A Wisdom-Creating City That Pioneers the Future

Outline of the City

The Keihanna Science City (officially known as the Kansai Science City) is nestled in the green Keihanna hills stretching over Kyoto, Osaka, and Nara prefectures in western Japan. The city, which has been constructed and maintained under the Kansai Science City Construction Act, is one of Japan’s national projects—much like the Tsukuba Science City in the east of Japan. Twelve cultural and scientific research districts (about 3,600 ha) scatter the 15,000 ha of land that makes up the Keihanna Science City. The city is about 30 km from the center of both Kyoto and Osaka cities, and about 10 km from the center of Nara City. More than 750 research facilities, including universities and cultural facilities with a total workforce (researchers and other staff) close to 10,000 has accomplished remarkable successes in the fields of cultural and scientific research.

Significance and Philosophy of the City’s Construction

1. Creating a base for new developments in culture, science and research
2. Contributing to the development of culture, science and research in Japan and across the world, as well as to the development of the national economy
3. Foundation of a wisdom-creating city that pioneers the future

As various issues surrounding global human survival begin to arise in this present day in age, we need to pursue even further cultural and scientific studies concentrating on how to make sustainable societies a reality. The Keihanna Science City was constructed as a research space that focuses on subjects such as academia, industrial sectors in the academic, industrial, and governmental sectors in the academic, industrial, and government sectors. 

Features of City Construction

The Active Involvement of the Private Sector

To undergo the development of the Keihanna Science City successfully, the effective collaboration between the citizens and private sectors in the academic, industrial, and governmental sectors is essential. This project uses “private sector vitality” as much as possible by assigning each sector roles and functions that make the best use of their strengths.

The Cluster-type Development

In order to promote the balance of environmentally friendly development among the existing cities and towns, as well as the forest, agricultural, urban, and the natural environment, the Keihanna Science City employed a cluster-type development plan in which 12 cultural and scientific research districts are scattered—much like a cluster of grapes. The city also attempts to unify the entire city by assigning each district urban functions that take advantage of their strengths.

To prevent wasteful investments and unexpected major changes in development plans, we begin working on each district only when they fulfill all necessary conditions for development. This enables us to create a development plan that is as close to the planned development as planned.

Development with a Fusion between Housing and the Cultural and Scientific Facilities

The Keihanna Science City Construction involves the development of the cultural and scientific facilities along with the residential areas. We aim to construct a fascinating city with a remarkable fusion of academic and living environments by taking advantage of the close vicinity of a large city with many residents. In such a city, the collaborative research between institutions and citizens are made possible by asking citizens to participate in scientific studies and demonstrations.

History of City Construction

The construction of the Keihanna Science City was proposed by the “Kansai Science City Surveillance Promotion Conference” (Chairman: Azuma Okuda, former Head of Kyoto University) in 1978. The idea was finalized when the “Kansai Science City Construction Promotion Conference” was established in 1983, by Kyoto, Osaka, and Nara prefectures and economic organizations in the Kansai region. Following the enactment of the Kansai Science City Construction Act in 1987, full-scale construction began as a national project for Japan. More than 30 years have passed since the law came into effect, and about 80 percent of the cultural and scientific research districts are now ready for use. We are currently in the process of moving on to the next step of construction to create a research city with top-level management systems, applying the knowledge and experience we have gathered over the course of our accomplishments with this project.

Organizational Structure for Promoting Urban Development

Kansai Science City Construction Promotion Conference

Established: March 11, 1983
Main Business: (1) Demand activities and public relations activities (2) Attraction of cultural and scientific research facilities, etc.
Chairman: Seiichiro Yamaoka
Representative: Tetsuji Arakawa
Board of Directors: 15 board members appointed by 3 prefectures, related economic organizations, enterprise stakeholders, etc.

Public Foundation of Kansai Research Institute

A Wisdom-Creating City

Kohmura’s refers to the Keihanna Science City. The logo of the city depicts a flying angel known as “Fen,” who scatters flower petals, plays music, and brings sweet happiness while flying in the sky. The gentle curves in the logo represent the softness of the Keihanna Hills and the three patterns symbolize time, accumulated throughout the past, present, and future. The three patterns also represent the cooperation between Kyoto, Osaka, and Nara, and their collaboration between industry, academia, and government.

Structure and Scale of Keihanna Science City (As of April 1, 2019)

<table>
<thead>
<tr>
<th>Name of Science District (Cluster)</th>
<th>Municipalities In/Out</th>
<th>Land Area (ha)</th>
<th>Planned Population</th>
<th>In Service Population</th>
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<tbody>
<tr>
<td>Kyotanabe City</td>
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<th>Prefecture</th>
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<td>3,000,000</td>
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<td>Nara</td>
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<tr>
<td>Kyoto</td>
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Kyotanabe City

Kyotanabe City

Hirakata City

Kizugawa City

Shijonawate City

Kotataha District

Heijo & Soraku District

Nara City

Kiyotaki & Muroike District

Seika Town

Kizugawa Town

Current Population

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THE OUTLINE OF “THE PLAN FOR CREATING NEW CITY”

The Plan For Creating New City ~ The aspect Keihanna Science City aims ~

Keihanna Science City lying across 3 prefectures is about going up to the next stage enhancing city’s presence in the world on featuring the powerful characteristic with lots of integrated parties and their diversity, proceeding construction of new facilities and city development, deepening networks with the relevant districts and parties, and playing the role as the cultural and scientific research town.

Based on this recognition and the purpose creating new city, this plan shows basic ideas about our vision for creating new city. ① Creating city under sustainable high-leveled urban management to activate and to interact our characteristics with various clusters ② Realizing an unexperienced new urban plan

Keihanna Science City’s Conference for creating new city

(established on April 1st, 2016)

In order to create a synergistic network type of management system in accordance with the plan for creating a new city, we established the "Keihanna Science City Conference for creating a new city". The president of the Public Foundation of the Kansai Research Institute was selected as chairman, and the Institute has over 70 members including advisors, committee members (academics and members from national and local government entities, universities, economic organizations, public utilities, support organizations, exchange organizations, and other institutions).

The concrete approaches the conference has taken to share the achievements of a wide variety of stakeholders include the Keihanna Indicator Map, which assesses the city in its entirety from a higher, comprehensive perspective.

4 Challenges to realize our Future Vision

1 Cultivating the intellectual frontier with fusion of science technology and culture

Promotion of cultural and scientific research
- To intensify the role of our city pioneering intellectual frontier through interactive cooperation between universities and research institutes
- To promote platoeistic research on "world future” with cross-cutting cooperation among natural science, humanities and social science
- To enhance the frontier research on eco / energy, population / food / water problems, medical care / brain science for the academic research of sustainable society
- To enrich human resource within coordination among universities, research institutes and companies
- To flourish original Keihanna culture, we cherish to blend culture / academic research / science into the daily life, and to boom education / study program enjoying intellectual learning

2 Motorizing open-innovation to the world

Promotion of innovation
- Based on the open-innovation hub, we newly build up the integrated support system to produce and to direct projects for setting up academic research and innovation strategy, intellectual property, harmonizing the interests among stakeholders, and supporting field demonstrations for the industrialization activating scientific technology
- To strengthen cooperation among Keihanna Open Innovation Center @ Kyoto (KOC) and incubation facilities, universities, and research institutes
- To strengthen the relations with local industries, we generate the network among local associations supporting innovative projects in Kansai for motorizing Kansai
- To enhance the international networking, we diligently invite proper international conferences and seminars interchanging and networking with foreign science parks
- To set up the circumstance accepting residencies, education, job opportunity, employment on promotion inviting foreign schools, research institutes, and companies

3 Promoting the infrastructure for the future generation, producing smart life being ahead of the world

City development
- To nurture new lifestyles (meta-comfortable lifestyle); smart life motorizing eco-system, energy, transportation and innovation with ICT advancing rapidly
- To realize our city’s charm by utilizing historical cultural heritages and nature resources.
- To enhance our city’s diversity, furthermore, we enhance to invite research institute leading the frontier business / academic field, and manufacturers playing the role to work research institutes, and to enrich the function of the conventions supporting interchanging and networking.
- To enforce the extension of the major routes such as Ruten(163), Route Yawata and Central-Yawata Route, to improve access and network to the nation-wide infrastructure such as Shinkansen lines and major highways, Kansai International Airport(106), Kofu, Osaka and Nara.
- To promote the Double Track Project of JR Kishinomura line, Science City line and Nara line and to discuss about extending Kintetsu Keihanna line
- To develop the new transportation system improving mobility such as the ICT future system of the train bus and car-sharing

4 Constructing networking management system generating the synergistic effect

City management
- We produce the new cooperation with every facility joining equally, and with building up networking management system generating multiple effect,
  - Conference for creating new city playing the role of network hub in our city
  - New cooperating system among the above three fields, promoting culture and science, city development and promoting innovation
  - Establishing the system consolidating and transmitting information as the city management center

Keihanna innovation conference
- Comprehensive information-sharing and exchanging among parties on innovation promotion around Keihanna area

City construction task force
- Comprehensive information-sharing, negotiation and coordination to promote city development.

Publication task force
- Information-sharing, networking, planning the PR strategies to promote more effective PR activities by each party

Our Vision for Creating New City

Playing the role as the cultural and scientific research town

Achieving the ideal aspect of the city

Contribution to the world future

Creating new ideas towards peaceful and sustainable coexistence

Creating of wisdom and culture

Enriching the advancement of science and technology in the city, and creating the new cultural and intellectual life that can coexist with the world future
Creation of New Industries from Keihanna Science City

Enterprises in various fields, many kinds of universities and various research institutes are integrated in Keihanna Science City. The objectives of the city are "to lead the knowledge and industries in the world" and "to create innovation sustainably". For the above objectives, we promote creations of new business and industries utilizing cutting edge science and technologies in the city in cooperation with industries, government, universities, and the other science cities. The city also has a wider range of research and industrial areas. The city has strong international network among research institutes, research universities and institutes in the world and strong global communication channels. International interactions among researchers are also very active. We will aim for the creation of new industries from Keihanna in the areas of information and communication, environment and energy, medical and biotechnology utilizing integration of knowledges and the potential of the city for exiting innovation.

Creation of innovations and industrial development

In Keihanna Science City, various institutions and organizations are providing detailed hands-on supports to small and medium sized enterprises and venture companies. They are also promoting industrial development based on the innovative research and development. We are working on the establishment of sustainable innovation schemes based on open innovation such as "RDMM promotion center" (details are described in P06) and the "Keihanna Research Complex" (details are described in P07).

Keihanna Science City

Promotional Organization New Industry Development Exchange Center

Organizations for innovation

Keihanna Science City

Keihanna R&D Innovation Consortium

RDMM Promotion Center

Promotional Organization New Industry Development Exchange Center IDPO

RDMM Promotion Center

Meta-Comfort Smart Society Promotion Office

Keihanna R&D Innovation Consortium

Institution located in the city

Support organizations

National institutions

Regional organizations

Economic organizations

Local governments

Financial institutions

Information and communication

Environment and energy

Medical and biotechnology

Creation of innovations and industrial development

We will aim for the creation of new industries from Keihanna in the areas of information and communication, environment and energy, medical and biotechnology utilizing integration of knowledges and the potential of the city for exiting innovation.

RD&M centers in Japan and overseas

- Research centers in Asia, North America, Europe, etc.
- Tsukuba Science City
- Uemita
- Kobe Biomedical Innovation Cluster

Creating and promoting platforms for joint demonstration, cooperation programs, utilizing the AIJ Platform, a joint project between the Northern Universities to promote innovation, which has already started and is preparing for collaboration in the biomedical and food industries.

Keihanna R&D Innovation Consortium

The aim of the Keihanna R&D Innovation Consortium is the creation of new concepts for business and products through group (WIG) activities in the fields of future marketing and design studies. It provides real options for earlier evaluation of a project, facilitating a newly created concept and platforms for demonstration experiments, taking advantage of its location in Keihanna. With these measures, it promotes industry-academia-government partnerships, cross-industrial cooperation, and utilization of R&D achievements, putting new industries and businesses on the fast track to launching.

New business creation and innovation partnerships with ASEAN and IORA nations

Construction and Utilization of the AIJ Platform

The AIJ Platform provides specific plans and projects for innovative partnerships between research institutes, universities and businesses, with the aim of facilitating the creation of new industries and businesses. The platform is supported by Keihanna Science City, and other Science Cities in ASEAN and IORA nations, which serve as hubs. Utilizing the AIJ Platform, a joint project between the Northern Science Park (NSP) in Thailand and a Kansai company has already started and is preparing for collaboration in the biomedical and food industries.

"AIJ: ASEAN, IORA (Indian Ocean Rim Association) and Japan"

Utilization of Residents’ Creativity

Club Keihanna

Residents have formed this organization as a way to have their opinions reflected in the creation of future industries and new products as well as in the development of their town. Members can express their own opinions about future products and services and participate in discussions.

Utilization of specific district status

Keihanna Public Road Experimental Platform (K-PEP)

K-PEP (Keihanna Public Road Experimental Platform) is the first mutually usable public road experimental platform in Japan with participants of Keihanna residents. RDMN Promotion Center provides one-stop support for demonstration experiments, including the coordination with local residents and administrative agencies such as the police department and local government.
Activity for Sustainable Innovation Part 2 in Keihanna Science City

Global Research Complex project for creation of ‘Meta-Comfort’ smart society via i-Brain×ICT Currently people prefer spiritual richness to having lots of things

At the Keihanna Research Complex we have taken our abundance of i-Brain (brain and human science technologies) research results and advanced ICT (Information Communications Technologies) to promote progress in tackling areas in brain science in which AI is not yet fully understood or utilized. Simultaneously, we focus on social affluence, which grows through peace, vitality, and sympathy, and enact new “meta-comfort” technologies and services, and create the next generation smart city under certain social systems where such innovations are promoted in sustainable manners (calling it as “innovation eco-system”). This program has been adopted as one of the nationwide programs in three regions in Japan, “The World-class R&D and Verification Experiments (Research Complex) Promotion Program implemented by the Japan Science and Technology Agency (JST). With its vision to realize the concept of an ideal community and social values in 5 and 10 years shared by the members of industry, academia, government, and financial institutions, this program was developed to grow and extend the research complex as the foundation for the promotion of innovation to deploy cutting-edge research and development, commercialization of achievements, and human resource development in an integrated and unified manner.

Various Events in Keihanna Science City

Citizen-Researcher Interaction

Lectures open to the public in cooperation with universities

Collaborating with universities in this city, we hold lectures open to the public under the keyword of “knowledge transmission from Keihanna”. Specialized lecturers in these universities explain state-of-the-art research cases in an easy-to-understand way about the area of citizen’s high interest.

Mahoroba - Keihanna SSH [Super Science High School] Science Festival

We hold the festival for junior high school students and high school students in and around the city. It consists of lectures and poster sessions, and at poster sessions, free opinion exchange and discussion with researchers and engineers are held, which creates a precious place for education.

Keihanna Science Cafe

We invite experts who are active in various fields as guest speakers, deepening mutual exchanges among lectures and other participants about topics of cutting-edge science and technology, and aim to create new business by interchange of different industries.

Innovation Mixer in Keihanna

We hold opportunities for exchange of information in a wide range of themes across various industries among employees and researchers of various location facilities such as companies and research institutions located in the city.

Keihanna Information and Communication Fair

Information and telecommunications related organizations located in this city cooperate to introduce state-of-the-art technologies and research achievements in the field of Information and communication by presentation, demonstration and other information.

<Other Efforts>

Keihanna Business Trade Fair

In order to contribute to the creation of new industries and the promotion of regional industries by providing places of collaborating and matching between seeds which small and medium enterprises, venture companies, universities and research institutions with cutting-edge technology located in this city, and industrial needs of various fields, we hold exhibition business meetings.

Kyoto Smart City Expo

We will provide opportunities to connect with new business by establishing a place for domestic and foreign ICT industry related companies, organizations, researchers, etc. to gather and exchange and to receive stimulus from each other. We will also give lectures by AI and IoT experts and introduce actions of developed local governments.

In Keihanna Science City, active exchanges between citizens and researchers, among researchers, etc. are held through various events.
Facilities & Organizations in Keihanna Science City

Public Facilities & Organizations in Keihanna Science City

International Institute for Advanced Studies (IIAS)
The International Institute for Advanced Studies was founded in 1984, since then, we are pursuing a variety of research towards solving the discovery of the various challenges faced by human society. By serving as a core institution of knowledge of the Kansai Science City by presenting new perspectives and directions through various activities including Keihanna "Edison no Kai" aiming to promote open innovation, we will work toward realization of a sustainable society from the relationship with various institutions, administration, university and residents.

Advanced Telecommunications Research Institute International (ATR)
ATR is a research and development institute mainly specialized in the fields of computational neuroscience, life-supporting robots, and wireless communications. Specific research themes include: development of treatment methods for mental disorders using fMRI, and network-based BMI for more self-support of the elderly and people with long-term care.

Advanced IFM based on Data and Artificial Intelligence Working Towards Application of Real-Time Neuro Feedback to Mental Disorder Care
Based on the hypothesis that mental disorders are abnormalities in brain dynamics, we work to quantify brain dynamics using brain function binding patterns (end NF) or multi-view patterns (Decile) as biomarkers and decoders. From this we work to use reinforcement (neuro operant conditioning) to guide the disorder dynamics to healthy dynamics.

Kansai-kan of the National Diet Library
The Kansai-kan is a major research library that supports innovative research at Keihanna Science City by providing access to a wide range of information. The Kansai-kan houses more than 2 million books and 110 thousand periodicals and newspapers published in Japan and around the world. It also archives 3.5 million scientific and technical standards from Japan and around the world; 600 thousand doctoral dissertations from Japanese universities; 170 thousand scientific research reports funded by the Ministry of Education, Culture, Sports, Science and Technology, and a further half million materials in Asian languages other than Japanese. Moreover, on-site users can access a variety of online journals and databases including major newspapers, Web OYA-bunko, D1-Law.com, Ishुしゅ-Web, J-Search, Web of Science, ScienceDirect, EBSCOhost, ProQuest Central, CNN, and KBS.

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Facilities & Organizations in Keihanna Science City

National Institutes for Quantum and Radiological Science and Technology (QST)
Kansai Photon Science Institute
Following the successful development of powerful lasers such as J-KAREN, an ultra-short pulse laser of the world’s top class, we work on academic, medical, and industrial applications for high powered lasers, including development of a compact accelerator for use in particle beam cancer therapy, practical use of remote and non-contact methods to detect defects in concrete using lasers, and a palm-sized non-invasive blood glucose level sensor and more.

VoiceTra
Network-based multilingual speech translation system for smartphones

WEKDA
A next-generation conversation system that allows users to talk about various subjects and topics based on knowledge provided by WISDOM X, NICT’s large-scale web information analysis system. By utilizing deep learning AI, we can provide valuable information to users through natural dialogue.

Research Institute of Innovative Technology for the Earth (RITE)
We conduct research and development activities of innovative energy and environmental technologies as a center of excellence on the mitigation of global warming. Our focus areas are CCS technology, which captures CO2 from large emission sources such as electric power plants and factories and stores it in an underground aquifer, bioenergy technology to produce biofuels and green chemicals from non-food biomass, systematic study regarding policies and measures to mitigate global warming through the analysis and the evaluation of various countermeasures, and inorganic membranes to be applied for dehydrogenating process which is essential for realizing hydrogen society.

World Class Ultra-Short Pulse Ultra-High Intensity Laser J-KAREN

At Keihanna Science City, advanced research and development in various fields such as environment/energy, information communication (ICT), bioscience, optical science, nanoscience, are being conducted, and various manufacturing companies ranging from the world’s leading large enterprises to medium-sized and venture companies are active for creation of products and services based on advanced technology and innovation of manufacturing.
RIKEN Research in Keihanna Science City

RIKEN, a national research and development institute, is Japan’s flagship research institute in the natural sciences. It is committed to helping maintain Japan’s industrial development in response to social and national needs. As one of the pillars of the RIKEN Initiative for Scientific Excellence, our presence in Keihanna Science City is part of a wider effort to strengthen our ability to achieve world-class research outcomes. Here, RIKEN research teams have collaborated with other research institutions to develop bases for research activities. These bases function as science and technology hubs that produce innovation through collaborations with academia and industry, pushing research forward toward excellent results.

RIKEN Research in Keihanna Science City

RIKEN BioResource Research Center (BRC)

At RIKEN BRC, disease-specific iPS cells established from patients with various diseases are provided as biosources. By utilizing disease-specific iPS cells, the reproduction of disease pathology is a culture dish, accelerated exploration of disease mechanisms, and development of drug discoveries are expected.

FSC-based Drug Discovery and Development Team

The team develops basic technologies for FSC drug discovery and development, such as pattern recognition, machine learning, and AI and deep learning technologies. The team also studies cancer cells and other information analytics through analyses of big data obtained by IoT-based sensing and everyday multi-sensor data and brain information. This team develops pathomechanism technology, biomarker technology, and new drug screening technology.

RIKEN Center for Advanced Intelligence Project (AIP)

This team develops big data analysis and dynamic modeling technologies of human brain imaging data such as MRI, EEG, and fMRI in order to realize novel human imaging-based research methods for clinical diagnosis and brain stimulation.

Advanced Telecommunications Research Institute International (ATR)

The team develops AI technology and robotic technology that can be applied to embedded systems, including computer vision and machine learning and robot intelligence.

Robotics Project, RIKEN Baton Zone Program

The team aims to develop a comprehensive platform to build an ethical foundation for continued coexistence with technology. The team is working on digital technologies and symbolics, among things, machines, and artificial intelligence.