, estimate causes, and make the necessary repairs in advance.

Wellness

Reducing patient waiting time by utilizing the movement data of hospital visitors

We will use individual recognition tags attached to patients' medical files to automatically record and accumulate information on their position within the hospital. This will enable us to ascertain the most congested locations and times, and we hope this will allow us to reduce waiting time stress and increase the total number of medical examinations.

Providing health and advice services through use of diverse data

Utilizing our network at A-Shi-Ta, a community health promotion laboratory, we will collect the health data and medical care receipt data of patients through their wearable devices and sheet-type pressure sensors, allowing us to offer them optimal health and advice services.

Use of monitored energy data to conserve energy in the city

Use of life log data to encourage healthy activities, such as walking

Park Axis Kashiwa-no-ha

Improved movement lines and sign designs within the station based on human movement data

Aqua Terrace

Park City Kashiwa-no-ha

Use of weather data and human movement data around the station for sales promotions

Kashiwanoha-campus Station

Gate Square

Enhanced mobility within the area through self-driving buses

Use of hospital visitor movement data to eliminate patient waiting time

Kashiwano Harappa

Safety and crime prevention through use of AI cameras

LaLaport KASHIWANOHA

Efficient energy creation through monitoring of solar power generation status

Physical space

Kashiwanoha data platform

Cyber space

Children are the Power that Will Shape the Future.
In a Society of Working Parents, We Create Neighborhoods
Where Children Can Be Raised with Peace of Mind

11 SUSTAINABLE CITIES AND COMMUNITIES

In February 2018, tenants began occupying rental condominiums designed for those raising children, at the large-scale Park City Kashiwa-no-ha Campus The Gate Tower West. The goal was to create residences that help parents address such challenges as extended waiting periods for nursery school admission, and a lack of child-rearing environments designed to support working parents. Along with an on-site nursery school and after-school care facility for elementary school students, the complex features a pediatrics clinic and facilities for ill and convalescing children. The residence will provide an environment that is fully-equipped to enable even working parents to raise children with peace of mind.

Cicol Nursery School and Cicol After School support working parents

Cicol Nursery School is a non-registered entity offering child care services during regular operating hours as well as temporary care and night care until 22:00. Cicol After School is a facility designed for elementary school students and cultivates their capacity to be active in international society.

Parents can work and keep an eye on their children at Cicol Park and Cicol Work

These facilities include Cicol Park, an indoor play land with a wide range of toys for children to enjoy, and Cicol Work, a space where parents can work while monitoring their children.

▶ **Cicol Nursery School**
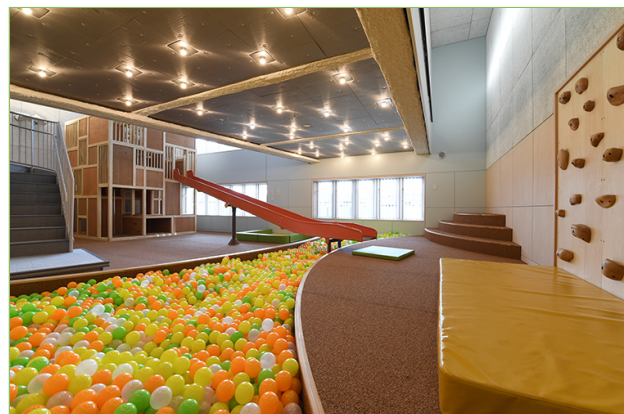
▶ **Cicol Park**

Pediatric care day and night, 365 days a year

Caps Clinic Kashiwanoha offers pediatric medical services day and night, 365 days a year. Ohana Kids Care, located next door, is equipped to care for ill and convalescing children.

▶ **Caps Clinic Kashiwanoha**

Kashiwa-no-ha Campus Clinic is a member of the Sesame Street Pediatric and Dental Education Program from Sesame Workshop, a US non-profit organization.