

# Chitose Future Vision – Summary –



## Background and Objectives of Formulating the Chitose Future Vision

- Since the location of Rapidus in our city may have a significant impact on community development, we have formulated this Vision in the belief that it is necessary to present the direction of community development in an easy-to-understand manner based on the results of studies of this impact, changes in the city, etc.

## Approach to Formulation of the Chitose Future Vision

- This Vision provides a picture of what the City should aim for in its future development and sets the direction for future city planning.
- Based on this Vision, we will review the 7th Comprehensive Plan, the city's top-level plan, and individual plans as necessary, and promote initiatives to sustain development into the future.

## Composition of the Summary Edition

- The composition of the summary version of the Chitose City Future Vision is as follows.

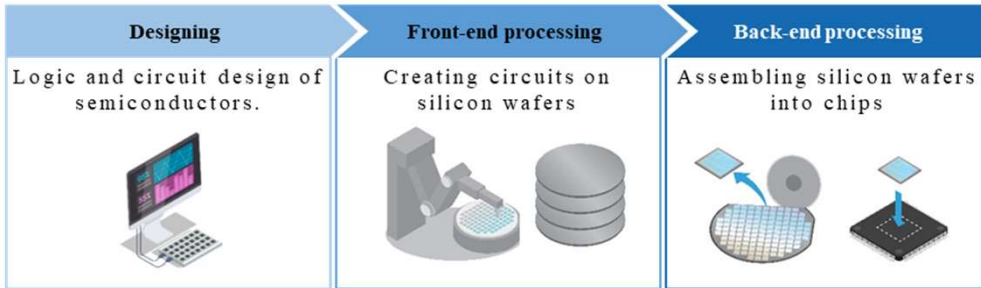
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# 1. Overview of the Semiconductor Industry

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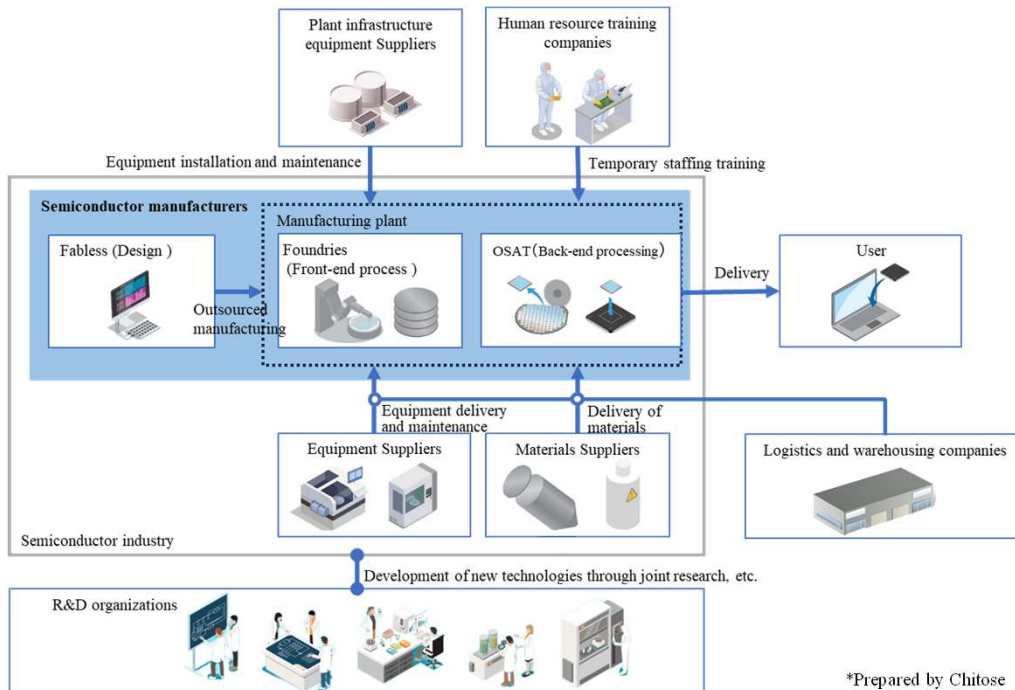
## Structure of the semiconductor industry

- The semiconductor manufacturing chip process is divided into many sub-processes, and it is said that more than 1,000 processes are required to manufacture advanced semiconductors in the front-end process alone. In general, the manufacturing process can be broadly classified into the following three processes.



\*Prepared by Chitose

- Semiconductor chip manufacturing requires the involvement of numerous people, companies, research institutions, etc. The general industry structure is as follows.



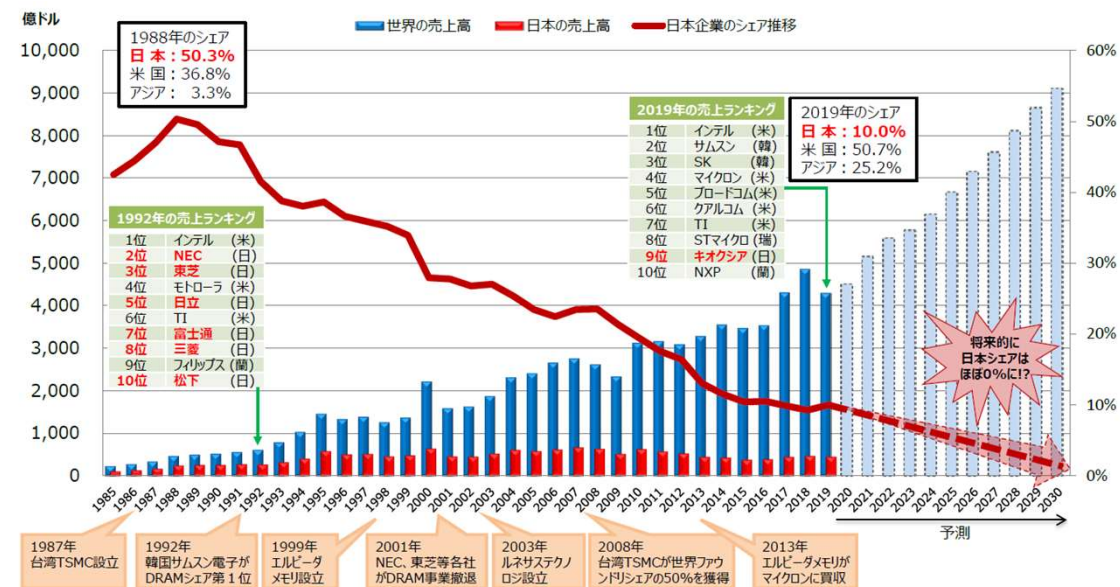
\*Prepared by Chitose

## Importance of the semiconductor industry

- Semiconductors are embedded in all kinds of electronic devices to the extent that they are even referred to in Japanese as “the rice, i.e. the staple food for industry”, including AI.
- In recent years, with the emergence of ChatGPT and other generative AI, semiconductors have become increasingly important, and countries have begun to view semiconductors as a strategic commodity, working to secure manufacturing capacity in their own countries.

## Situation of Japan on the global market

- The global semiconductor market is expected to expand to 45 trillion yen by 2019, with further growth expected in the future. Under such circumstances, Japan lags behind the world in production technology for advanced logic semiconductors.



\*Source: Ministry of Economy, Trade and Industry, “The First Meeting of the Council on the Study of Strategy for the Semiconductor and Digital Industry” (March 24, 2021)



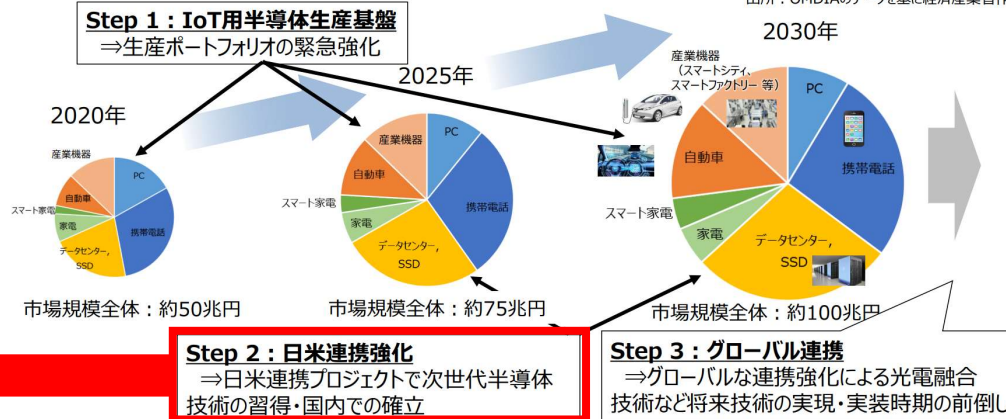
## 2. Rapidus Project as a national policy

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### Significance of supporting the semiconductor industry as a national policy

- Against the background of Japan's position in the global semiconductor industry and the global situation, including geopolitical risks, the Japanese government has announced a basic strategy for semiconductors and is taking the following steps.

出所：OMDIAのデータを基に経済産業省作成



\*Source: Ministry of Economy, Trade and Industry 「The 12th Meeting of the Council on the Study of Strategy for the Semiconductor and Digital Industry」 (December 23, 2024)

Chitose's understanding of Steps 1~3 is summarized below with reference to the Ministry of Economy, Trade and Industry's "Strategy for the Semiconductor and Digital Industry".

### Step1: Urgent infrastructure development / Urgent enhancement of IoT semiconductor production infrastructure (Urgent reinforcement of production portfolio)

#### Enhancement of manufacturing capacity

From the perspective of economic security, we will focus on developing and enhancing the manufacturing infrastructure to produce semiconductors domestically.

### Step2: Development of next-generation semiconductor manufacturing technology / Establishment of next-generation semiconductor technology infrastructure through Japan-U.S. collaboration

#### Launch of next generation semiconductor manufacturing facility (Rapidus is positioned here)

In order to regain Japan's technology, which is 10 years behind the rest of the world, and to strengthen our international competitiveness, we will focus on the development of next-generation semiconductor manufacturing technology through Japan-U.S. collaboration and develop the next-generation semiconductor production infrastructure.

### Step3: Realization of future technologies/global collaboration

#### Game changing with future technology

We aim to realize new technologies (such as optoelectronic fusion technology) that Japan has been researching ahead of the rest of the world, and to take a leading position in the world in cooperation with partner countries.

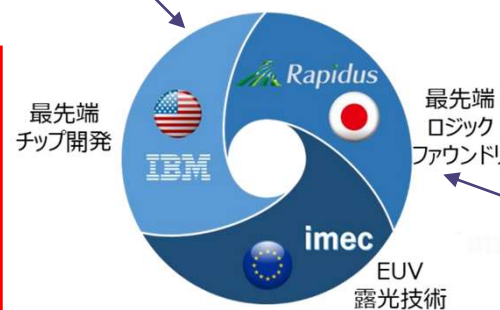
### The Rapidus Project

- In August 2022, Rapidus was established with the goal of producing next-generation semiconductors in our country.
- In November 2022, the New Energy and Industrial Technology Development Organization (NEDO), a national research and development organization under the jurisdiction of the Ministry of Economy, Trade and Industry, decided that Rapidus would be the R&D contractor for a national project aimed at mass producing next-generation logic semiconductors. The announcement that Rapidus would be producing 2nm semiconductors, the world's most advanced process node, came as a surprise to the public in Japan, which at the time was only producing semiconductors at the 40nm node only. Rapidus has announced plans to start mass production in 2027, following the operation of a pilot line in April 2025, and construction work on IIM -1, the company's manufacturing hub, is currently proceeding on schedule in preparation for the start of the pilot line.

### International cooperation and R&D

- Since Japan does not have the basic technology for the 2 nm process that Rapidus is aiming for, it is necessary to collaborate strongly with US and European countries that have technological expertise.

Concluded a strategic partnership agreement with IBM, the world's first developer of 2 nm semiconductors

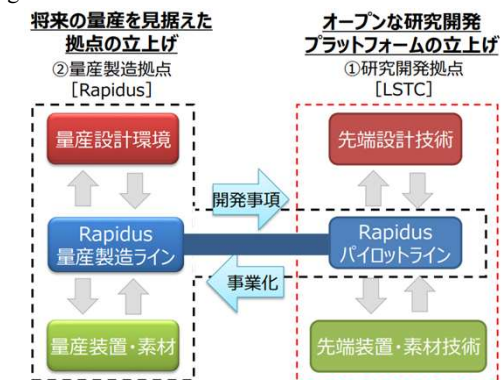


MOC was signed with imec, the world's leading research institute for miniaturization technology

\*Source: Ministry of Economy, Trade and Industry 「Strategy for the Semiconductor and Digital Industry」 (June, 2023)

Launch of the Leading-edge Semiconductor Technology Center (LSTC), a technical research association

Rapidus and LSTC are working together to build the foundation for mass production of next-generation semiconductors.



### 3. Initiatives of Chitose to Date

#### Initiatives for each infrastructure development

- The status of infrastructure development concerning Chitose Bibi World is as follows.

Purpose	Details of initiatives
Development activities for Chitose Bibi World (2nd phase)	Site measurement surveying services, soil contamination investigation services, application services for permission to change development activities, standing tree cutting services, stormwater control pond maintenance, etc., fire hydrant installation
Installation of water supply and sewage system, etc.	Installation of water supply pipes, installation of industrial water supply, expansion works of Chitose City Sewage Center, expansion works of Chitose City Sludge Center, development of Bibi sewage relay pumping station, installation of Bibi sewage water pressure pumping pipe
Road development	Development of Bibi Nishidori Street, development of Bibi Minamidori Street, development of Bibi Minamidori Street Overpass Bridge (Consigned to Hokkaido)

- By establishing the “Chitose City Infrastructure Coordination Meeting” and the “Chitose City Traffic Congestion Countermeasures Meeting,” we are coordinating and discussing with all parties concerned to ensure smooth progress of the construction work.

#### Efforts to Improve the Internal Organization of the Prefectural Government and Promote Citizens’ Understanding

- Chitose City established the “Headquarters for Promotion of the Next Generation Semiconductor Hub in Chitose City,” headed by the mayor, and the “Expert Committee,” consisting of managers of related sections to discuss and examine the identification of issues and initiatives.

##### <Topics for the Expert Committee>

Expansion of industrial parks, development of a welcoming environment, transportation infrastructure, environment-related measures, enhancement of education and human resource development, crisis management-related measures, enhancement of medical and welfare systems, measures for foreign residents, effective use of digital technology, etc.

- Efforts to promote the understanding of citizens and develop human resources

Purpose	Details of initiatives
Promotion of citizens’ understanding	Organizing seminars for the public, establishment of a website for information on semiconductors
Development of acceptance environment	Implementation of questionnaire survey on the intention of location of semiconductor-related companies, coordination with the Residential Support Project Team
Revitalization of the local economy	Organizing a business card exchange meeting between Rapidus/Kajima Construction and local companies
Development of human resources	Participation in the Council for the Promotion of Development of Human Resources in the Semiconductor Industry of Hokkaido, discussions for collaboration with Chitose Institute of Science and Technology and Hokkaido University
Conservation of water environment	Conclusion of agreement with Rapidus regarding plant effluent

- In addition, interview surveys were conducted with organizations, businesses, etc. related to and familiar with the fields of the technical subcommittees in order to obtain opinions to be reflected in the Vision.

#### Understanding the needs of semiconductor-related companies

- In general, the manufacture of semiconductors involves a complex number of sectors other than semiconductor-related companies, and the industry is made up of a wide variety of industries.
- In order to establish a hub for the semiconductor industry through the location of next-generation semiconductor manufacturing plants and the accompanying agglomeration of related companies, it is important to first understand the needs of semiconductor-related companies.
- To this end, we conducted a survey of business location trends in order to understand “which industries, when, how many companies, how many employees, and in what form” are moving into our city.
- In addition to a questionnaire survey of 4,000 semiconductor-related companies in Japan, more than 200 interview surveys were conducted with a total of 126 major companies and organizations in the semiconductor industry.

#### Results of the company survey

- The survey results indicated that in addition to the many companies that have already decided to locate, a wide variety of companies in a wide variety of industries are still considering locating here.
- Based on the results of this survey, the City will consider and implement community development measures such as the creation of new industrial parks and infrastructure development.

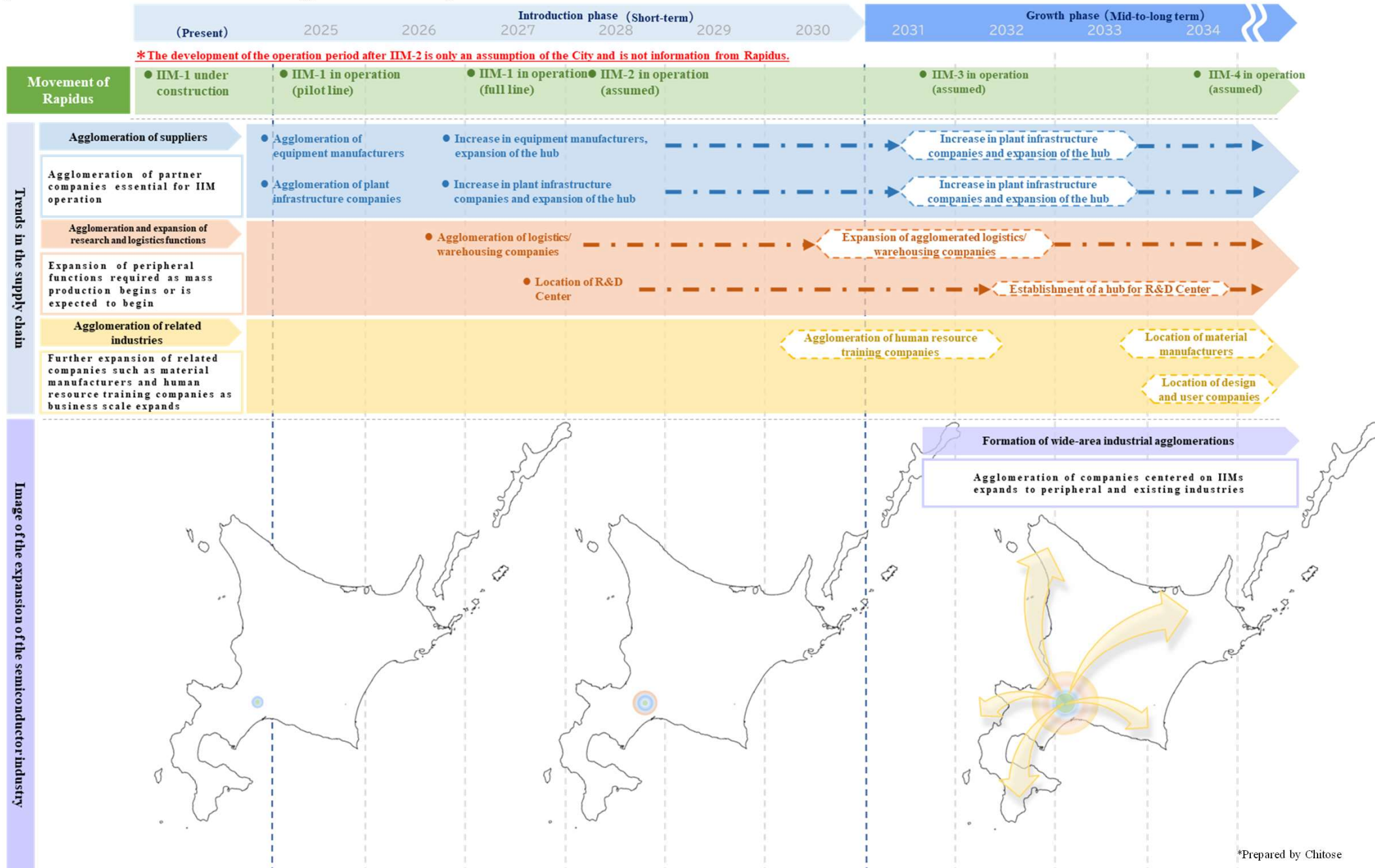
Players	Description	Number of confirmed locations	Number of considered locations
Semiconductor manufacturers	Companies that manufacture semiconductors	—	—
Equipment suppliers	Companies that manufacture equipment needed in the semiconductor manufacturing processes	16	29
Material suppliers	Companies that manufacture materials needed for manufacturing semiconductors	0	5
Plant infrastructure equipment suppliers	Companies that manufacture/install special equipment installed in semiconductor plants	10	4
Logistics and warehousing companies	Companies that control logistics related to semiconductor manufacturing	6	1
Universities and R&D institutions	Companies/organizations that research and develop semiconductor manufacturing	1	3
Others	Companies, etc., that train personnel to work in semiconductor plants.	4	15
Total		37	57

\*Details of the confirmation through interview surveys and the results of the desk study based on examples from other cities are provided in the full version.

## 4. Image of company agglomeration associated with the location of semiconductor manufacturing plants

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- It is expected that the hub of the semiconductor industry, centered on Rapigus' semiconductor manufacturing plants, will be developed as shown in the table below.
- It will take 20 to 30 years for the semiconductor industry to take root in the region. However, the economic development of Hokkaido, and indeed of Japan as a whole, is expected to progress as a result of wide-area industrial agglomeration in the prefecture.

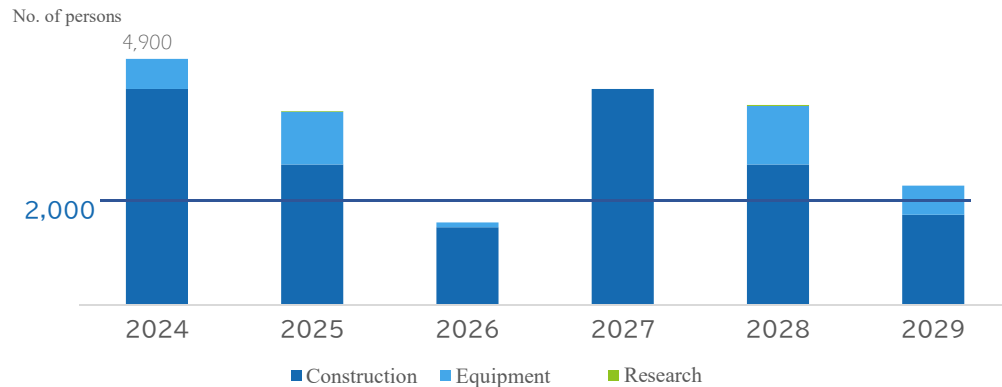


## 5. Effects on Flow of People and Consumption Associated with the Agglomeration of Companies

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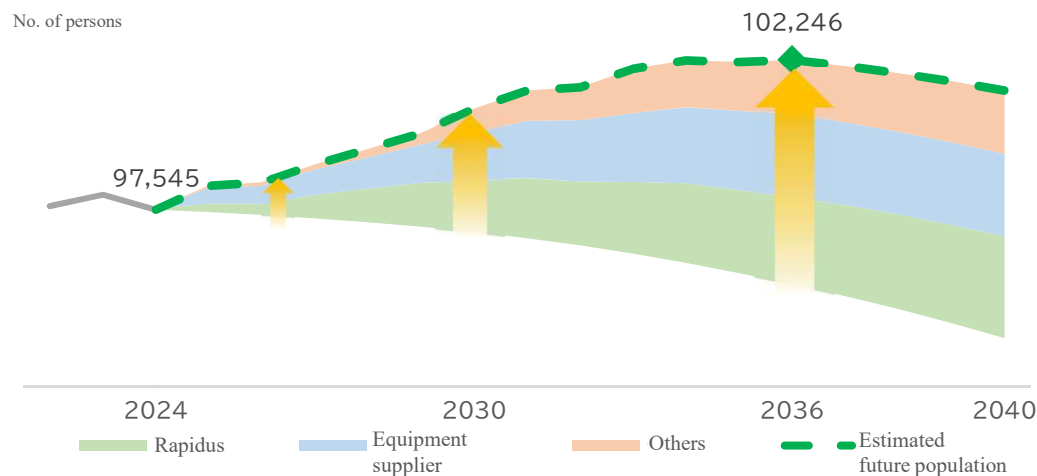
### Estimated visitors to Chitose City

- We assume that there will be roughly 2,000 or more IIM construction workers and traveling equipment supplier employees on a permanent basis.



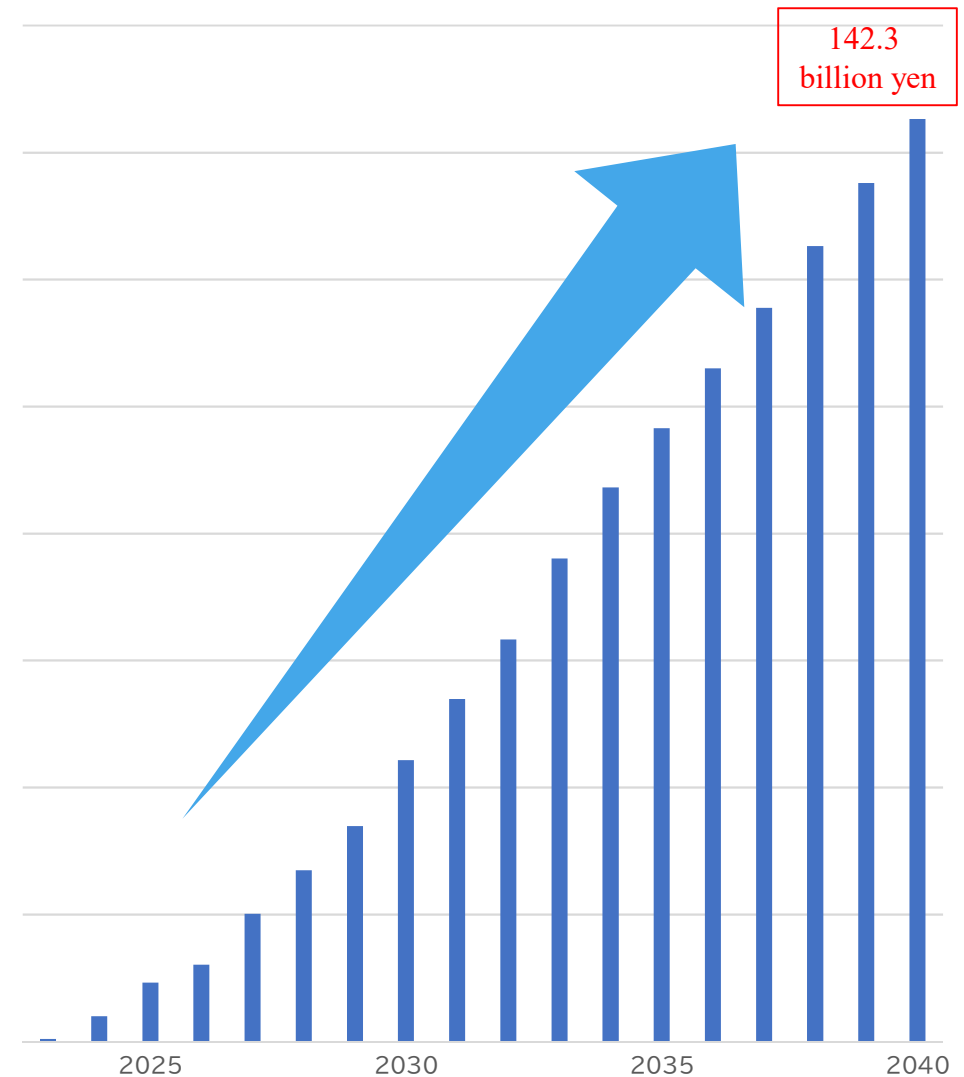
### Population estimates and projected industrial agglomeration effects for Chitose City

- We expect the city to grow by about 7,800 people as Rapidus, equipment suppliers, and other supply chain employees and their families move into the area, bringing the city's peak population to 102,000.



### Estimated consumption growth resulting from semiconductor industry agglomeration

- The increase in the number of business travelers and residents moving into the city will increase consumption activity in the city, which is expected to generate a cumulative effect of 142.3 billion yen in consumption by 2040.





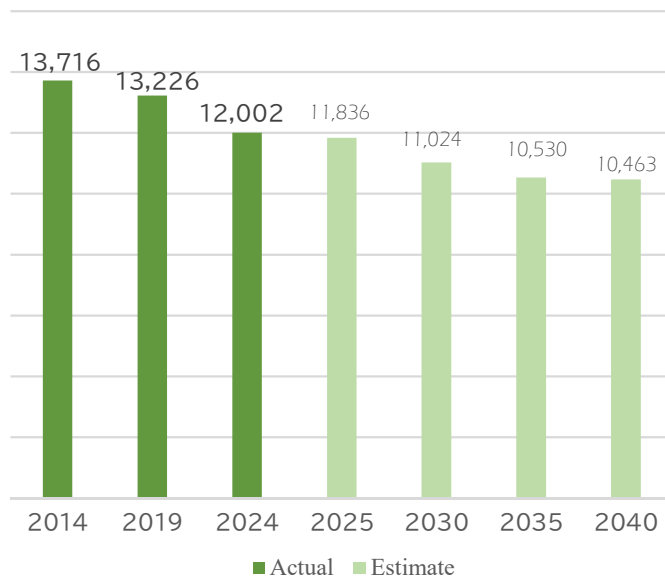
## 6. Relationship with Our Livelihoods

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### Childrearing and education

- The City's juvenile population decreased by approximately 1,700 between 2014 and 2024.
- We expect that the decreasing trend will continue after 2025, although the pace will be slower.
- Since the population is likely to change in the future due to the development of company agglomeration and changes in the social environment, a flexible response is required, such as taking steps to enhance childcare and education support according to the situation.

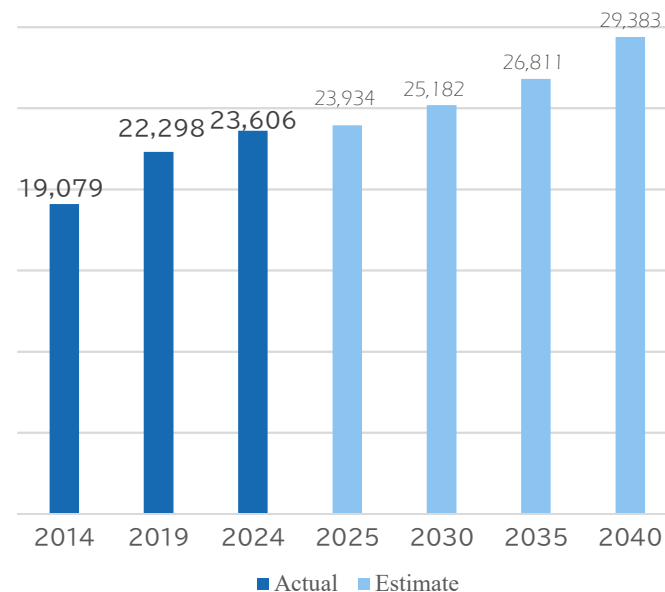
No. of persons Juvenile population (0 – 14 years old)



### Welfare and medical care for the elderly

- The geriatric population increased significantly by over 3,200 between 2014 and 2019 as the first baby boom generation (baby boomers) entered the geriatric population segment. 2019 to 2024 saw an increase of approximately 1,300 geriatric population.
- We assume that there will be no significant change in the aging of the population in the five-year period from 2025 to 2030, but the pace of aging will accelerate in the ten-year period from 2030 to 2040, with a projected increase of 4,200 elderly people.
- While taking into account the aging of the population and other demographic changes, it is necessary to ensure that the medical care provision system is adapted to future changes in medical needs.

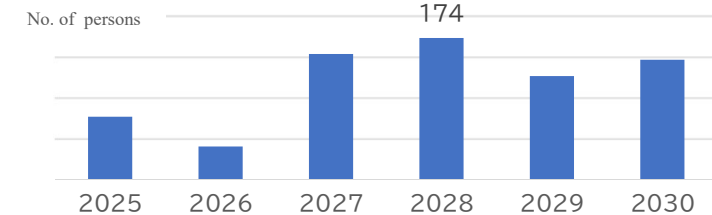
No. of persons Geriatric population (65 or older)



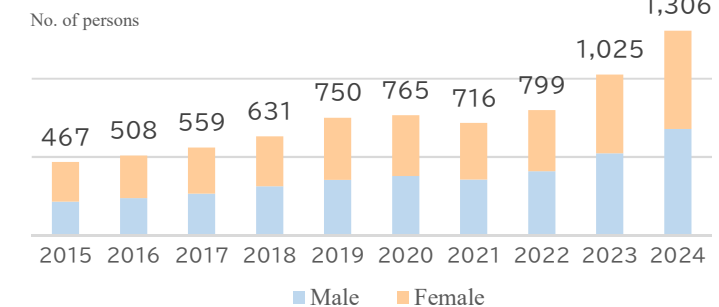
### Support for foreign nationals

- Although we expect that only a small number of foreign nationals will move into our city through agglomeration of the semiconductor industry, employees of foreign companies will be dispatched on business trips during installation and start-up of equipment.
- We estimate that about 170 foreigners will visit our city from January to March 2028 as the Rapidus project progresses.
- In the future, as the number of foreign nationals visiting Chitose from all over the world for research and other purposes is expected to increase, leading to more people settling in Chitose, it is necessary not only to upgrade accommodation, commercial facilities, medical care, and education to meet the needs of foreign nationals, and to improve information boards in the city, but also to promote mutual understanding among various cultures, considering the already increasing number of foreign nationals settling in Chitose.

Estimated number of foreign business travelers (Maximum annual number, per quarter)



Changes in the number of foreign permanent residents in the City





# 6. Relationship with Our Livelihoods

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## Human resource cultivation

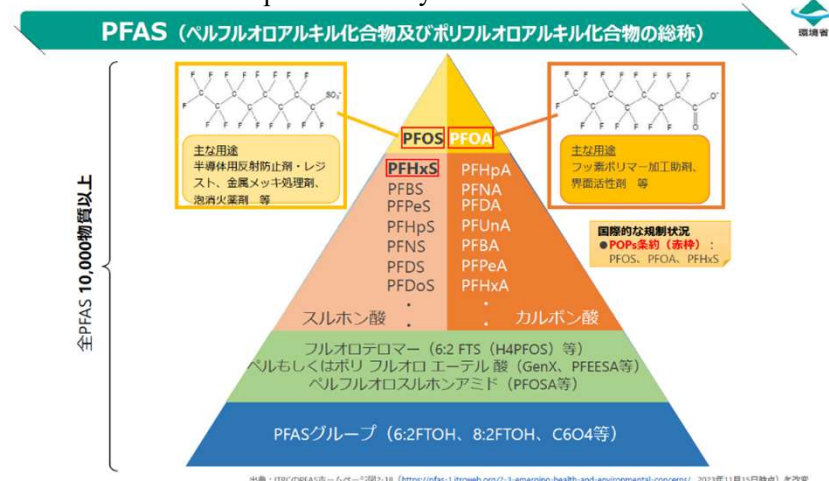
- The annual demand for semiconductor-related personnel in Hokkaido in FY2030 is expected to increase to 630 people. Therefore, in order to support the formation of a hub for the semiconductor industry, which is expected to undergo agglomeration in the future, there is an urgent need to develop human resources in the science and engineering sectors.
- We will also consider initiatives to develop specialized human resources at Chitose Institute of Science and Technology, build a sustainable human resource development and R&D complex hub for next-generation semiconductors in collaboration with Hokkaido University, and strengthen cooperation with the “Council for the Promotion of Development of Human Resources in the Semiconductor Industry, etc. of Hokkaido” established by the Hokkaido Bureau of Economy, Trade and Industry to develop human resources in a wide area.
- It is necessary to promote initiatives to increase the number of children interested in science-related subjects in cooperation with existing companies located in the city, as well as to create a mechanism for local human resources to be employed by companies in the city and to create a cycle within the community.



Source: Hokkaido Bureau of Economy, Trade and Industry, The Council for the Promotion of Development of Human Resources in the Semiconductor Industry (July 18, 2024)

## Surrounding environment (Water quality)

- Rapidus requires a large amount of water for the manufacture of semiconductors and therefore receives industrial water supply from Hokkaido. Hokkaido conducted a water quality survey and found that the combined total of PFOS and PFOA exceeded the provisional target value in the Abira River, which is used as raw water for industrial use. Although there is no problem with the use of the water as industrial water, an investigation is underway to determine the cause. The latest investigation has shown that the total value of PFOS and PFOA is below the provisional target value.
- Even in the Chitose River, the final discharge destination from the IIM, Hokkaido conducted a PFAS survey (PFOS, PFOA, and PFHxS), which was much lower than the provisional target values.
- Rapidus considers resist to be a chemical that may contain PFAS; all used resist will be collected through dedicated piping and disposed of as industrial waste, and equipment to remove PFAS will be installed in the plant to proactively address environmental conservation.
- In order to ensure the safety and security of our citizens, Chitose has been conducting water quality surveys since the national provisional target values were set for drinking water and has also conducted water quality surveys of the Chitose River, Bibi River, Chitose Lake and groundwater to assess the impact on the surrounding environment.
- Chitose will continue to conduct water quality surveys in the Chitose River and areas around the IIM, and will consider measures to protect the environment based on the status of PFAS studies in Japan and surveys conducted in Hokkaido.



- POPs条約においては、PFOS、PFOA、PFHxSの3つの化学物質が廃絶等の対象。
- その他のPFASについては、これら3つと同様な有害性等があると確認されているわけではない。

Source: Ministry of the Environment (https://www.env.go.jp/water/pfas.html)

## 7. Changes in the city through company agglomeration

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### Population growth in city center area

- The city center area around JR Chitose Station (mainly on the west side of the station) is an area with high housing needs for employees of Rapidus and supply chain companies.
- In response to this need, there has been an increase in the construction of apartment buildings, especially in the area around JR Chitose Station. In addition, several real estate developments by private companies have begun, and we expect apartment and condominium construction in the central city area to continue in the future.
- As a result, we estimate that the population around the central city area will increase by approximately 2,400 people as a result of the promotion of residence in the city center.

City center area map

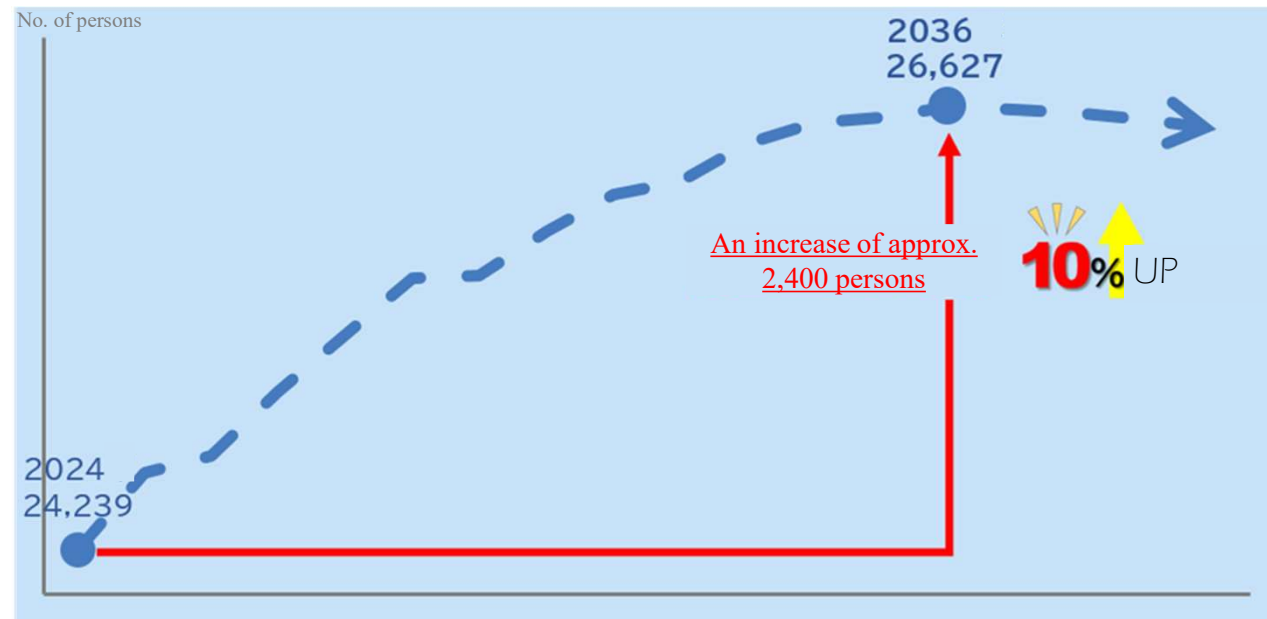


Building permit applications for apartment buildings in Chitose City

	FY2022		FY2023		FY2024	
Number of applications during the year	14		42		39	
Details	(1st half)	(2nd half)	(1st half)	(2nd half)	(1st half)	(2nd half)
	6	8	15	27	39	—

(Of these, the number of building permit applications in city centers is also on the rise.)

Predicted Future Population in the Central City Area



# 7. Changes in the city through company agglomeration

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## Changes in the city center and New Chitose Airport area

### City center area

#### Present to short-term (through 2030)

- Although there is a major shortage of office space and other properties, the future location of offices, hotels, restaurants, and other commercial facilities is expected to create a bustling atmosphere as the number of employees and business travelers increase significantly as a result of these facilities.
- New construction and expansion of apartment buildings around JR Chitose Station is expected to increase, and more employees of Rapidus and semiconductor-related companies are expected to live in the city center.

Since it is necessary to respond promptly to various needs, we will encourage development by the private sector and consider changes in city planning that will contribute to the advanced use of land as needed.

#### Medium to long term (after 2031)

- As Rapidus' business scale expands, it is expected that employees of semiconductor-related companies, including equipment suppliers, will continue to live in the city over the long term. As the number of families grows, we anticipate a shift in needs from rental apartments to condominiums for sale.
- Demand for more spacious office space is expected to increase as the number of employees of companies entering the market grows.

In addition to promoting development by private operators, the city will consider city-led development projects and change the city planning, if necessary.



### New Chitose Airport area

#### Present to short-term (through 2030)

- In order to achieve future agglomeration of companies, it is necessary to accelerate the development of new industrial parks and to consider how to deal with water and other resources that are expected to be in short supply in the future.
- In developing new roads, it is necessary to construct a transportation network that includes existing roads, such as the Hokkaido Central Region Access Ways and National Route 36, as well as a connection with the New Chitose Airport.
- New Chitose Airport is expected to generate a lot of human flow and logistics in the future, and airline demand is expected to increase further.

We will accelerate the creation of industrial parks, promote the development of water sources necessary for corporate activities, and respond to changes in city planning. We will also consider the construction of a transportation network that will provide optimal access around the airport, including the Bibi and Kashiwadaai areas, and continue to make requests to strengthen and enhance the functions of the New Chitose Airport.

#### Medium to long term (after 2031)

- Since it is expected that plants and research facilities, mainly for semiconductor-related companies, will be agglomerated and many people will come and go in the area, and the construction needs for hotels and commercial facilities will increase, it is necessary to consider new land utilization in the airport and its surrounding areas.
- At the New Chitose Airport, demand for air travel will increase, and road development to improve access to the airport will need to be promoted.

In addition to considering the development of further industrial parks and promoting the development of water sources, roads, and other infrastructure, we will examine land use to create an industrial agglomeration and exchange center. In addition, efforts will be made to promote the functional enhancement of New Chitose Airport and the construction of a transportation network.

## 8. Growth Potential of the Agglomerated Semiconductor Industry in Chitose City

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- The location of Rapidus' semiconductor manufacturing plant in this city offers growth potential for further agglomeration of the semiconductor industry.
- For further growth, aggressive attraction activities with clearly defined targets are necessary, and strategic efforts for the future are needed.

### POTENTIAL1

#### Attracting/Locating diverse foundries

- Multiple plants that manufacture different semiconductors, such as logic and power semiconductors, may be located in close proximity to each other, and suppliers such as material and equipment suppliers may also be agglomerated to form a strong supply chain.
- The economic benefits to the city will be significant as the company's agglomeration grows through a chain reaction.

### POTENTIAL2

#### Attracting/Fostering fabless companies

- Increasing complexity of semiconductor structures may attract fabless companies that are increasingly linked to foundries.
- In addition to attracting companies to use Rapidus' foundry services, it is also important to nurture and produce design ventures originating from our city.
- If the fabless hub is realized, it is expected that leading companies will emerge from this city.

### POTENTIAL3

#### Establishing a hub for research and development institutions

- There is a constant need for technological development in cutting-edge semiconductors, and the city is likely to see the expansion of overseas research institutions, especially Rapidus, and the agglomeration of R&D functions of domestic and foreign companies.
- By making our city the center of advanced semiconductor research in Japan, it is expected that the agglomeration of major domestic and foreign companies and research institutes, and the accompanying high-level human resources, will bring more than a simple increase in population and economic benefits to our city and our country.

### POTENTIAL4

#### Establishing a new industry hub using optoelectronic fusion technology

- The Japanese government's basic strategy and roadmap for the semiconductor industry identifies optoelectronic fusion technology as a key technology that will enable the realization of technologies beyond 2 nm.
- We expect that through research and development of optoelectronic fusion technology in our city, where next-generation semiconductors will be manufactured, as well as the implementation of the technology in various fields, it will not only solve social issues and develop industries in our city, but also strengthen our country's industrial competitiveness.
- New industries are expected to be created in the city through the implementation of cutting-edge technologies, and the city has the potential to become a top runner in next-generation industries such as optoelectronic fusion.

In our city, we aim to realize industrial clusters for the future based on these possibilities



## 9. Concepts of the Community to Aim for

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We assume that the agglomeration of companies and population in Chitose will change significantly in the future as a result of the location of Rapidus. Chitose needs to take advantage of this change to create a community where citizens can feel happy, comfortable, and satisfied with life, and to further develop the community for the future. In light of the above, we have established the following three concepts for the community that Chitose aims to become.

By promoting initiatives to achieve the three concepts, we will realize the sustainable development of the city and improve the lives of its citizens in the future.

A community  
where new  
ideas are  
created

We aim to create a “community where new ideas are created” by promoting the development of a city that continuously produces

innovations originating from Chitose, including the development of an infrastructure that allows diverse human resources of all nationalities to gather and communicate smoothly, and the creation of an environment that promotes research and development and startups.

### 《Elements for realization》

- Establishing international conference functions and co-creation spaces, etc.
- Multilingual support for administrative procedures, medical care, education, transportation, commerce, and other lifestyle-related services, as well as Initiatives to realize a multicultural society
- Providing demonstration fields for R&D and start-up businesses and utilizing the special zone system, etc.
- Comprehensive support for the expansion of university functions centered on the Chitose Institute of Science and Technology, etc.

A community  
where nature  
and people  
coexist in  
harmony

In order for the city to continue to develop sustainably in the future, it is necessary to promote city development that takes into

consideration nature and ecosystems, greening, and the spread of green energy to improve the quality of life of all people involved in the city, including its citizens.

### 《Elements for realization》

- Introducing environment-related educational programs and providing educational materials, etc.
- Measures and support to promote greening of walking spaces and plazas in city centers, etc.
- Creating places for people to interact by utilizing “nature and greenery” through the use of Park-PFI and other methods
- Comprehensive support for the supply and expansion of clean energy, etc.

A community  
where  
technology  
improves  
people's lives

New technologies including AI are expected to emerge in the future, and next-generation semiconductors manufactured in

our city will play an important role in these technologies. We aim to become a “city where technology improves people's lives” by proactively utilizing the technology created by next-generation semiconductors, etc. to realize more convenient and affluent lifestyles for citizens.

### 《Elements for realization》

- Utilization of digital twin technology, etc. and development of 3D urban data as well as study of measures to strengthen urban infrastructure, etc.
- Comprehensive support for research, experiments, etc. for the implementation of fully automated driving throughout the city, etc.
- Utilization of AI, robots, big data, etc. in administrative services, etc.
- Creating an environment that facilitates the use of new technologies by businesses in the city, etc.

A community  
where new  
ideas are  
created

A community  
where nature  
and people  
coexist in  
harmony

A community  
where  
technology  
improves  
people's lives

Concepts of the community to aim for

# 10. Scenes after the realization of our concepts

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01



The city center will undergo redevelopment and the city center will be transformed into a walkable townscape, creating a bustling daily life with people enjoying meals at the cafes and restaurants that will open in the street stores of the buildings and people enjoying walks and picnics in the green plazas. In addition, the development of technology will enable communication that transcends nationality and language, and a multicultural society is permeating the city.

02



People with new ideas and technologies will gather here one after another from all over the world, and international conferences will be held regularly where they can present their research results to each other, which will in turn generate new ideas and technologies. This virtuous cycle will continue to grow and develop the city.

03



A large-scale demonstration field will be set up on the outskirts of the city, where various companies from Japan and abroad will gather for demonstration tests to realize new technologies and services, and researchers and employees will stay in this town for medium- to long-term stays. This will encourage the use of the city center's restaurants, hotels, and other facilities, creating a more lively and bustling community.

04



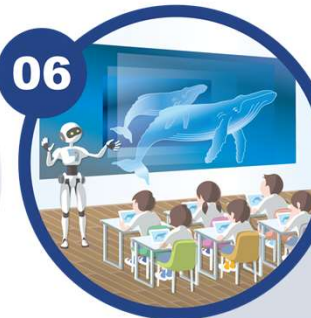
The use of clean energy will become widespread, with automobiles equipped with fully automated driving technology and hydrogen as their fuel, establishing a lifestyle that has an infinitely reduced impact on the natural environment. In addition, urban greening will be progressing, and living in harmony with greenery is bringing mental wellbeing to citizens.

05



Advanced sensing technology implemented in everything from roads to streetlights will be helping to prevent traffic accidents and control crimes such as theft, making the city a safer and more secure place to live. The technology will also enable proper evacuation guidance in the event of a disaster, and damage will be minimized.

06



With the evolution of AI, more effective and meaningful education will be realized through the use of adaptive learning, an educational program tailored to each student's aptitude and proficiency level, with AI robots providing full support to faculty and staff in grading work and supervising exams.

07



As virtual space technology evolves, new lifestyles and businesses will emerge that integrate the real and virtual worlds. For example, in a virtual world on the Internet called the Metaverse, it will be easy to communicate with people around the world in a realistic manner, such as shopping and conducting business meetings via avatars.

08



In all industries rooted in our city, advanced technology will be actively utilized to improve productivity in various fields. For example, in the agricultural sector, fields will be managed precisely by AI, and unmanned machines and AI robots will automatically perform farm work.



# 11. The Future Picture of the City





<b>IIM</b>	IIM (Innovative Integration for Manufacturing) is Rapidus' own term for a semiconductor manufacturing site that replaces the conventional “fab,” and is intended to “aim for a completely new type of semiconductor manufacturing”.
<b>EUV lithography</b>	A technical process in which special light with short wavelengths (EUV) is irradiated onto silicon wafers, which are the raw material for semiconductors. This technology is indispensable for the production of cutting-edge semiconductors.
<b>MOC</b>	An abbreviation of Memorandum of Cooperation.
<b>OSAT</b>	An abbreviation of Outsourced Semiconductor Assembly & Test.
<b>Optoelectronic fusion technology</b>	A technology that integrates optoelectronics into electronic devices and replaces electrical wiring with optical wiring to achieve energy savings, higher capacity, and lower latency.
<b>Sophisticated utilization</b>	It refers to the efficient use of land in city centers to encourage agglomeration of population and economic activity, and to improve urban functions such as building heightening.
<b>Supply chain</b>	It refers to the series of flows and supply networks from manufacturing a product to delivering it to the customer. It is considered important in business to manage each function, including procurement, transportation, and sales of materials and equipment necessary for manufacturing, so that they work properly.
<b>Supplier</b>	A company that supplies and delivers equipment, parts, materials, etc. necessary for the manufacture of products
<b>Nanometer</b>	A unit of measurement that represents one billionth of a meter. It is equivalent to 1/100,000th of the thickness of a hair. In this document, it is abbreviated as “nm”.
<b>Node</b>	This is an indicator of the generation of semiconductor manufacturing technology. The smaller the number, the higher the performance.

<b>Power semiconductor</b>	A type of semiconductor with voltage conversion and rectification functions. It is used in cars and large equipment.
<b>PFAS</b>	The term is a generic term for perfluoroalkyl and polyfluoroalkyl compounds among organofluorine compounds, of which there are reportedly more than 10,000 substances. Because of its excellent properties such as water resistance, water repellency, oil resistance, and heat resistance, it is used in a wide range of applications including foam fire extinguishing agents, metal plating treatment agents, antireflectants for semiconductors, insecticides, cookware coating agents, and food wrapping paper. The provisional target value is 50 ng/L for the sum of PFOS and PFOA, a level below which, based on the scientific knowledge at the time it was set, no adverse effects on human health would be expected if a person weighing 50 kg drank 2 liters daily over a lifetime.
<b>Fabless</b>	This term is used to refer to the lack of fabrication facilities, which is common among global IT companies such as Apple and NVIDIA.
<b>Foundry</b>	A company that manufactures semiconductors in its own factory under contract from a fabless company is called a foundry.
<b>Process node</b>	A semiconductor manufacturing technology process is called a process, and the technology generation is sometimes simply referred to as the “00 nm node” or sometimes expressed as the “00 nm process node.
<b>Portfolio</b>	A collection of different things, combined and lumped together. The production portfolio used in this document is a generic term for semiconductor types, supply chains, and other matters related to semiconductor manufacturing.
<b>Logic semiconductor</b>	A type of semiconductor with arithmetic functions. Logic semiconductors are used in CPUs and GPUs.



## Chitose Future Vision February 2025

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