

New Industry Creation Hatchery Center



**NICHE**

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## NICHe's Missions

NICHe is one of the inter-Department institutes for education and research in Tohoku University. Our Mission is to respond to the needs of society by creating new technologies and products as well as by exploring new uses and industries. Original and cutting edge research is carried out in collaboration with industry.

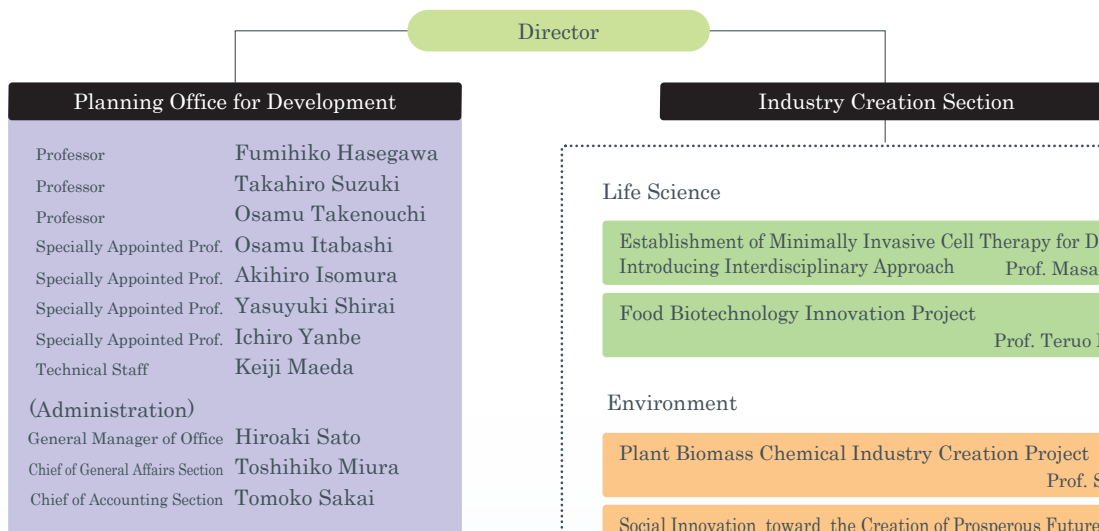
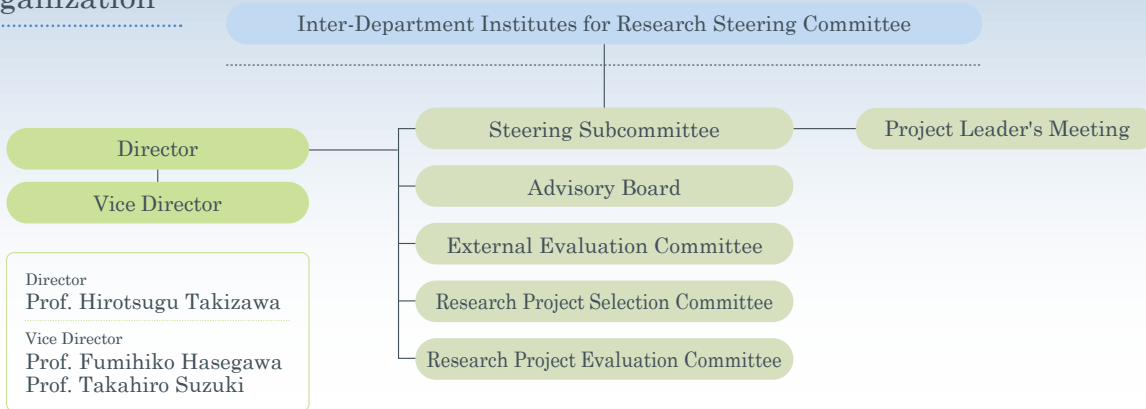
NICHe is the research center providing solutions for the problems on industry and society by corporative research projects based on our universities potential.



## History of NICHe

Organizations and Facilities on TOHOKU University	Year	New Acts in JAPAN
New Industry Creation Hatchery Center (NICHe) Tohoku Techno Arch	1998	Act on Technology Transfer Promotion (TLO Act) (The Promotion of Technology Transfer from Universities to Private Business Operators)
	1999	Act on Industrial Revitalization (Japanese Version of the Bayh-Dole Act)
NICHe Main Building	2000	Industry Technology Enhancement Act (Deregulation on Side Job: Academic Discounts on Patent Fees)
	2001	Reorganization of the Central Government Ministries and Agencies
Fluctuation Free Facility for New Information Industry Hatchery Square	2002	
	2004	Incorporation of National Universities
Business Incubator, T-Biz *A Facility of Organization for Small & Medium Enterprises and Regional Innovation, JAPAN	2007	
NICHe Annex	2010	
Miyagi Reconstruction Park (in October) *Research Center for the NICHe Next-Generation Mobility System Project	2011	Great East Japan Earthquake

## Organization



### Nanotechnology and Materials

- Innovative Development of Supercritical Processes  
Prof. Tadafumi Adschiri
- Creation of Atom-Endohedral Fullerene Nanobionics  
Prof. Toshiro Kaneko
- Ultra-low Friction Technology Area  
Prof. Kazue Kurihara
- Research and Development of Sensor Network for Safety and Security  
Prof. Hiroki Kuwano
- Research and Development of Interconnection Materials and Processes for Advanced Electronic Devices  
Prof. Junichi Koike
- Ageing Degradation Evaluation & Condition Monitoring (ADECOM)  
Prof. Tetsuo Shoji
- Development and Practical Application of Ball SAW Sensor  
Prof. Kazushi Yamanaka
- Development of Novel Functional Crystals and Their Devices  
Prof. Akira Yoshikawa

### Life Science

- Establishment of Minimally Invasive Cell Therapy for Diabetes by Introducing Interdisciplinary Approach  
Prof. Masafumi Goto
- Food Biotechnology Innovation Project  
Prof. Teruo Miyazawa

### Environment

- Plant Biomass Chemical Industry Creation Project  
Prof. Shuichi Oi
- Social Innovation toward the Creation of Prosperous Future Society in the Efficient Use of Water Infrastructure  
Prof. Tatsuo Omura
- Development of Column Support System for Steel Moment Resisting Structures to Perform Beam Yielding Mechanism  
Prof. Yoshihiro Kimura
- Collaborative Research for the Frontiers of Manufacturing Technology Based on Material Science  
Prof. Tsunemoto Kuriyagawa
- Field Robotics Project for Unmanned Surveillance  
Associate Prof. Keiji Nagatani
- Next Generation Advanced Mobility System Project  
Prof. Hidetoshi Matsuki
- Experiments Integrated Multiscale, Multiphysics Computational Chemistry  
Prof. Akira Miyamoto

### Information and Communication

- Digital Content Creation, Understanding & Distribution  
Associate Prof. Terumasa Aoki
- Development of High-Performance and Low-Power Three-Dimensional LSI's  
Prof. Mitsumasa Koyanagi
- Advanced Semiconductor Sensor and Devices  
Prof. Shigetoshi Sugawa
- Research and Development of the Electric Wave Environment Improvement Technology  
Prof. Masahiro Yamaguchi
- Highly Functional Semiconductor Lasers and Their Application for Nanoimaging  
Prof. Hiroyuki Yokoyama

# The List of NICHe Projects

Life Science Environment Information and Communication  
 Nanotechnology Special Project

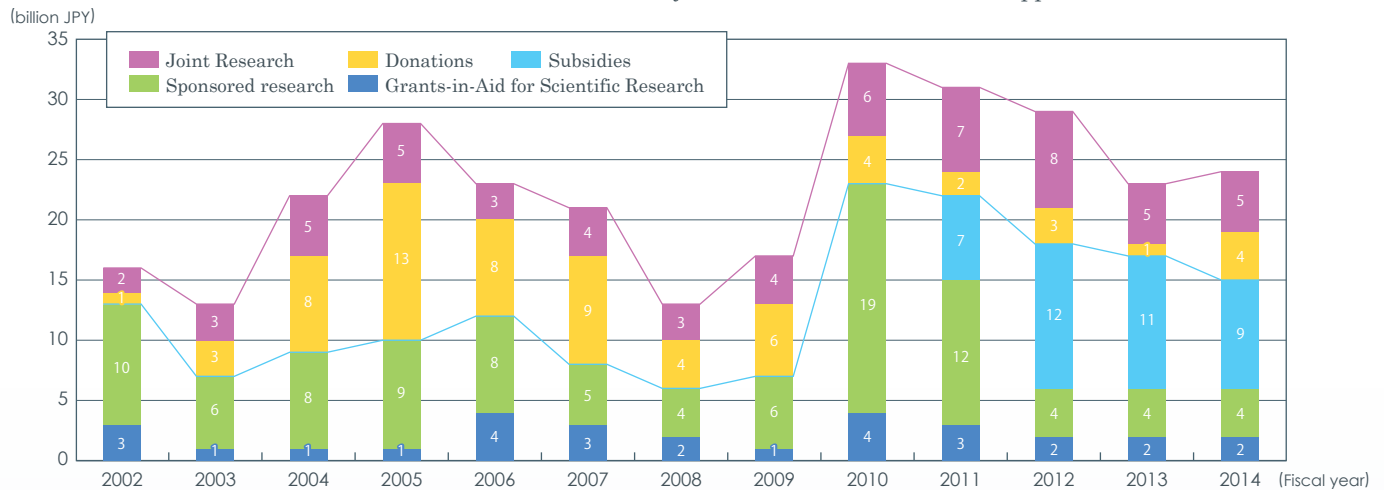
Project Leader / Fiscal year	'98	'99	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15
Prof. Akihisa Inoue	■	■	■	■														
Prof. Tsutomu Yamashita	■	■	■	■														
Prof. Tadahiro Ohmi	■	■	■	■	■	■	■											
Prof. Tadahiro Ohmi								■	■	■	■	■	■					
Prof. Shigetoshi Sugawa															■	■	■	
Prof. Shigetoshi Sugawa																		■ ~18.3.31
Prof. Masayoshi Esashi	■	■	■	■	■	■	■											
Prof. Motohiko Yamada	■	■	■	■	■													
Prof. Kiyohito Ishida	■	■	■	■	■	■	■											
Prof. Isamu Uchida	■	■	■	■	■													
Prof. Yasunobu Handa		■	■	■	■	■												
Prof. Tetsuya Terasaki		■	■	■	■	■	■	■										
Prof. Ryuta Kawashima				■	■	■	■	■	■									
Prof. Shojiro Kawakami			■	■	■	■												
Prof. Akira Miyamoto					■	■	■	■	■									
Prof. Akira Miyamoto									■	■	■	■	■					
Prof. Akira Miyamoto															■	■	■	■ ~17.3.31
Prof. Migaku Takahashi					■	■	■	■	■	■	■							
Prof. Migaku Takahashi												■	■	■	■	■	■	
Prof. Yasushi Uematsu					■	■	■	■	■									
Prof. Hiroyuki Yokoyama					■	■	■	■	■									
Prof. Hiroyuki Yokoyama											■	■						
Prof. Hiroyuki Yokoyama													■	■	■	■	■	■
Prof. Masahiro Kohno					■	■	■	■	■	■	■	■						
Prof. Kingo Itaya					■	■	■	■										
Prof. Masayoshi Ichie					■	■	■	■	■	■	■							
Prof. Tatsuo Uchida							■	■	■	■	■							
Prof. Tatsuo Uchida									■	■	■							
Prof. Tatsuo Uchida												■	■	■				
Prof. Tatsuo Uchida															■	■	■	
Prof. Kazushi Yamanaka								■	■	■	■	■	■	■				
Prof. Kazushi Yamanaka																	■	■ ~17.3.31
Prof. Masaharu Kitamura									■	■	■	■	■	■				
Prof. Keietsu Abe									■	■	■	■	■	■				
Prof. Teruo Miyazawa																■	■	■
Prof. Makoto Watanabe									■	■								
Prof. Satoshi Tadokoro									■	■	■	■	■	■				
Prof. Tadafumi Adschiri								'06.8.1~	■	■	■	■	■	■				
Prof. Tadafumi Adschiri																■	■	■ ~18.3.31
Prof. Akihisa Inoue									■	■	■							
Prof. Satoshi Sugimoto										■	■	■	■	■				
Prof. Takashi Nakamura										■	■	■	■	■	■			
Prof. Akira Yoshikawa										■	■	■	■	■				
Prof. Akira Yoshikawa															■	■	■	■
Assistant Prof. Hiroyasu Sato										■	■	■						
Prof. Kunio Sawaya												'10.7.1~	■	■	■	■	■	
Prof. Yasuaki Kohama												■	■	■	■	■		
Prof. Tetsuo Shoji												■	■	■	■	■		
Prof. Tetsuo Shoji																	■	■ ~18.3.31
Prof. Kazuhiro Kosuge												■	■	■	■			
Prof. Mitsumasa Koyanagi													■	■	■	■	■	■ ~17.3.31
Prof. Masahiro Yamaguchi																		
Prof. Masahiro Yamaguchi																'15.8.1~	■	■ ~17.3.31
Associate Prof. Terumasa Aoki												'10.10.1~	■	■	■	■	■	■
Prof. Masafumi Goto												'10.11.1~	■	■	■	■	■	■
Prof. Masaru Uchiyama												'11.2.1~	■	■	■	■	■	■
Prof. Junichi Koike															■	■	■	■
Prof. Yoshihiro Kimura															■	■	■	■ ~17.3.31
Prof. Kazue Kurihara															■	■	■	■ ~17.3.31
Prof. Hirotsugu Takizawa																■	■	■
Prof. Hiroki Kuwano																■	■	■ ~20.3.31
Prof. Tatsuo Omura																	■	■ ~17.3.31
Associate Prof. Keiji Nagatani																		■ ~20.3.31
Prof. Shuichi Oi																		■ ~20.3.31
Prof. Toshiro Kaneko																	'15.10.1~	■ ~18.3.31
Number of projects	7	9	10	11	11	13	13	13	18	19	17	18	23	22	22	21	20	22

## Number of projects

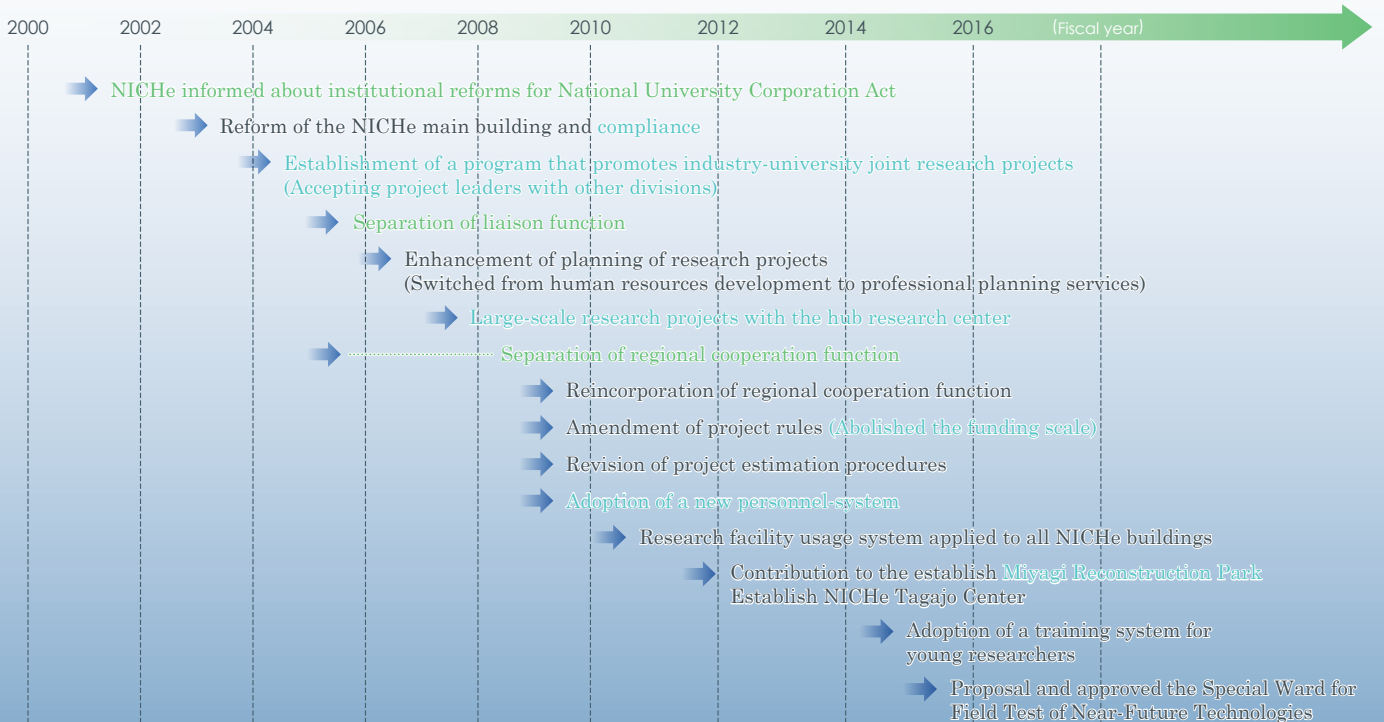


## Research Funds

### Research Funds Obtained from External Sources (University's Grants-in-Aid Account for Approx.5%)



## History of NICHe



# Special Ward for Field Test of Near-Future Technology

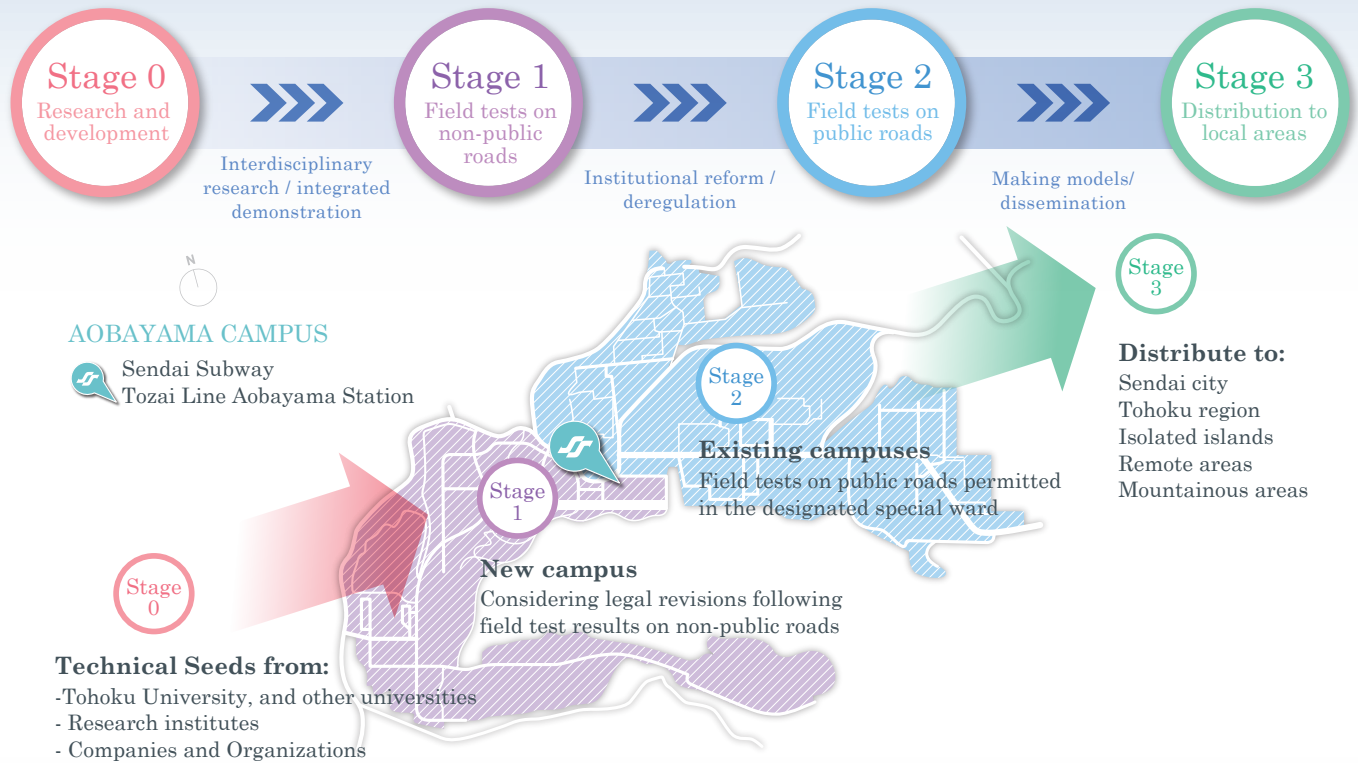
## Aobayama New Campus Vision

Showcase of cutting-edge technologies on Aobayama campus.

## Aobayama Smart Transport Systems

Concept of the Special Ward for Field Test of Near-Future Technology

Designated by the national government as the Sendai City 'Social Innovation Creation Special Ward', one of the special zones for regional revitalization (national strategic special zone) (2015)



# Establishment and use of Miyagi Reconstruction Park

Operational body : Miyagi Organization For Industry Promotion (Public Interest Incorporated Foundation)  
 Foundation : October 2011  
 Address : Sony Corporation Sendai Technology Center, 3-4-1 Sakuragi, Tagajo City, Miyagi Prefecture  
 Facility scale : Seven buildings / Approximately 39,000 m<sup>2</sup>  
 Outline : Sony Corporation Sendai Technology Center offered some of its facilities that had suffered flooding damage caused by the Great East Japan Earthquake and had then been left unused due to the corporation's downsizing free of charge for 10 years. Miyagi Reconstruction Park is one of the largest incubation centers in Asia, making full use of the excellent infrastructure of the industrial giant.

## Tohoku University NICHE

### NICHE Next-Generation Advanced Mobility System Project



Non-contact type EV power station



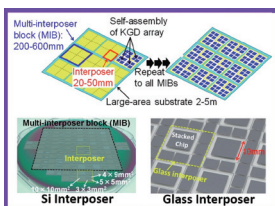
Driving simulator



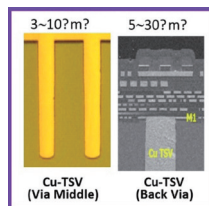
Compact EV, Electric bus



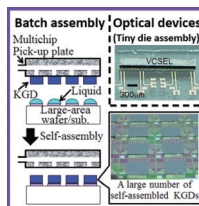
### Development of High-Performance and Low-Power Three-Dimensional LSIs



Large area interposer



Through-Silicon Via (TSV) process

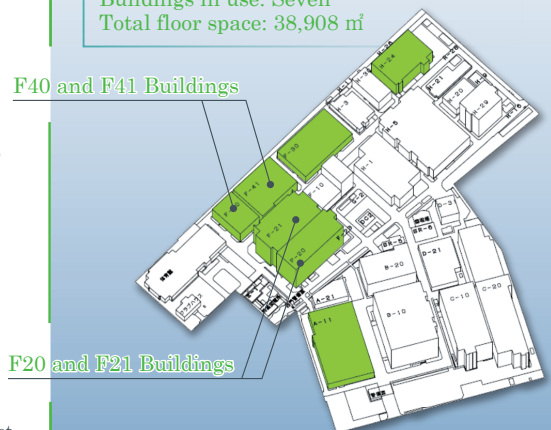


Highly accurate chip self-assembly using liquid droplet

## Miyagi Reconstruction Park

(Currently 28 entities in operation)

Buildings in use: Seven  
 Total floor space: 38,908 m<sup>2</sup>



Sony Corporation Sendai Technology Center



## Facilities and Access

NICHe has four research buildings in Aobayama Campus of Tohoku University.



### New Industry Creation Hatchery Center (NICHe), Main Building

#### ■ Outline ■

The main building, built for industry-university joint research, has six-stories with gross internal area of 4,600 m<sup>2</sup>. The first floor is allocated to the Planning and Development Division and the administration. The second to the sixth floors are allocated to research projects. Entry to and exit from each floor are monitored 24 hours to secure research confidentiality.

#### ■ Features ■

Geothermal heat pump system is installed for CO<sub>2</sub> emission reduction and energy saving



### "Fluctuation Free Facility" for New Information Industry

#### ■ Outline ■

This facility, most advanced Clean Rooms for Innovative Semiconductor Manufacturing System, was built by contribution from semiconductor industry collaborating the Project on the Creation of New Semiconductors to bring about a revolutionary breakthrough to the industry. It is six-storied building with 6400 m<sup>2</sup> floor.

#### ■ Features ■

In addition to thorough energy saving, detecting of contamination and monitoring power-supply voltage fluctuation and micro vibration enable to control strictly any contamination, fluctuation, or variation. This facility is available for use from planning, designing and manufacturing for the conducting of tests in a consistent manner.

There are two clean rooms (605 m<sup>2</sup> and 692 m<sup>2</sup>) on the third and fourth floors. Professors and IP staff rooms are allocated on the fifth floor, the six floor for research stuff, designing and measuring instruments.



### New Industry Creation Hatchery Center (NICHe), Annex

#### ■ Outline ■

This facility was constructed by grant from the Ministry of Economy, Trade and Industry under the title of the "2008 Grant for Public Facilities for Promoting the Attraction of Enterprises to Regions." To put research outcomes to practical use within a short period, researchers from the university are engaged in research activities jointly with those from large companies and small and medium-sized enterprises (SMEs), especially from domestic SMEs aiming to be global niche players.

#### ■ Features ■

To conduct large-scale research activities, each floor (446 m<sup>2</sup> for research spaces) has no partitions. Partitions can be erected when required. Entry and exit management is thoroughly maintained by keeping record to ensure confidentiality and to avoid unauthorized entry or contamination of research information. (Five-storied building with total area of approx. 3,500 m<sup>2</sup>)



### Hatchery Square

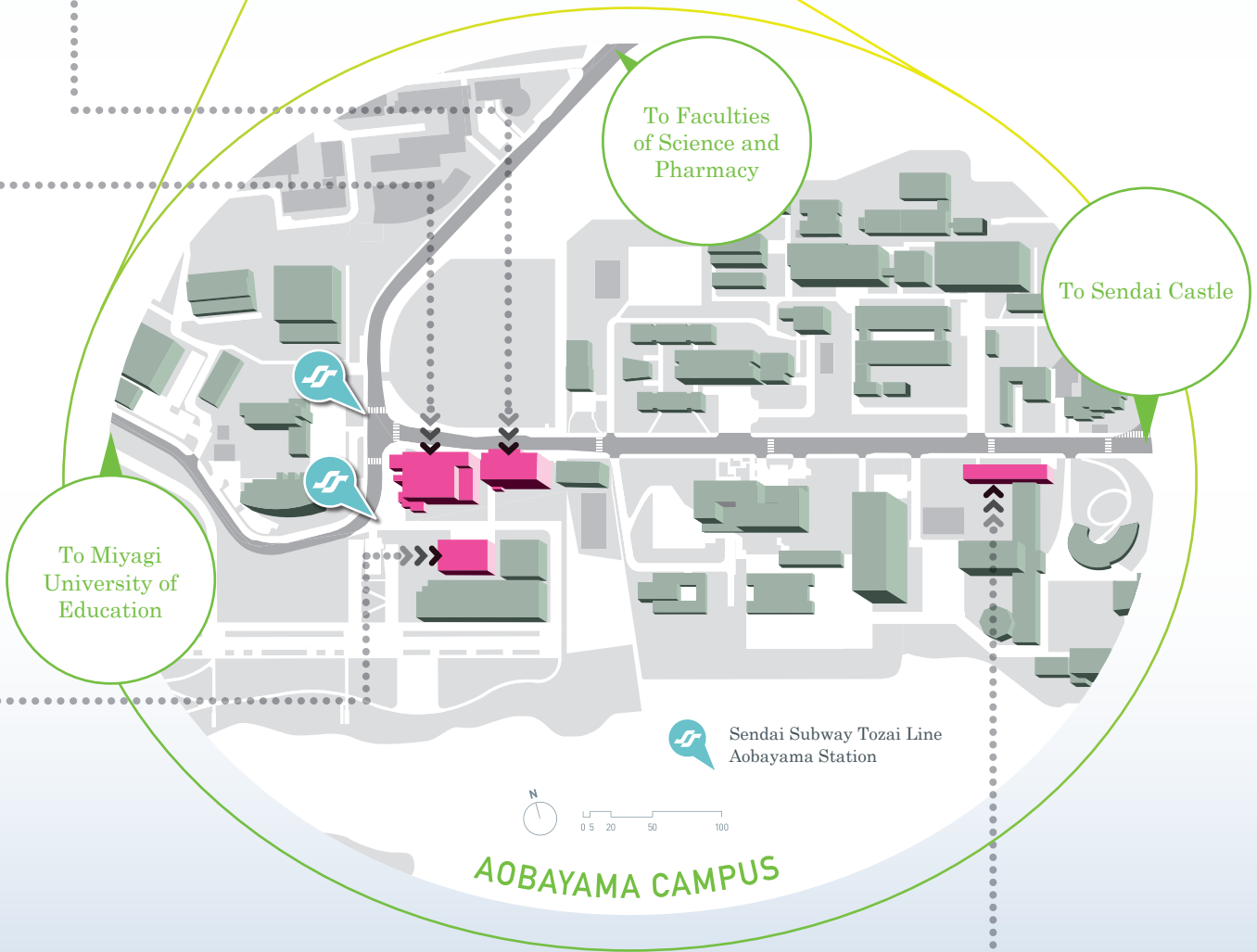
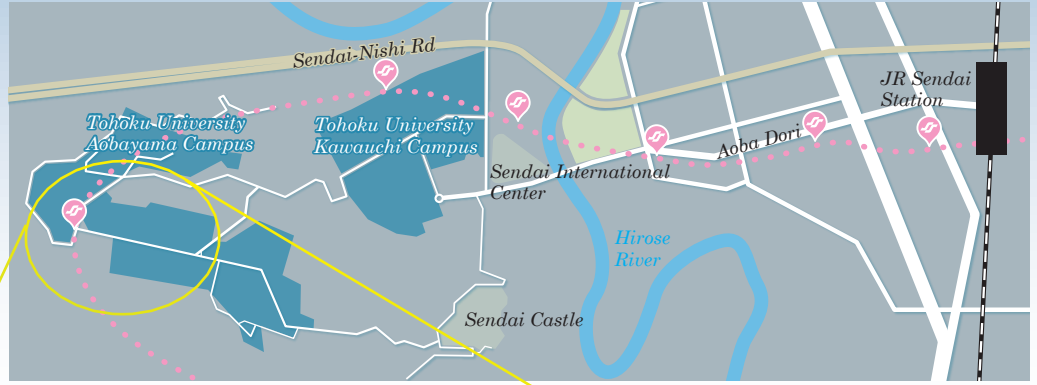
#### ■ Outline ■

Hatchery Square was opened in September 2002 as an incubator of research projects that specialize in the development of ventures on the base of research results. Creating university-originated ventures is the main objective of the facility.

#### ■ Features ■

This steel-framed building is two-storied with an area of approximately 1,000 m<sup>2</sup>, accommodating R&D offices, meeting rooms and common space. The meeting rooms and common space are available for use around the clock as common rooms for tenants. Since the facility is open 24 hours, ID card is required for entry to and exit from the doorway and each office room to take security into full consideration.





 **Subway Tozai Line**

From "Sendai" station, take the Subway bound to "Yagiyama Zoological Park".  
Get off at "Aobayama" station.  
Time / 9 minutes, Fare / 250 yen.

 **Taxi**

You may take a taxi to NICHe from Sendai Station.  
Time / 20 minutes, Fare / 1,700 yen approx.



<http://www.niche.tohoku.ac.jp>

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