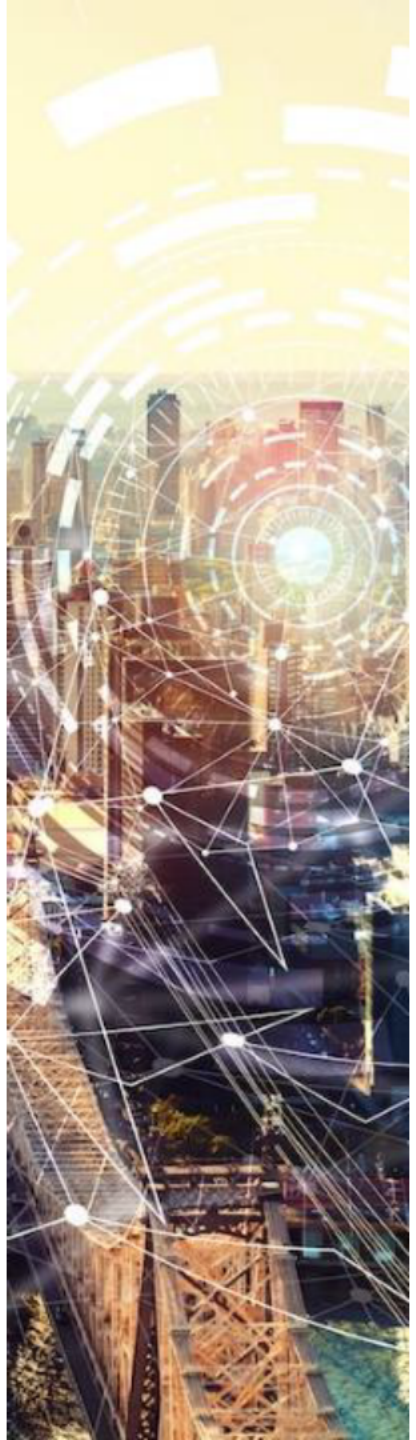
Smart City Solutions
Know-hows of Japanese Local Governments

Trade Finance Division, Trade and Economic Cooperation Bureau,
Ministry of Economy, Trade and Industry
(Contractor: Nomura Research Institute)

March 24, 2021

NRI

Share the Next Values!



Overview

Overview	This is a compilation of smart city projects in Japan, initiated with the solutions of the social issues various cities were facing, and centered on the know-hows of the municipalities and implementing organizations.
Background and purpose of compilation of the package	● In the emerging countries such as ASEAN nations, solutions and/or know-hows are not fully developed yet to solve such social issues as congestions and air pollution caused by rapid urbanization. ● In particular, the lack of know-hows relating to building consensus of local residents and ensuring/nurturing required organizations and HR is often pointed out as an issue. ● While smart services by the acquisition and use of personal data are expected to grow also in the emerging countries, with respect to handling of residents' personal data, discussions will likely to take place in more rigorous manner. Although it is not yet seen as a major issue, the lack of know-hows will definitely be an issue in the future. ● On the other hand, in Japan, a number of smart city cases are already developed, and various municipalities have accumulated, in the process of implementing solutions, know-how relating to building residents' consensus, establishing organizations, handling of personal data and so forth. ● The purpose of this document is to compile the above know-hows in a package to be shared overseas so that emerging countries could implement solutions smoothly.
Selection of the municipalities and organizations	● The ten municipalities/implementing organizations who cooperated in this endeavor were selected by the Ministry of Economy, Trade and industry and NRI based on such criteria as whether "the solution being in the implementation stage", "information being disseminated vigorously" and the like.

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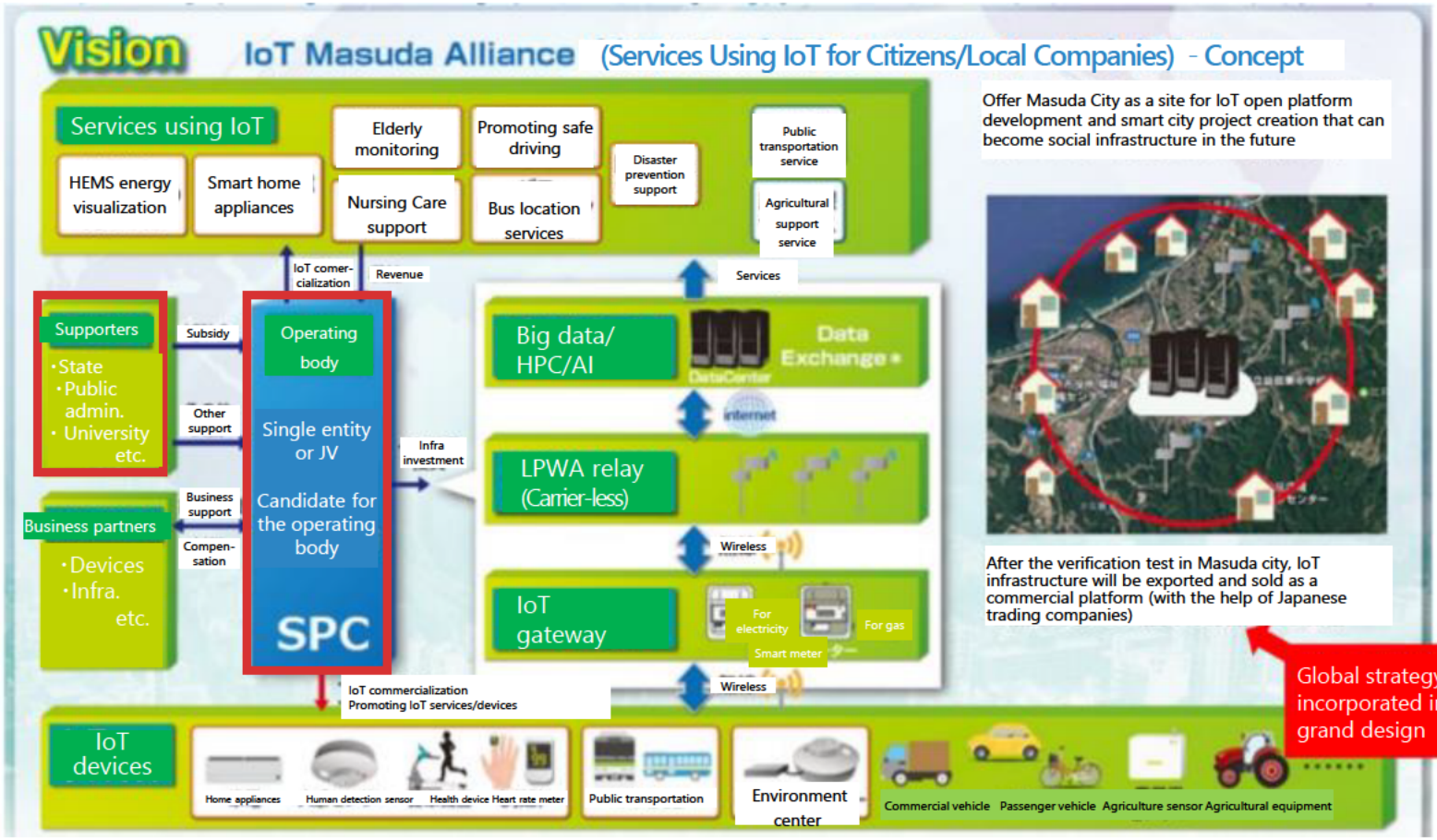
Regional/Industrial Development | Sustainable regional operation | Rolling out issue-driven smart services

Background/ Issues	✓ The region was exposed to all possible issues any falling provincial city faces such as shrinking job opportunities, decline of working age population, aging, deteriorating infrastructure and financial squeeze.
Solution implemented	**Rolling out issue-driven smart services**
KFS(1)	**An organization led by public-private partnership with its activities based in private sector** ✓ A public organization (MCSCC) is put in place to coordinate each initiative upon the request from the head of local government and facilitate the activities by voluntary groups as its base.
KFS(2)	**Local issues extracted to realize a rural-type smart city** ✓ Technology-oriented approach was not taken to solve the issues specific to the region ✓ IoT training sessions were held 11 times for the local city. The survey was conducted to find out people's complaints, current issues and what is needed for Masuda City
KFS(3)	**Sustainable operation by reducing the introduction cost** ✓ Keeping the cost of introducing telecommunication infrastructure low while using the latest technology such as wireless communication semiconductor that is globally compatible with the assumption that any local city should be able to implement.
Result	✓ The efforts are underway to scale out to other cities in Japan and overseas.

Rolling out issue-driven smart services | KFS(1) An organization led by public-private partnership with its activities based in private sector

✓ A public organization (MCSCC) is put in place to coordinate each initiative upon the request from the head of local government and facilitate the activities by voluntary groups as its base.

Overview of Healthcare Project in Cyber Smart City



Rolling out issue-driven smart services | KFS(2) Local issues extracted to realize a rural-type smart city

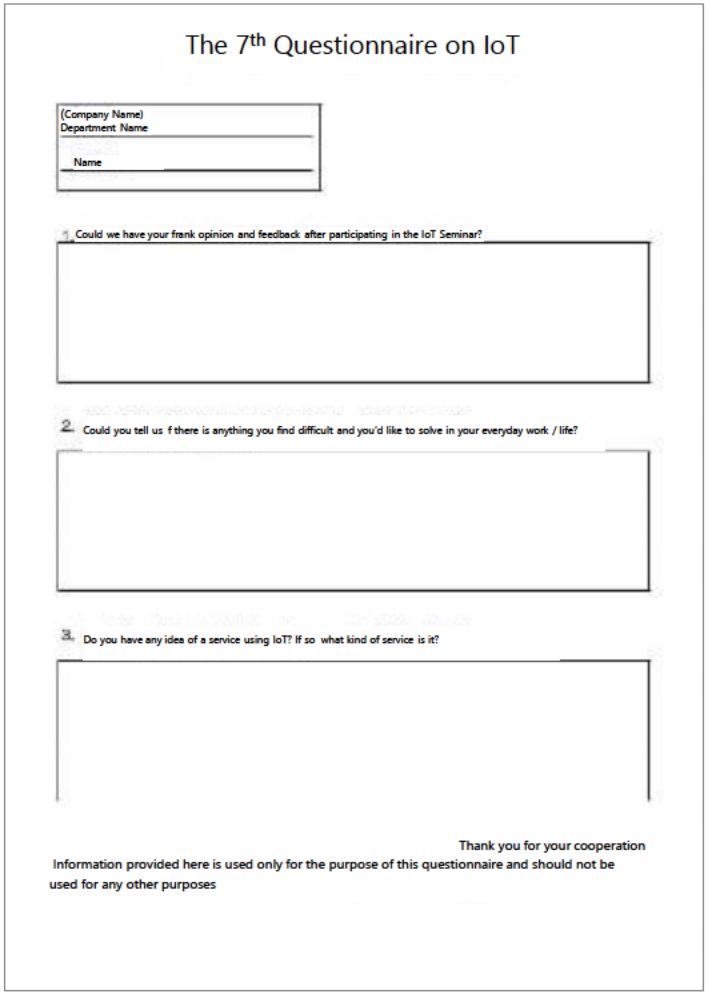
- Extract regional issues with the help of Masuda City Hall, Masuda Police, Masuda Fire Department, Masuda Tourist Association and local NPO groups, assess the local priority and evaluate the future of new industry as an exit strategy. Proposals for solutions are made with private sector's leadership, so that technologies and regional exchange ecosystem would be implemented in Masuda City.

Efforts to extract issues

- ✓ While many other smart city initiatives tend to be technology oriented, we held 11 training sessions to Masuda City people and conducted the survey to extract administrative issues, on which our discussions for solutions were based, which means we take an approach more target-oriented.
- ✓ Such approach resulted in such initiatives as healthcare and elderly monitoring. Currently 10 projects are underway, and what's common among them is that they are all tackling with the local issues.
- ✓ Many are purely local initiatives such as the agricultural ones, but activities are not limited only within Masuda City, but involve people from outside such as NICT, Keio University, Nagasaki University, Masuda Police Station of Shimane Prefectural Police.

Representative Director,
Masuda Cyber Smart City Creative Consortium

Questionnaire



The 7th Questionnaire on IoT

(Company Name)
Department Name

Name

1. Could we have your frank opinion and feedback after participating in the IoT Seminar?

2. Could you tell us f there is anything you find difficult and you'd like to solve in your everyday work / life?

3. Do you have any idea of a service using IoT? If so what kind of service is it?

Thank you for your cooperation

Information provided here is used only for the purpose of this questionnaire and should not be used for any other purposes

Rolling out issue-driven smart services ｜KFS(3) Sustainable operation by reducing the introduction cost

■ Deploy LPWA to the entire city by implementing low-cost devices

IoT Gateway for Cyber Smart City (prototype)

New Product
For Masuda Smart City Project
IoT Gateway Device (BLE+LoRa/LTE M1)

▼ Mountable module

Wireless LAN?

BLE | LTE M1

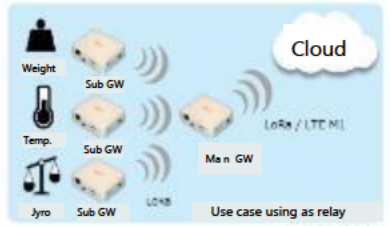
LoRa Private (920MHz)

▼ Mounted sensor I/F

UART | SPI | I2C

Customizable Module Compact Gateway Device

- Flexible connection
  Optional modules allow various network connection. Up to 2 modules can be chosen*1
- Easy connection with sensors (TBD)
  Support various I/Fs such as UART, SPI and I2
- Light weight & compact
  Realize compactness with layer structure
- Sensing wide area as relay
  LoRa module supporting 2km line of sight distance enables wide area sensing
- Low power consumption
  Realize low power consumption by original OS



*1 As for module combination there are some set patterns.. Please contact our sales rep. for details.
*2 Communication distance varies depending on the installation location.

Customized LPWA wireless module that supports transmission of blood pressure data

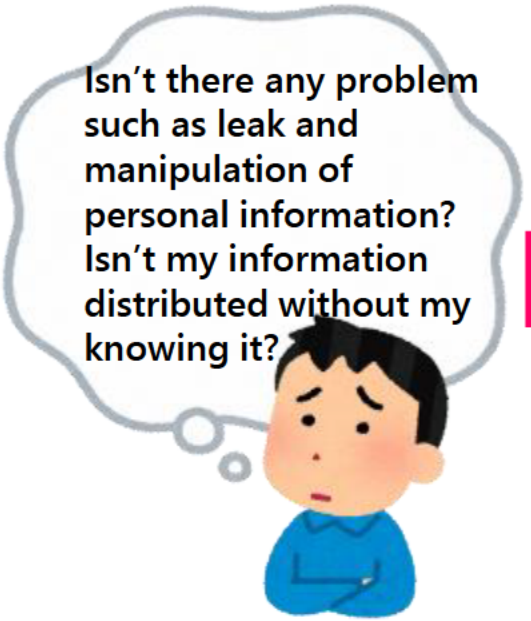
Regional/Industrial Development | Job creation and increase of related population | Building infrastructure for information utilization industry

Background/ Issues	✓ Outflow of mainly young people resulting in decrease of working-age population has been an issue. ✓ New job creation using the strength of the region in addition to attracting manufacturing factories done in the past was needed.
Solution implemented	**Building infrastructure for information utilization industry**
KFS(1)	**Opt-in operation of infrastructure/services** ✓ Basic premise is the information collected is used to provide services to those who provided it or for statistical processing.
KFS(2)	**Prepare offices to attract companies** ✓ Prepare and operate office environments on a par with those in metropolitan areas based on the hearing from companies.
KFS(3)	**Build the standardized digital information platform** ✓ The standardized "infrastructure" that can be used to provide the information from Aizuwakamatsu City and the region as well as a variety of services makes it easy to develop and enhance services without being locked in with certain vendors and scale out to other regions/cities.
Result	✓ Depopulation trend still continues with a big drop in April due to transfers, but recovered in May, slightly down in June and beyond, so the population is maintained without significant change from June to July.

Building infrastructure for information utilization industry | KFS(1) Opt-in operation of infrastructure/services

Personal information in 'Smart City Aizuwakamatsu' is handled with "Opt-in Model" where an owner of the information has to give her/his consent for its usage.

Doubts/anxiety of citizens



Legal/Technological Measures

- Personal information is managed/operated appropriately according to Act on the Protection of Personal Information and similar regulations
- Appropriate security measures are taken such as encrypting communication/data and data anonymization

"Opt-in" Data Utilization

- Basic premise is "My data is my property and I use it when and where I want to use it with my own will (consent) for more convenient life"
- "Opt-in" data usage is to collect and use data after clarifying what kind of data is collected/used, what the purpose is and where it is used and getting the consent from the users

Building infrastructure for information utilization industry | KFS(2) Prepare offices to attract companies

- Prepare an office building that can accommodate 500 people

"Smart City AiCT" Opened on April 22, 2019

◆Location 1-77 Higashisakae machi, Aizuwakamatsu City
◆Site area 9,496㎡ (About 2,900 tsubo)
◆Facility outline Office building: 4-floor steel-framed building, Socializing building, Parking lot for about 190 cars and for about 50 bicycles

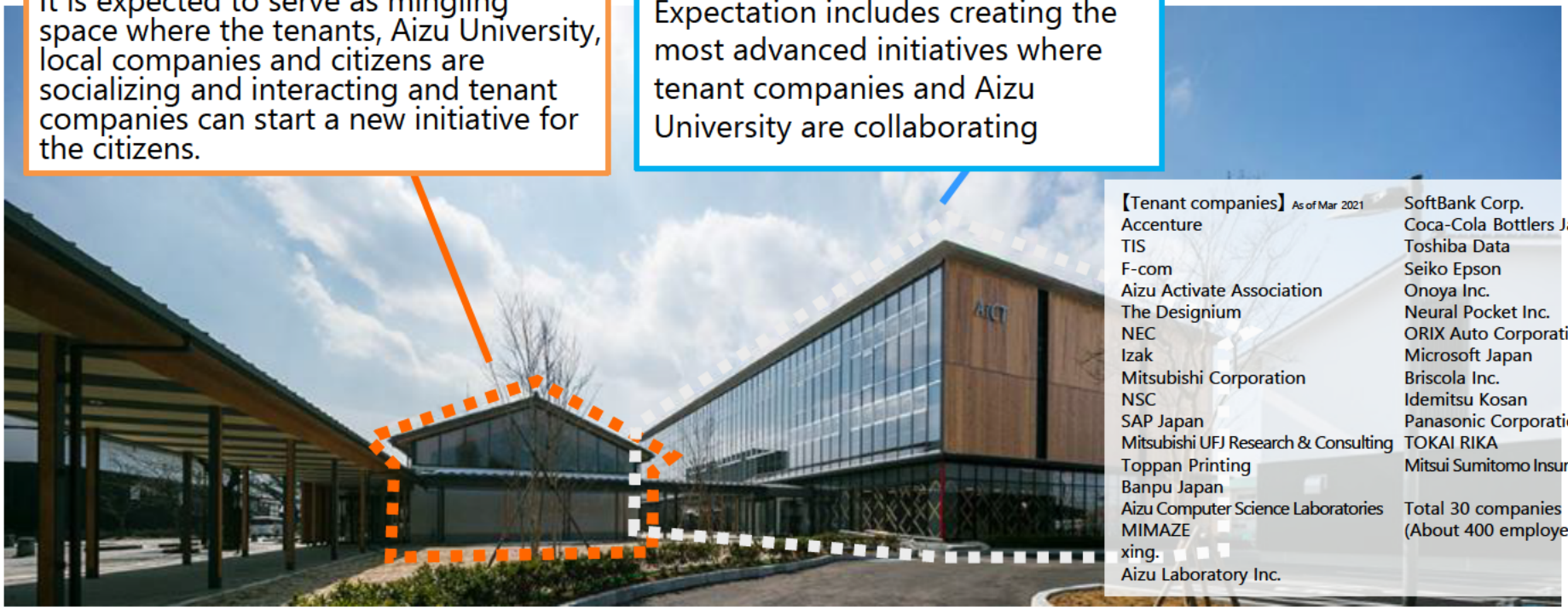
Job	Prepare offices to accommodate ICT companies together in one building = More people gather, more bustling in the neighborhood
People	Expect tenant companies hire graduates from Aizu University = Broader options for young people to find a job locally
Town	Town where companies doing business in ICT/Data Analysis gather = Brand image that Aizu is attracting cutting edge companies

Socializing Building

It is expected to serve as mingling space where the tenants, Aizu University, local companies and citizens are socializing and interacting and tenant companies can start a new initiative for the citizens.

Office Building

Expectation includes creating the most advanced initiatives where tenant companies and Aizu University are collaborating



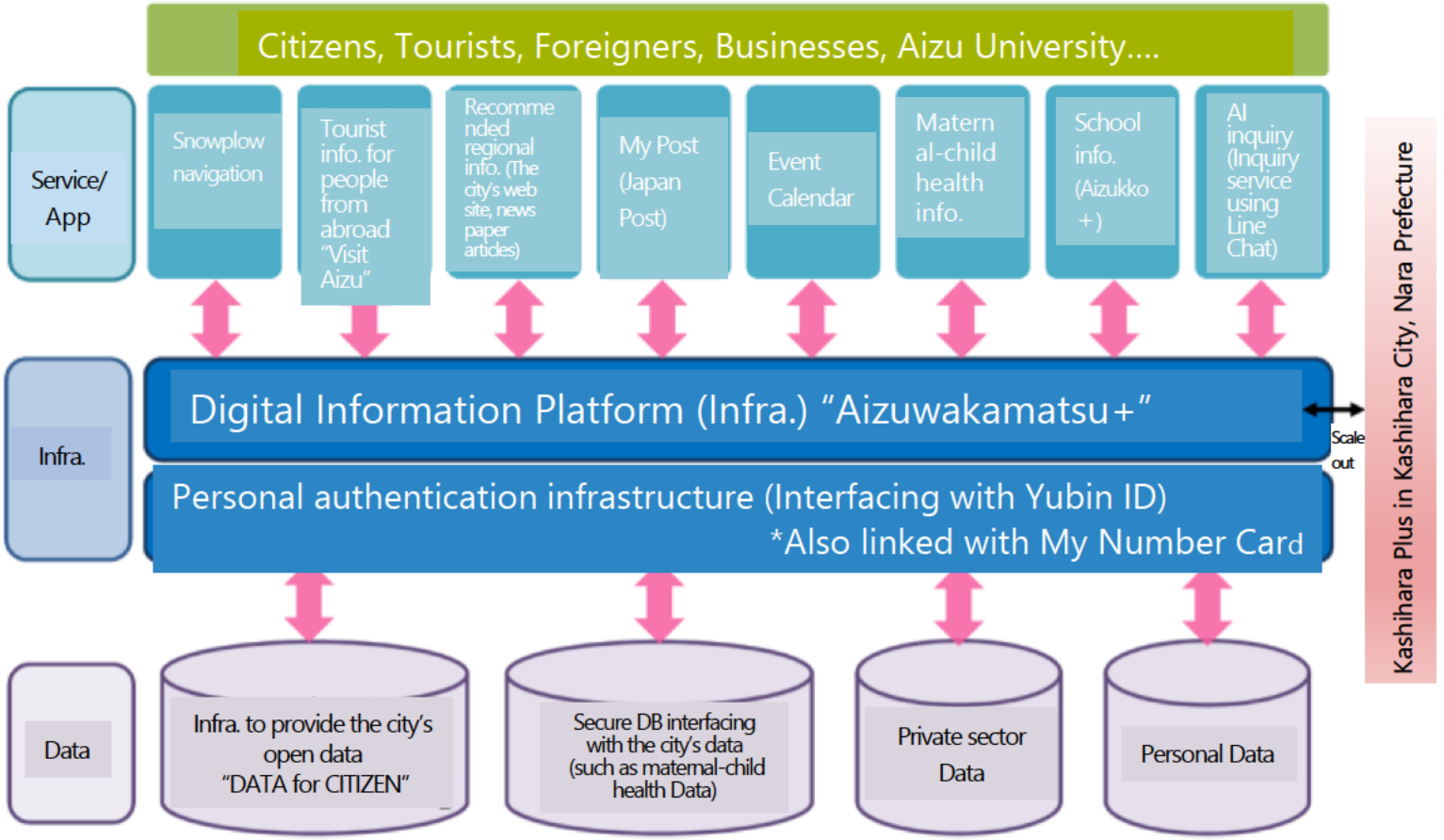
【Tenant companies】 As of Mar 2021

SoftBank Corp.
Accenture
Coca-Cola Bottlers Japan
TIS
Toshiba Data
F-com
Seiko Epson
Aizu Activate Association
Onoya Inc.
The Designium
Neural Pocket Inc.
NEC
ORIX Auto Corporation
Izak
Microsoft Japan
Mitsubishi Corporation
Briscola Inc.
NSC
Idemitsu Kosan
SAP Japan
Panasonic Corporation
Mitsubishi UFJ Research & Consulting
TOKAI RIKA
Toppan Printing
Mitsui Sumitomo Insurance Company
Banpu Japan
Aizu Computer Science Laboratories
Total 30 companies
MIMAZE
(About 400 employees to move in)
xing.
Aizu Laboratory Inc.

Building infrastructure for information utilization industry | KFS(3)Build the standardized digital information platform

■ "Infrastructure" from where information from Aizuwakamatsu City or the region and services in a variety of domains can be provided is standardized, so that it is vendor agnostic when developing and enhancing functionalities and is easy to scale out to other cities and regions.

Image of "Digital Information Platform" in Aizuwakamatsu City



Regional/Industrial Development | New industry development/ technological innovation | Business rollout utilizing sensor network

Background/ Issues	✓ Lack of manpower carrying out the community activities of mutual assistance such as watching over kids/seniors was apparent. ✓ It had become important to develop new industries and develop technological innovations to solve other problems including the deterioration of infrastructure.
Solution implemented	**Business rollout utilizing sensor network**
KFS (1)	**Industrial revitalization by communication network, and information infrastructure development and open recruitment** ✓ The government develops and manages the sensor network consisting of LPWA network and IoT platform, which is offered free to the recruited businesses for the verification testing environment of IoT devices, etc.
KFS (2)	**Enhancing citizens' understanding of IoT and other future technologies, and developing structure for collaboration through a watch-over-children service that takes privacy into consideration** ✓ Analyze big data jointly with Toyama Univ. upon masking participants' personal data, etc. ✓ Share analysis results with schools, parents, municipal development councils and other stakeholders.
KFS (3)	**Developing opportunities for tie-up among industry, government, academia and regional bodies for studying ways to solve regional problems** ✓ A base for future co-creation to be established, where studies and HR interaction programs for solving regional problems and creating new businesses would take place.
Result	✓ Number of open-recruitment projects conducted: 23 in FY 2019, 22 in FY2020 (new 12, ongoing 10). ✓ Aanalysis results of watch-over-children project are utilized for traffic safety activities and studies for the routes to and from school.

Business rollout utilizing sensor network | Overview

Overview

- Develop the “Toyama City Sensor Network”, consisting of LPWA network and IoT platform (FIWARE) covering entire city.
- The sensor network provided to private companies as verification test field to conduct open recruitment projects
- Also, for the purposes of enhancing citizens’ understanding of the sensor network and ensuring safety and security of the community, promote watch-over-children project. In coordination with the schools in the city, a fact-finding survey is underway gathering data of the routes the primary school pupils take to and from school by the GPS sensors lent to them.

Purpose for the business rollout utilizing sensor network

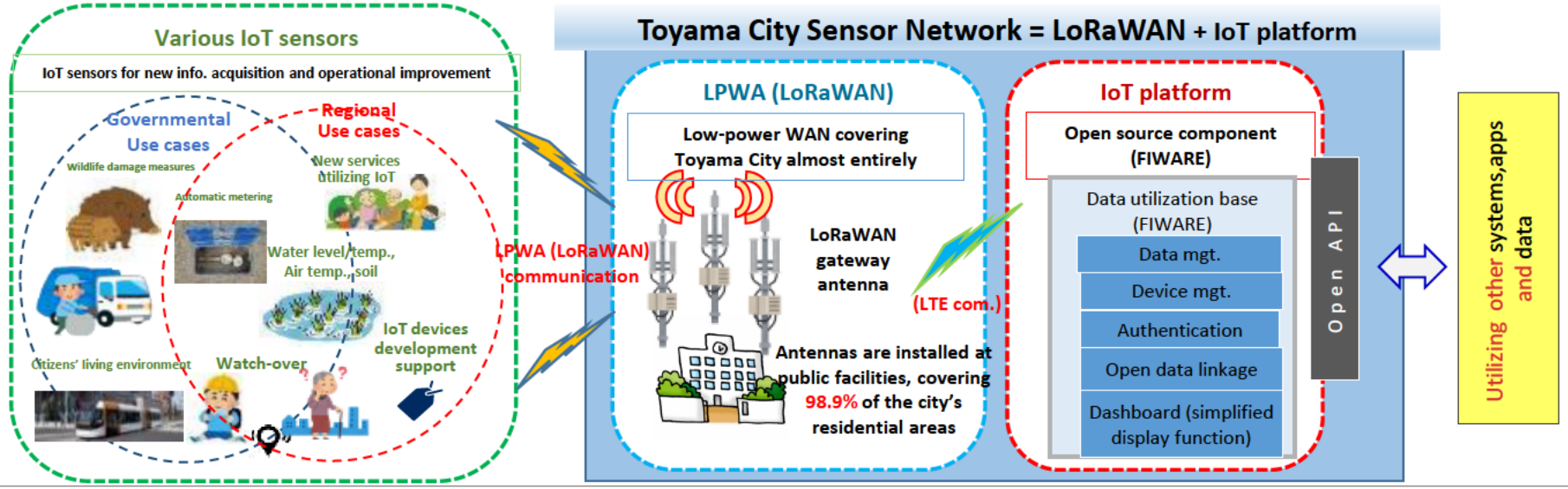
Promoting regional industry

➢ By setting up the verification test environment, lower the market entry barriers of the IoT sensor business for ventures and SMEs.

Ensuring safety by utilizing watch-over services

➢ Promote the development of safe and secure communities by utilizing IoT technologies, etc.

Illustration



Business rollout utilizing sensor network ｜KFS (1) Industrial revitalization by communication network, and information infrastructure development and open recruitment

- The “Toyama City Sensor Network” was built by developing an LPWA network covering the city almost entirely and an IoT platform equipped with open API.
- Open recruitment project was conducted as the sensor network offered as a verification test field, The recruited businesses are provided the sensor network free of charge. The recruited businesses can participate in the verification test by procuring sensors compatible with the LoRaWAN and systems using collected data.
- Although no government subsidy is granted, in order to recruit many participants, the documents required to submit are simplified and challenges in new fields are taken positively.

FY 2020 Verification Test open recruitment leaflet (partial)

When participating in the verification test:
(1) The Toyama City Sensor Network is provided free of charge as a verification test field of IoT devices ;
(2) The test results are posted in the city’s website, supporting region-to-region collaboration;
(3) A test results debriefing session will be organized to support region-to-region and private-to-government collaboration.

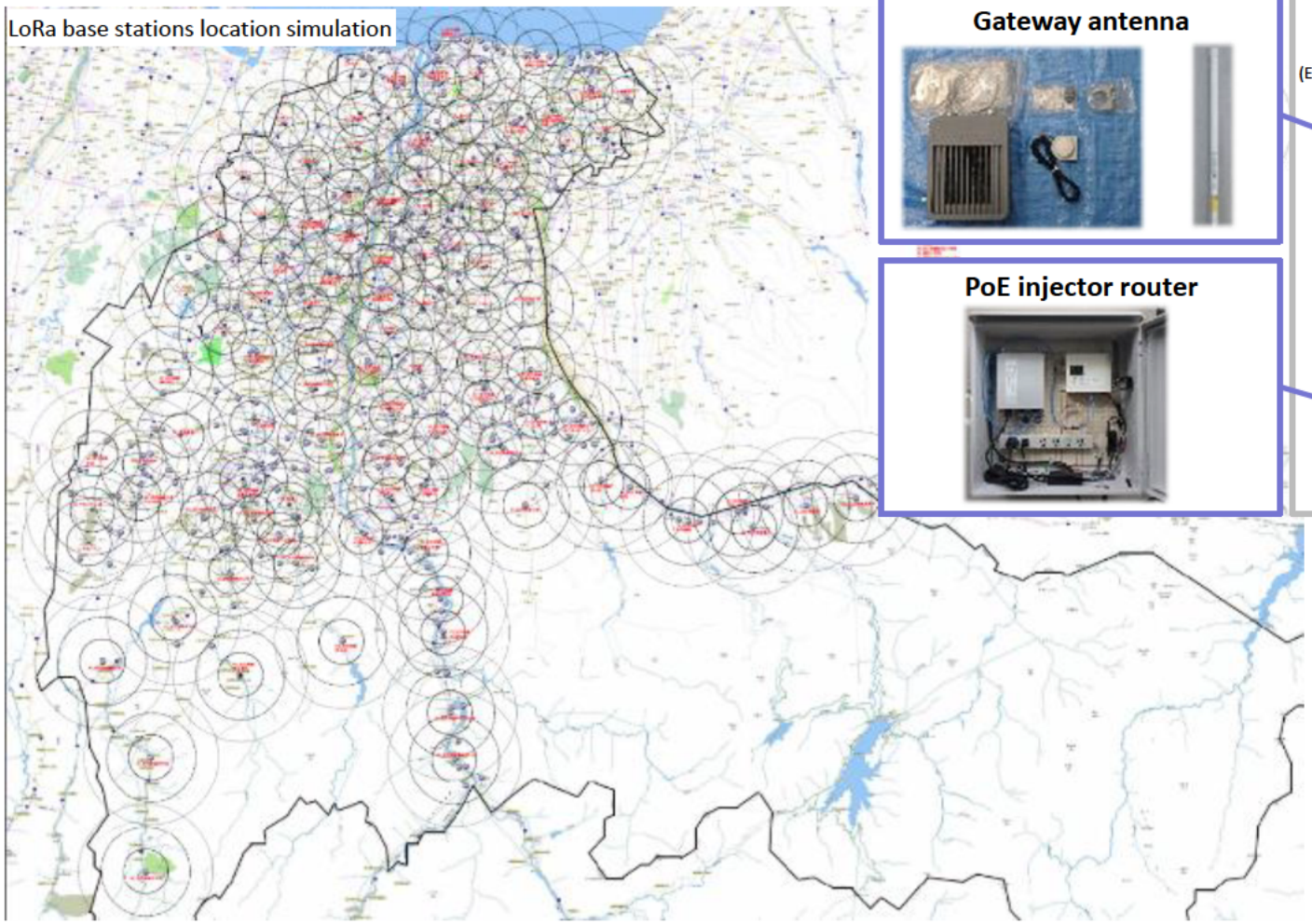
Scope of responsibility when using the Toyama City Sensor Network

- ✓ Registration is allowed when sensors comply with the LoRa standards (920MHz-band).
- ✓ The systems owned by business operators can be linked to the IoT platform by complying with open API (additional license not required).

Business operator	Procurement and management of LoRa sensor	The recruited party procures and sets up LoRa sensors. A parameter sheet is submitted to Toyama City. The City completes registration for the IoT platform.
Toyama City	Management of LoRaWAN (communication network)	
Toyama City	Management of data collection base	When checking the status of data acquisition from LoRa sensors only, it can be done by using the Dashboard run by Toyama City. It is not necessary to develop a separate system.
Business operator	Development and management of systems using collected data	When developing an own UI, systems can be built by linking data using CSV file or API from the IoT platform.

Reference: LoRaWAN gateway location map

■ LoRaWAN gateway antennas are installed at 100 facilities in the city, covering 98.9 percent of the resident population.



Gateway antenna

PoE injector router

Main installation locations

(Emergency radio sys. pole)

(Toyota Elementary School)

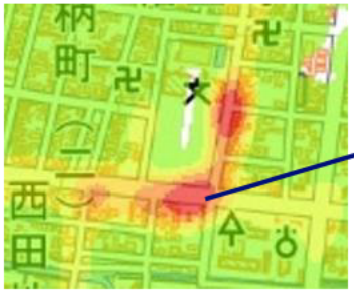
(Yamamuro Central District Center)

Business rollout utilizing sensor network | KFS (2) Enhancing citizens' understanding of IoT and other future technologies, and developing structure for collaboration through a watch-over-children service that takes privacy into consideration

Watch-over-children project: Overview

- Lend GPS sensors to elementary school children of the city and acquire their travel data from the sensor network. Analyze the acquired data jointly with Toyama Univ. and share information with schools, PTA, municipal development councils, etc. to improve safety and security of the children together with local residents.

Example of acquired data analysis



When crossing the main street near the school, children get stuck near the overpass.

Debriefing to PTA, etc

Analysis result document distributed to parents

Taking privacy into account for the watch-over-children project

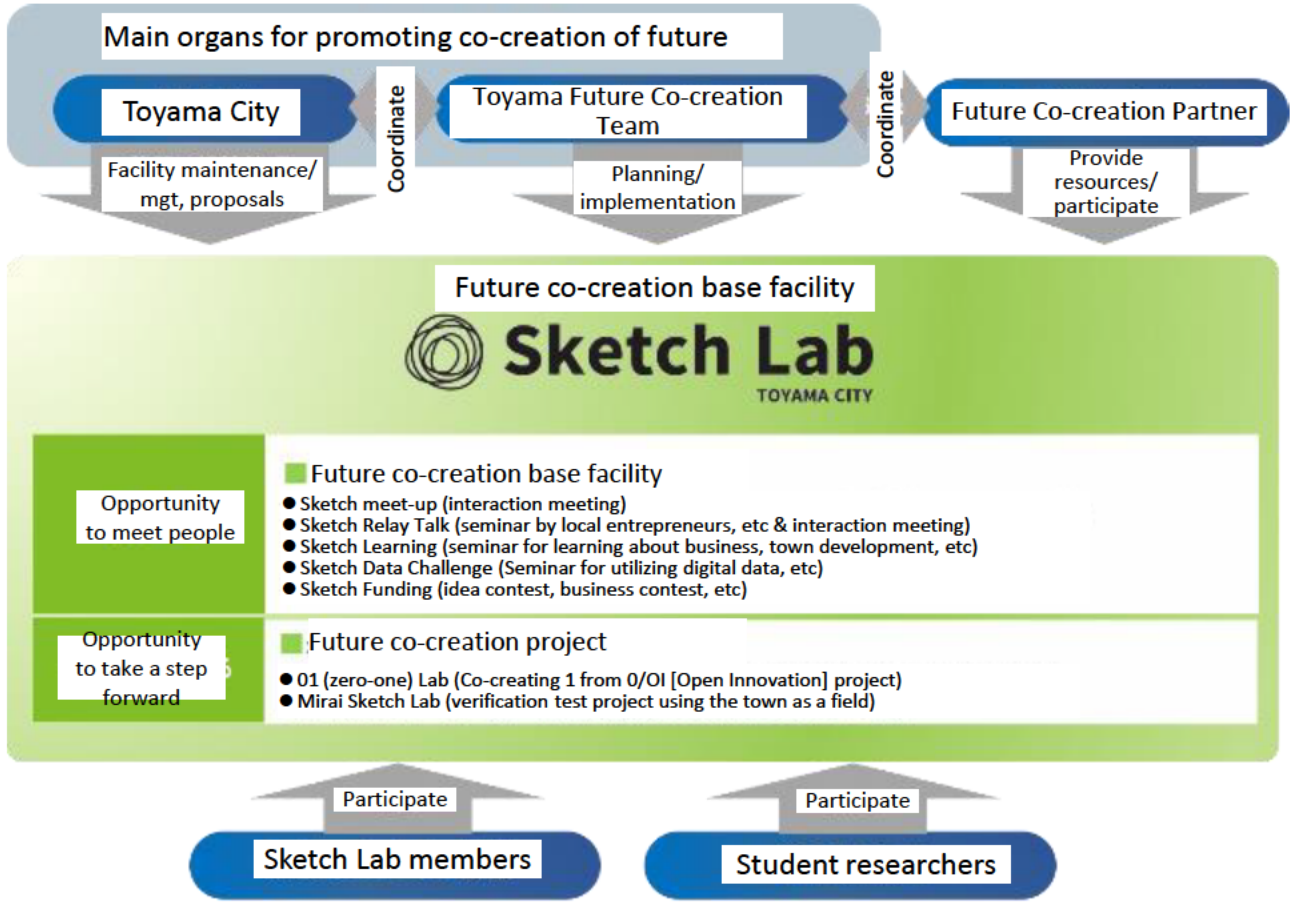
- ✓ A list that identifies individuals, i.e."which child has which sensor" is handled only inside the city government, **not posted in the city OS**.
- ✓ **Concerning children's location info., not to allow their homes identified ,** requests are made to Toyama Univ. to **delete the data within a 50m radius of the homes upon analysis**
- ✓ To prevent misuse for kidnapping, etc, the analysis data are shared **only with schools and parents, etc**, not disclosed to the public in such a manner that location can be identified.
- ✓ Visits to schools were made before starting the project, explaining the purpose of the project.
- ✓ Explanations are also given to the parents on such occasion as a general assembly of PTA, and upon obtaining their understanding and consent, data are collected only from those children who agreed to participate.
- ✓ Through this effort of "watching over children", which is easy for citizens to understand, **we started to improve citizens' understanding of the sensor network and nurture trust for it.**

Toyama City official in charge of Smart City

Business rollout utilizing sensor network | KFS (3) Developing opportunities for tie-up among industry, government, academia and regional bodies for studying ways to solve regional problems

- The "Sketch Lab" is up and running, which is designed as a facility for discussions for solving regional issues and creating new businesses jointly with the community members by promoting interaction of diversified HR from inside and outside the city and creating opportunities for dialogue to share future visions and/or regional issues, centered on young people.
- "Sketch Lab" is administered by "Toyama Future Co-creation Team", an organization of government-regional business cooperation among young entrepreneurs, businessmen, and Toyama City.

Structure for promoting co-creation of future



Regional/Industrial Development | Offer administrative information and making operations more efficient | Open data PF development

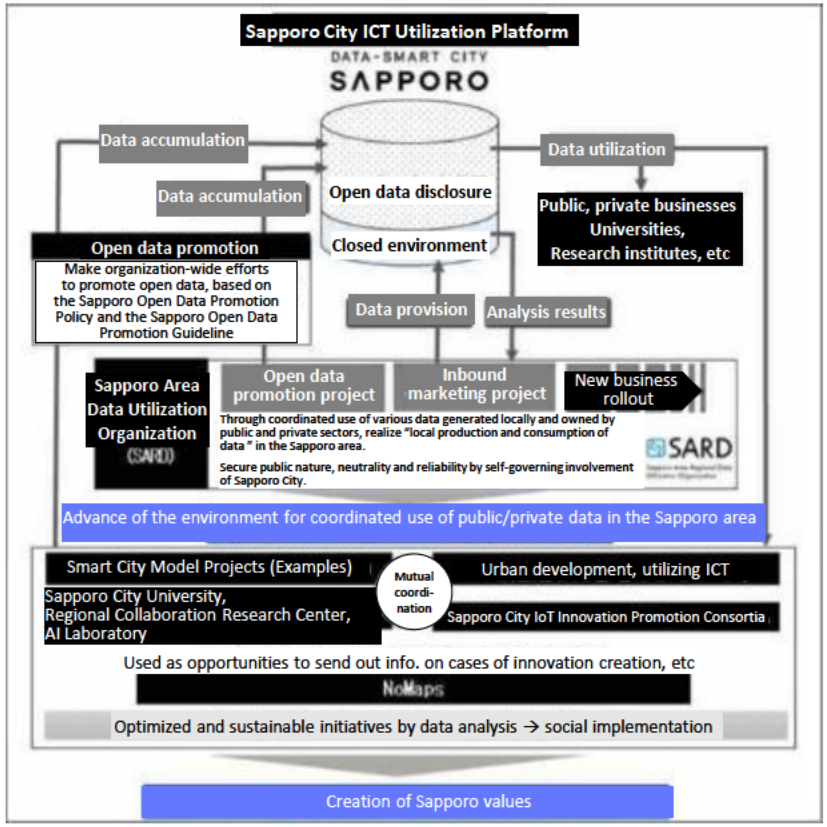
Background/ Issues	✓ Specific challenges were found including longer healthy life expectancy, revitalizing tourist spots, and measures against snow. ✓ It was necessary to put in place conditions under which it is easy for businesses, universities or the like to utilize open data for solving multiple challenges.
Solution implemented	**Open data PF development**
KFS (1)	**Linking and opening various data on PF** ✓ Administrative data and the data gathered from field operational testing, etc are made available in “data catalog ”. ✓ The PF was developed under the policy of not handling delicate personal data and limiting to statistical data when obtaining purchase data.
KFS (2)	**Enhancing coordination with neighboring municipalities through shared use of PF** ✓ Under the framework of the Coordinated Core City Area of the Ministry of Internal Affairs and Communications, municipalities were called on to promote open data through the use of data PF centered on Sapporo City, resulting in participation by Chitose City and Otaru City. ✓ For neighboring municipalities, the initial costs – which serve as a hurdle for data opening and PF development – can be cut.
Result	✓ Data linkage with the neighbouring municipalities (Otaru and Chitose Cities) is progressing.

Open data PF development | Overview

Overview

- Based on the “Sapporo City ICT Utilization Strategy”, jointly with the Sapporo Electronics and Industries Cultivation Foundation, the “Sapporo City ICT Utilization Platform” was developed.
- It is consisted of the “Data Catalog” and the “Dashboard”; the former allows easy search by field and use of the data owned by Sapporo City – including past records of disasters and estimated population in the future – and the data gathered from field operational testing, while the latter allows analysis and use of various data, showing vital statistics, public transportation status and others in easy-to-understand maps and graphs.

Sapporo City ICT Utilization Platform: Overall Picture



Data PF Development: Purposes

Promoting the use of open data by businesses and universities

- Through data gathering and management by public and private sectors, aim at multifaceted data analysis, new services and revitalized R&D.

Disseminating information to the public

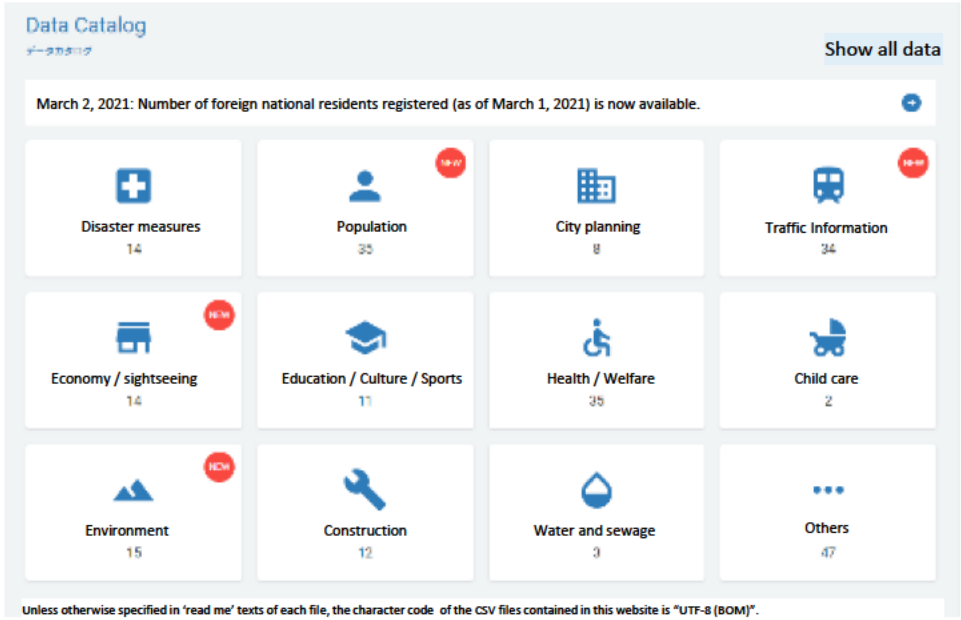
- Through the development of conditions under which people can easily come in contact with open data, raise awareness of the information and efforts of Sapporo City.

Platform UI: Illustration

Open data PF development ｜ KFS (1) Linking and opening various data on PF

- Administrative data and data gathered from various field operational testing are made available in “data catalogs”.
- The PF was developed under the policy of not handling delicate personal data and limiting to statistical data when obtaining purchase data.
- A “Dashboard” was developed, which allows analysis and use of various data, showing vital statistics, public transportation status and others in easy-to-understand maps and graphs.

Data catalog

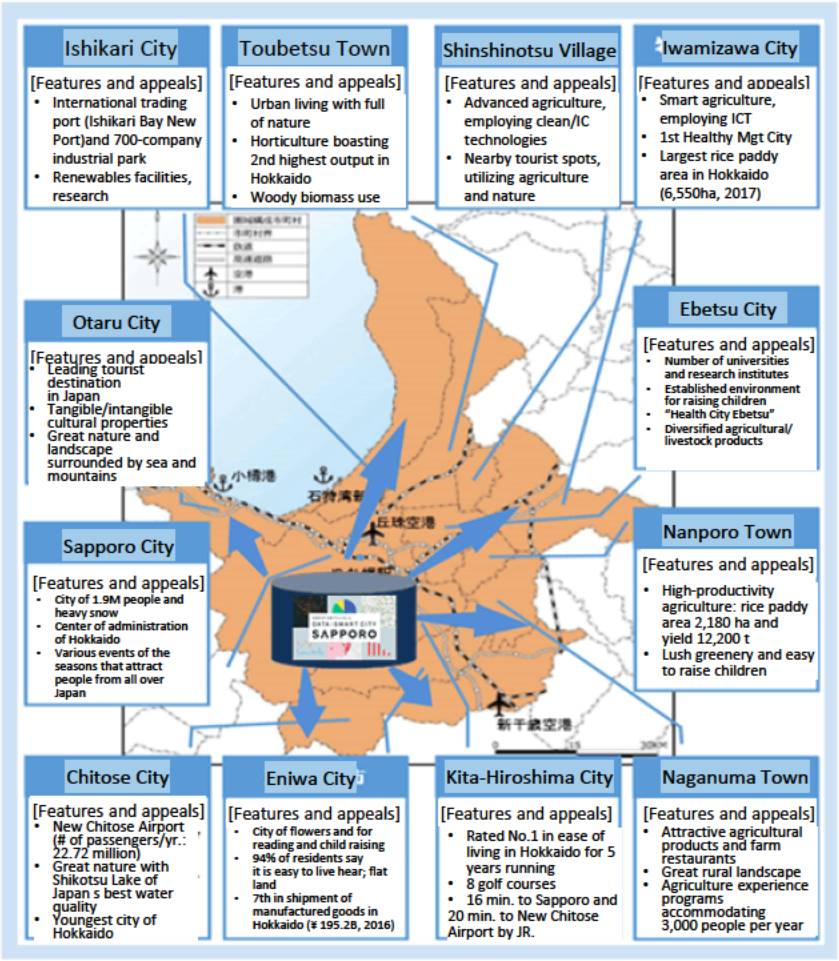


Dashboard UI: Illustration

Open data PF development ｜ KFS (2) Enhancing coordination with neighboring municipalities through shared use of PF

- Under the framework of the Coordinated Core City Area of the Ministry of Internal Affairs and Communications, municipalities were called on to promote open data through the use of data PF centered on Sapporo City, resulting in participation by Chitose City and Otaru City.
- For neighboring municipalities, the initial costs – which serve as a hurdle for data opening and PF development – can be cut.

Expanded use of "DATA-SMART CITY SAPPORO": Illustration



Coordination with neighboring municipalities

- ✓ Under the framework of the Coordinated Core City Area of the Ministry of Internal Affairs and Communications, municipalities were called on to promote open data through the use of data PF centered on Sapporo City, resulting in **participation by Chitose City and Otaru City**.
- ✓ **It is *mottainai***(wasteful) if the data PF is **used solely by Sapporo**, so we tried shared use, which can be adopted by other cities without initial costs. Currently, data on medical services of Chitose City and corona-related data of Otaru City are posted in Sapporo's data PF.
- ✓ We find it appropriate that our foundation is used at the beginning of data opening.
- ✓ We recognize that monetizing is a major challenge for smart city projects.

Assistant Director for ICT Strategy Promotion,
Policy Planning Division, City Planning Policy Bureau,
Sapporo City

Disaster/Crime Prevention | Deterring crime | Installation of "Mimamori" Cameras

Background/ Issues	✓ Higher crime rate than neighboring cities/towns led to a negative impression as a "crime-ridden city" . ✓ Also the number of missing elderly with dementia is higher than the neighboring cities, so safety and security for elderly was in demand.
Solution implemented	**Installing "Mimamori" Cameras**
KFS(1)	**Location selection and ordinance writing based on the citizens' voices** ✓ The city mayor himself held a briefing with a citizens' survey conducted before implementation . ✓ Reflecting the views of citizens upon selecting installation locations
KFS(2)	**Privacy protection through masking data and setting data retention period** ✓ Electronic masking over private images (windows, entrance, etc). ✓ Strict data management by overwriting after 12 days and providing images only upon the police request.
KFS(3)	**Set up a PF (Decidim) in place to raise awareness and get feedback from the citizens** ✓ After installing "Mimamori" Cameras, PF which facilitates more casual and flexible feedback than public comment was set up. ✓ Citizens are exchanging their opinions on Decidim.
Result	✓ The number of crimes is decreasing to the level similar to or below the prefectural average. ✓ Citizens' level of awareness and satisfaction of "Mimamori" Cameras is on the rise.

"Mimamori Camera" :
The word "Mimamori" in Japanese means to watch and protect. It is often used in the public service domain in the context of increasing the value for the community. The clear presence of cameras installed helps to deter crime. It also helps to solve incidents more quickly by providing data to the police.

Installation of " Mimamori" Cameras | Overview

Overview

- Securing safety for children when they go to and from school and out by installing Mimamori Cameras mainly along the routes to elementary schools and in the surrounding district.
- In FY 2017, 900 units were installed mainly in school zones and 575 units in FY2018 mainly around parks, bicycle parking lots and junctions of main roads.
- "A beacon tags (BLE tag)" is embedded in Mimamori Cameras to help find any missing children/elderly with dementia by providing families location tracking information, which is another Mimamori service the city is trying to enhance.

Objectives of the installation of " Mimamori "Cameras

Deterring crime

➢ **Deterrence of crime by clearly and visibly showing Mimamori Cameras are installed.**

Speedy solution of crimes and other incidents

➢ Helping crimes and other incidents to be solved more quickly by **providing image data to the investigating authority.**

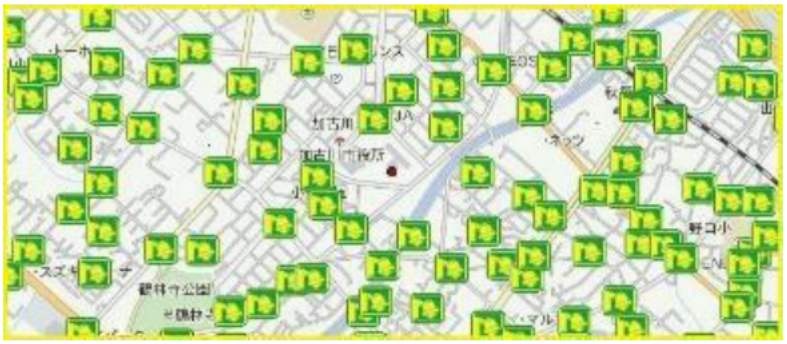
Securing safety of civic life

➢ Providing support to the investigation authority when they are searching for missing people and at the time of disaster, in checking the damage and verifying the situation afterwards.

Location image where the camera is installed

Images taken from the camera

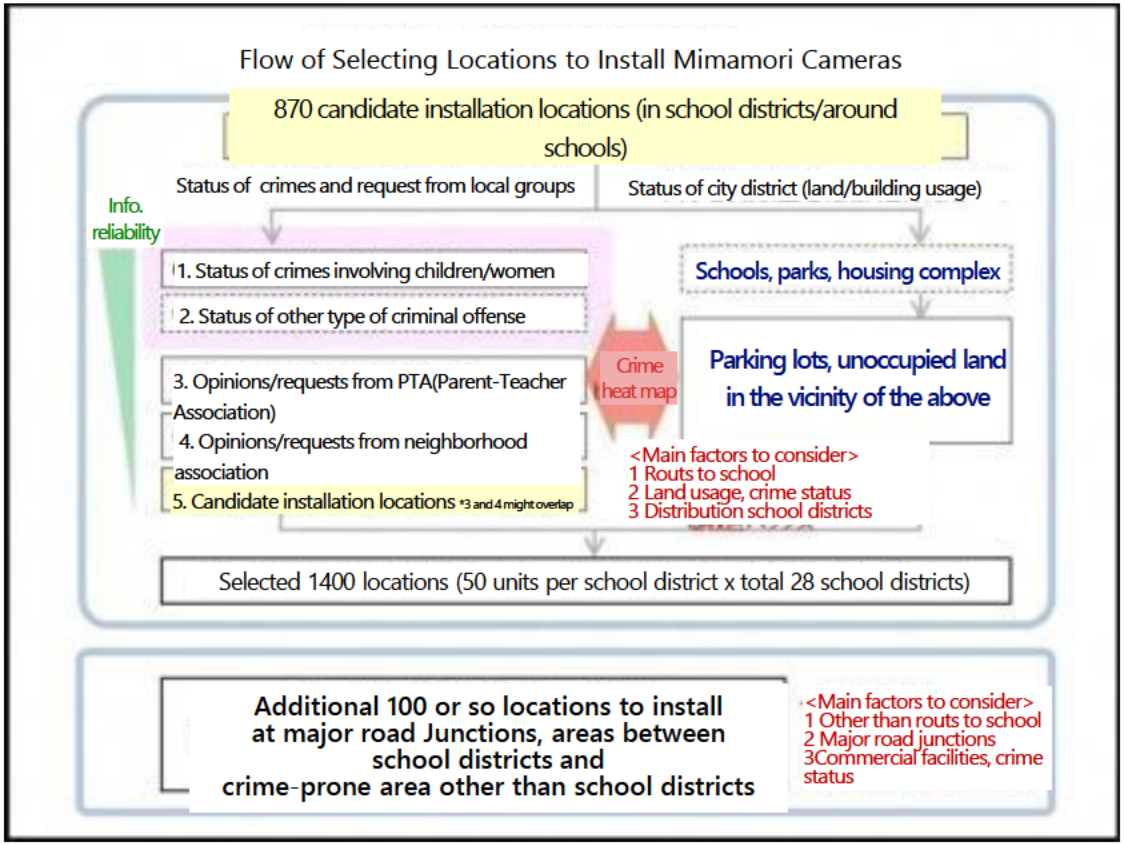
Installation locations



Installation of " Mimamori "Cameras | KFS(1) Location selection and ordinance writing based on the citizens' voices

- Selected 870 candidate locations to install (proposal) along the school routes and around
- Selected additional locations considering the status of criminal offenses, request from local groups and the status of the city district (usage of land/building)
- Finally, 1400 locations were selected (approximately 50 units per school district. There are in total 28 such districts).
- On top of the 1400, further 100 or so locations were selected at junctions of main roads, areas between the school districts and crime-prone areas.

Flow of Selecting Locations to Install Mimamori Cameras



Installation of “Mimamori” Cameras ｜KFS(2) Privacy protection through masking data and setting data retention period

Example of using privacy masking

- Considering portrait rights and privacy, the entrances, windows and terraces are blacked out so that they won’t be photographed.

Data retention period and monitoring

- ✓ **Monitoring does not take place continuously,** rather an SD card is equipped to the camera to store data.
- ✓ Upon request from the police, the information on the camera can be extracted remotely (using wireless communication).
- ✓ An SD card **stores the data for around 12 days** before overwriting happens according to the spec.
- ✓ Such operation is explained to and understood by the residents.

Assistant Section Manager,
Information Policy Section,
Planning Department,
Kakogawa City Hall

Reference Material Full text of Ordinance on the Installation and Operation of the Kakogawa City “Mimamori” Cameras

Refer to another file
「Reference Material Full Text of Ordinance on the Installation and Operation of the Kakogawa City Mimamori Camera」

Installation of “Mimamori” Cameras ｜KFS(3) Set up a PF (Decidim) in place to raise awareness and get feedback from the citizens

- Launched the on-line place (grassroot consensus building platform of Kakogawa City called Decidim) for the citizens to voice their opinions, discuss and feed their views to policy making processes) in order to create “Kakogawa City Smart City Scheme” together with the citizens after installing Mimamori Cameras.
- Currently there are around 200 users and 40% of them are high school students.

Decidim UI: Illustration

Wellness | Maintain/improve residents' health | Using personal data for healthcare services

Background/ Issues	✓ How to improve QOL of the people by providing regional services tailored to each individual resident through the use of data in light of diversifying life styles and needs had become a challenge for town development.
Solution implemented	**Using personal data for healthcare services**
KFS (1)	**Development of functions and rules for ensuring safety and security when providing personal data** ✓ To foster a sense of security for the personal data providers, equip the data platform with a function that allows the providers to choose and/or control the data recipients by themselves (VCRM function). ✓ Prescribe terms of use applicable to each of the data provider businesses, data user businesses and monitors. ✓ In addition, municipalities get involved in the service and hold briefing sessions for the people.
KFS (2)	**Exchange views on a regular basis with the municipality serving as a hub to facilitate B2B and B2 government interactions and coordination** ✓ Establish an organization for industry-government-academia collaboration and promote town development ✓ Hold regular meetings for exchanging views to facilitate interaction/coordination among businesses and between businesses and municipalities
Result	✓ About 100 citizens have given consent for providing personal data (health check-up results) to healthcare services and participated, confirming that it is possible to create new services to support citizens' livelihood by obtaining personal data.

Using personal data for healthcare services | Overview

Overview

- Aiming at safe and secured use of personal data, the integrated data platform, “Common Platform-Saitama version” was developed.
- The “Misono Data Mirai” project was started in 2019 for the development and verification of regional services that support the realization of life styles tailored to each and every citizen.
- The personal data gathered from civilian monitors – such as health check-up results, body composition data, purchase data and habitat data – are provided to data user businesses such as healthcare services, in an attempt to improve services rendered to the monitors.

Using personal data for healthcare services: Purposes

Fostering a sense of security when providing personal data

➢ Reduce anxiety of the people in providing personal data and foster a sense of security

Improving QOL by upgrading regional services

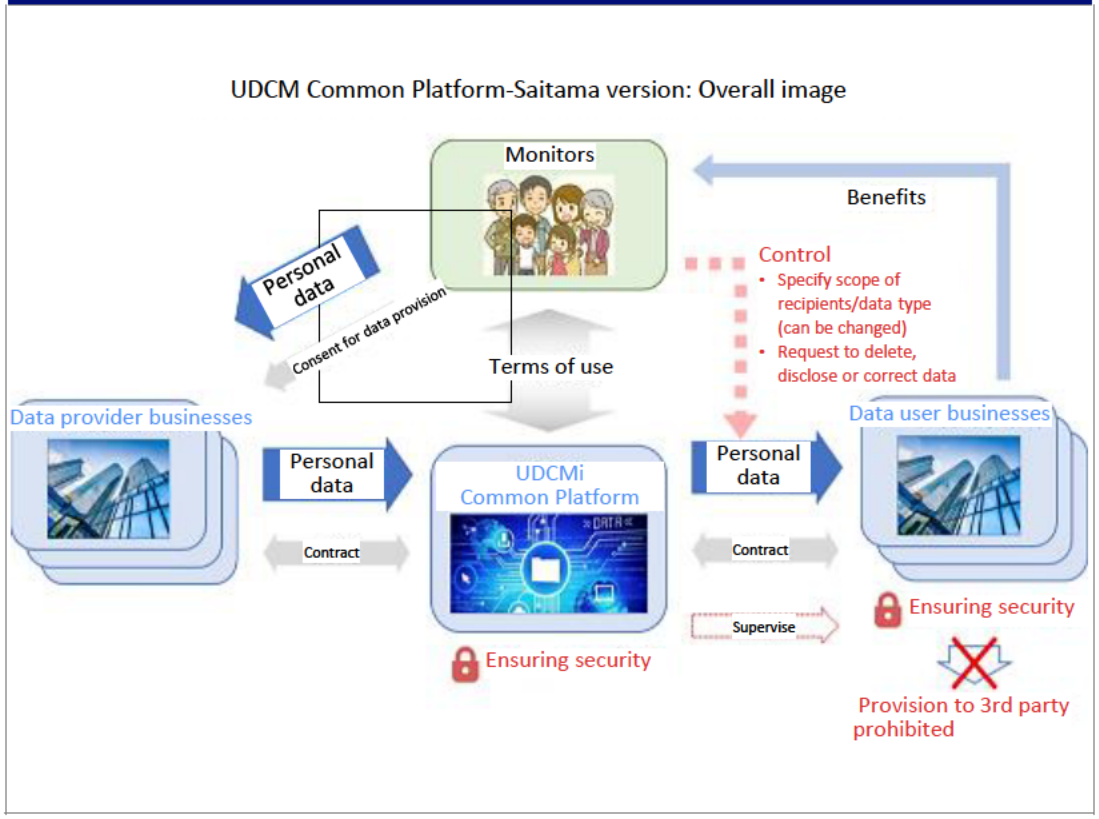
➢ Upgrade regional services for every citizen through the use of personal data to improve citizens’ QOL

Contributing to greater value of personal data and new business creation by companies

➢ Raise the value of personal data by diversifying and deepening it

➢ Furthermore, through personalization, support business creation by private companies, contributing to formulation of new revenue models.

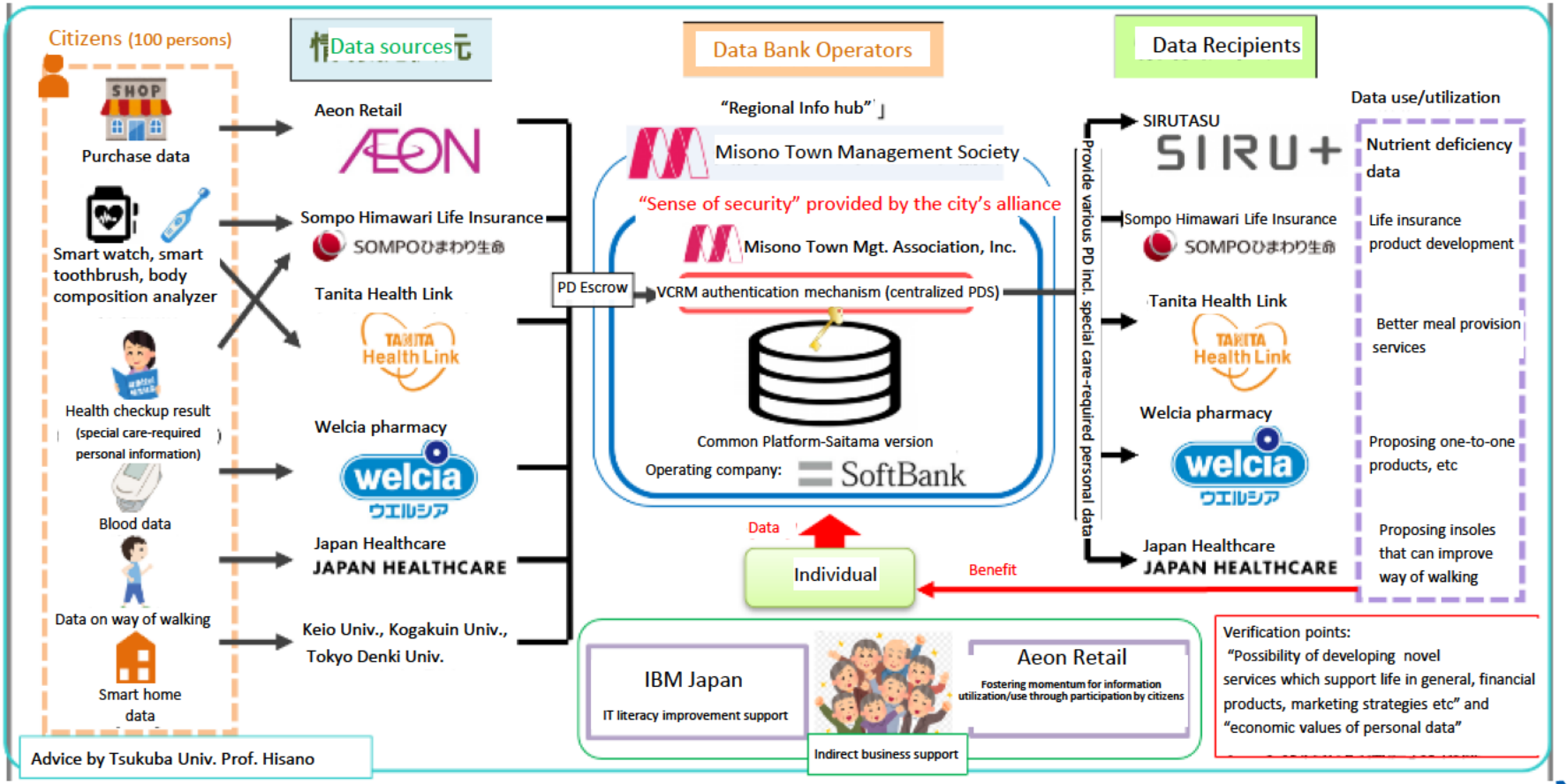
Illustration



Using personal data for healthcare services ｜ KFS (1) Development of functions and rules for ensuring safety and security when providing personal data

- As a basic function of the “Common Platform-Saitama version”, the “VCRM* authentication mechanism” was employed, which is a function that allows personal data providers to control by themselves permission to disclose designated data to designated service providers only.
- The “VCRM authentication mechanism” holds in its database the correlation between “which data and to which service provider the data provider would permit provision” and “which data service provider needs”.

Data distribution: how data being delivered



*VCRM: Vender Consumer Relationship Management

Using personal data for healthcare services ｜KFS (1) Development of functions and rules for ensuring safety and security when providing personal data

■ Civilian monitors can choose the business operators receiving their personal data and the type of data to be provided, and check the log on the business operators to whom the data is provided and on the data items that are accessed.

UI for personal data providers (civilian monitors)

Able to agree or disagree to participate in available services

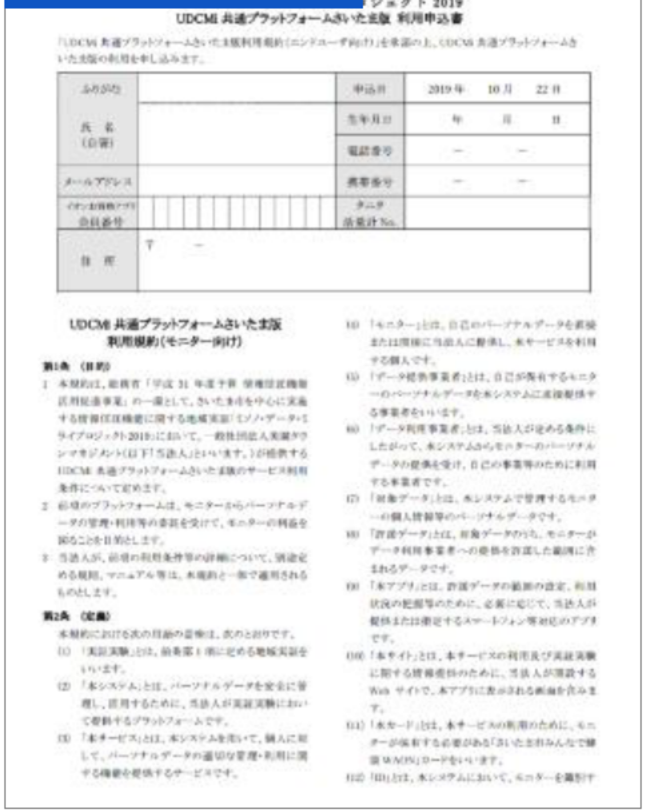
Able to check on the business operators to which monitors provide data and the accessed personal data items

Using personal data for healthcare services | KFS(1) Development of functions and rules for ensuring safety and security when providing personal data

- Terms of use of the "Common Platform-Saitama version" are prescribed respectively for the "monitors", "data provider businesses" and "data user businesses".

Terms of use of the "Common Platform-Saitama version"

Terms of use for monitors



Terms of use for data provider businesses

Terms of use for data user businesses

Reference Material UDCMi Common Platform Saitama Version Terms of Use – for Data Providers

※Excerpts from the Terms of Use

Refer to another file
「Reference Material UDCMi
Common Platform Saitama Version」

Reference Material UDCMi Common Platform Saitama Version Terms of Use – for Data Users

※Excerpts from the Terms of Use

Refer to another file
「Reference Material UDCMi
Common Platform Saitama Version」

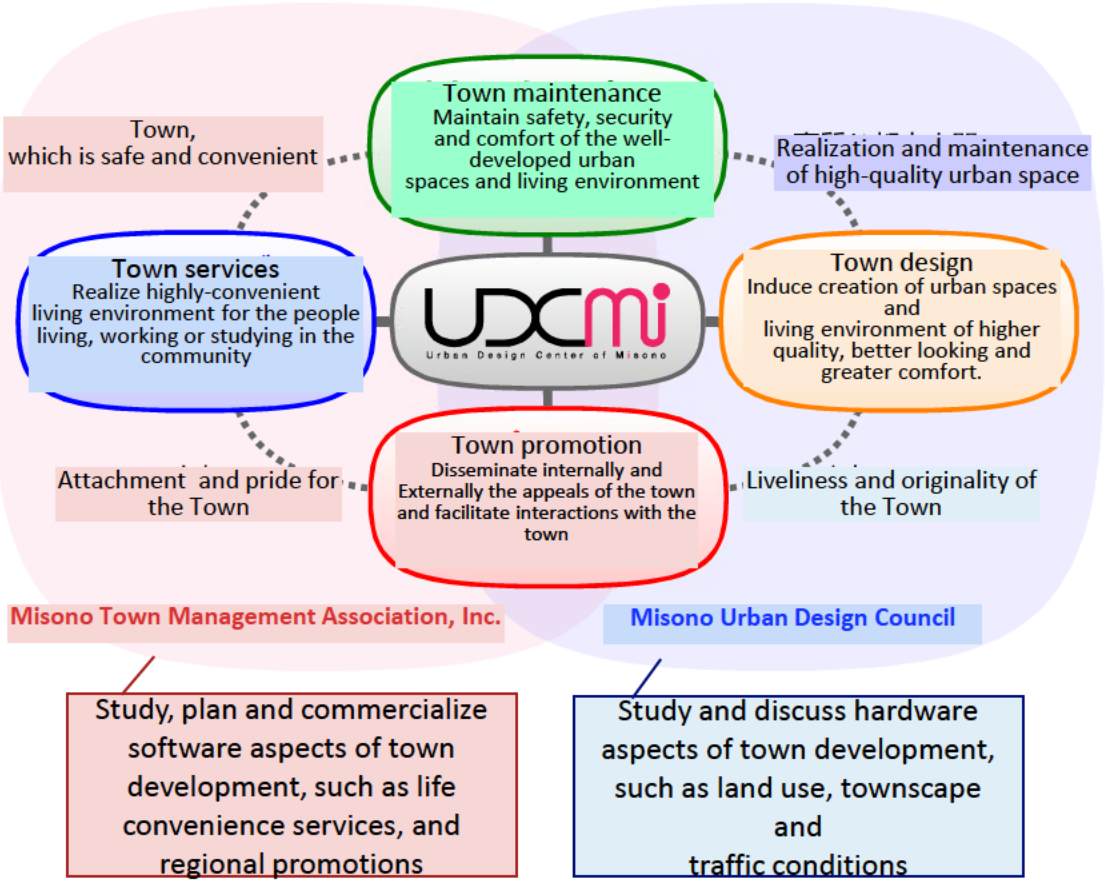
Reference Material UDCMi Common Platform Saitama Version Terms of Use – for Monitors

※Excerpts from the Terms of Use

Refer to another file
「Reference Material UDCMi
Common Platform Saitama Version」

Using personal data for healthcare services | KFS (2) Exchange views on a regular basis with the municipality serving as a hub to facilitate B2B and B2 government interactions and coordination.

Matrix Organization for town development coordination in the Misono area



- ✓ The Misono Town Management was established to run the association and the council, so that **hardware and software projects can be well coordinated** and **policies and passion to be sustained for a long time**.
- ✓ At the Misono Town Management Association, Inc. views are exchanged on a monthly basis, **leading to dialogues among businesses, and between businesses and municipalities. The involvement of municipalities as a hub can support inter-business collaboration**, we think.

Manager for promotion of environmentally-friendly city of future,
Smart City Group,
Future City Promotion Division,
Saitama City

Energy/Environment | Waste disposal | Waste treatment model to be introduced to cities abroad

Background/ Issues

- ✓ Municipalities in Japan have been consistently making efforts after WWII to achieve consensus of residents for introduction and maintenance of waste disposal facilities, which was regarded as annoyance, and such experiences have been accumulated.
- ✓ Many overseas visitors show strong interest to learn as they make visits and attend seminars about our experience and knowhow regarding "waste reduction and recycle", "consensus forming with the local residents", "advanced technologies for waste incineration and power generation", and "thorough consideration for the environment".

Solution implemented

Waste treatment model to be introduced to cities abroad

KFS (1)

Providing a sense of security

- ✓ Efforts to prevent pollution (descriptions of facilities, thorough compliance with carry-in rules, enclosure tents during construction, etc)
- ✓ Information disclosure(anti-pollution standards voluntarily set up and disclosed that are more stringent than the regulations of the central and other local governments, facility tour conducted, etc)

KFS (2)

Building trust

- ✓ Conducting explanatory sessions (Numerous briefing sessions promote residents' understanding, etc)
- ✓ Establishing councils (Building trust by constantly holding council meetings before / during / after the facility construction)

KFS (3)

Consideration for communities

- ✓ Waste incineration plant design that fits in with surrounding areas, facility wall greening, local greening, etc
- ✓ Returning benefits to surrounding communities (effective use of thermal energy, opening green spaces, functional hub in case of disaster provided)

Result

- ✓ The issue related to waste cannot be solved simply by constructing waste incineration plants; however, for example, it's been reported that a case of cooperation between Clean Authority of Tokyo and the city of Moscow led to an order for a waste incineration and power generation plant placed to a Japanese manufacturer. It shows that Clean Authority of Tokyo made some international contribution to help waste disposal administration of Moscow, Russia, as they cooperated with the infrastructure export strategy of the government of Japan.

Waste treatment model to be introduced to cities abroad | Overview

Overview

- Municipalities in Japan have been consistently making efforts after WWII to achieve consensus of residents for introduction and maintenance of waste disposal facilities, which was regarded as annoyance, and such experiences have been accumulated
- Clean Authority of the Tokyo is a special local public organization established by the Tokyo 23 wards to administer and operate waste incineration plants, etc.
- International Cooperation Department for Waste Management in Clean Authority of the Tokyo was established in 2011 so that precise response to "the requests from cities abroad and ministries of Japan" to be made, though initially, no such mechanism was planned to support municipalities abroad as to building residents' consensus
- The waste treatment model to be introduced to cities abroad was prepared for PR purpose to spread information to the cleaning entities abroad about the experience of the Tokyo 23 wards, based on three pillars of "Providing a sense of security", "Building trust" and "Consideration for communities".

Waste treatment model to be introduced to cities abroad : Purpose

The purpose is to contribute, as a municipality, to solve waste issues of the cities abroad.

- "Providing a sense of security "

  Provide a sense of security to the residents through such specific efforts for preventing pollution as giving descriptions of facilities, thorough compliance with carry-in rules and the use of enclosure tents during construction. Also by setting up and disclosing voluntary anti-pollution standards that are more stringent than the regulations of the central and other local governments, and by conducting facility tour, etc.

- "Building trust"

  By constantly holding briefing sessions and council meetings with local residents concerning waste disposal operation.

- "Consideration for communities "

  By returning benefits to the communities through adopting a design of waste incineration plant that fits in with surrounding areas, facility wall greening, area greening, effective use of thermal energy, opening green space, and using the facility as a functional hub in case of disaster.

Cleaning work model to be introduced to cities abroad | Overview

- "Providing a sense of security", "Building trust" and "Consideration for communities" for eliminating concerns, mistrust and dissatisfaction

Key feedback from the residents		Action taken	Ideal State
Concerns	• *We hear that incineration plants are dangerous. Will everything be okay?* • *Wouldn't there be harmful substances contained in the released smoke that would have a negative impact on our health?* • *Wouldn't the increased vehicles have negative impact on our environment?*	Building assurance • Effort to prevent pollution • Thorough information disclosure	
Mistrust	• *Isn't the incineration plant and/or municipality hiding negative information from us?* • *Government and municipality will make decisions without us, so we cannot trust them.*	Fostering trust • Hold briefings • Establish Councils	
Dissatis-faction	• *Construction of an incineration plant leads to negative image for our neighborhood.* • *We comprehend the need for an incineration plant, but our emotions tell us that having this built in our neighborhood is not acceptable.*	Making considerations for the community • Facility design that is in harmony with the community • Giving back to the community with free heat	**Assurance**

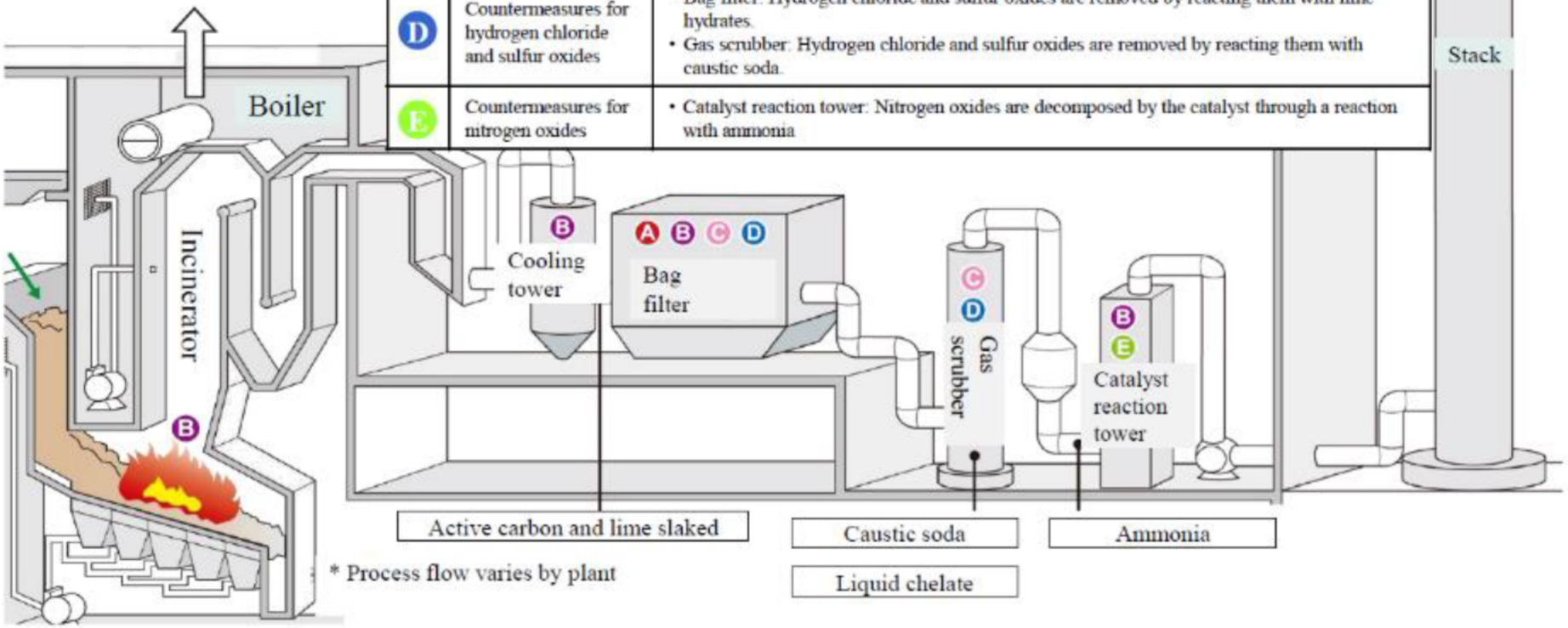
Source) Clean Authority of the Tokyo

Cleaning work model to be introduced to cities abroad | KFS(1) Providing a sense of security (1/2)

- Disclose information in an easy-to-understand manner that the facility prevents pollution while focusing on safety of the area

Measures against exhaust gas

A	Countermeasures for soot and dust	• Bag filter: Soot and dust are separated and removed by a filtration cloth
B	Countermeasures for dioxins	• Furnace room: Waste is incinerated at high temperature (800C and higher) to control the generation of dioxins. • Cooling tower: Rapid cooling is performed to prevent re-synthesis of dioxins • Bag filter: Active coal is used to attach to and remove dioxins • Catalyst reaction tower: Dioxins are decomposed by the catalyst
C	Countermeasures for mercury	• Bag filter: Active coal is used to attach to and remove mercury • Gas scrubber: Mercury is removed by liquid chelate solution
D	Countermeasures for hydrogen chloride and sulfur oxides	• Bag filter: Hydrogen chloride and sulfur oxides are removed by reacting them with lime hydrates. • Gas scrubber: Hydrogen chloride and sulfur oxides are removed by reacting them with caustic soda.
E	Countermeasures for nitrogen oxides	• Catalyst reaction tower: Nitrogen oxides are decomposed by the catalyst through a reaction with ammonia



Source) Clean Authority of the Tokyo

Cleaning work model to be introduced to cities abroad | KFS(1) Providing a sense of security (2/2)

- Provide a sense of security by voluntarily setting up anti-pollution standards that are more stringent than the regulations of the central and other local governments and constantly disclose such information as harmful substances

Compliance with regulatory standards on hazardous substances contained in exhaust gas

Item	Legal/regulatory value	Self-regulated value
Soot and dust	0.04g/㎥N	0.01g/㎥N
Hydrogen chloride	430ppm	10ppm
Sulfur oxides	91ppm	10ppm
Nitrogen oxides	85ppm	50ppm
Mercury	50μg/㎥N	–
Dioxins	0.1ng-TEQ/㎥N	–

Our self-regulated values are more stringent than the law

(Nerima incineration plant 2016)

Result of environmental measurements of all incineration plants are published at our website and elsewhere

- Exhaust gas (26 items)
- Wastewater
- Incinerated ash
- Surrounding atmosphere

- Measurement result of dioxins

Above measured data for all incineration plants are shared on our website

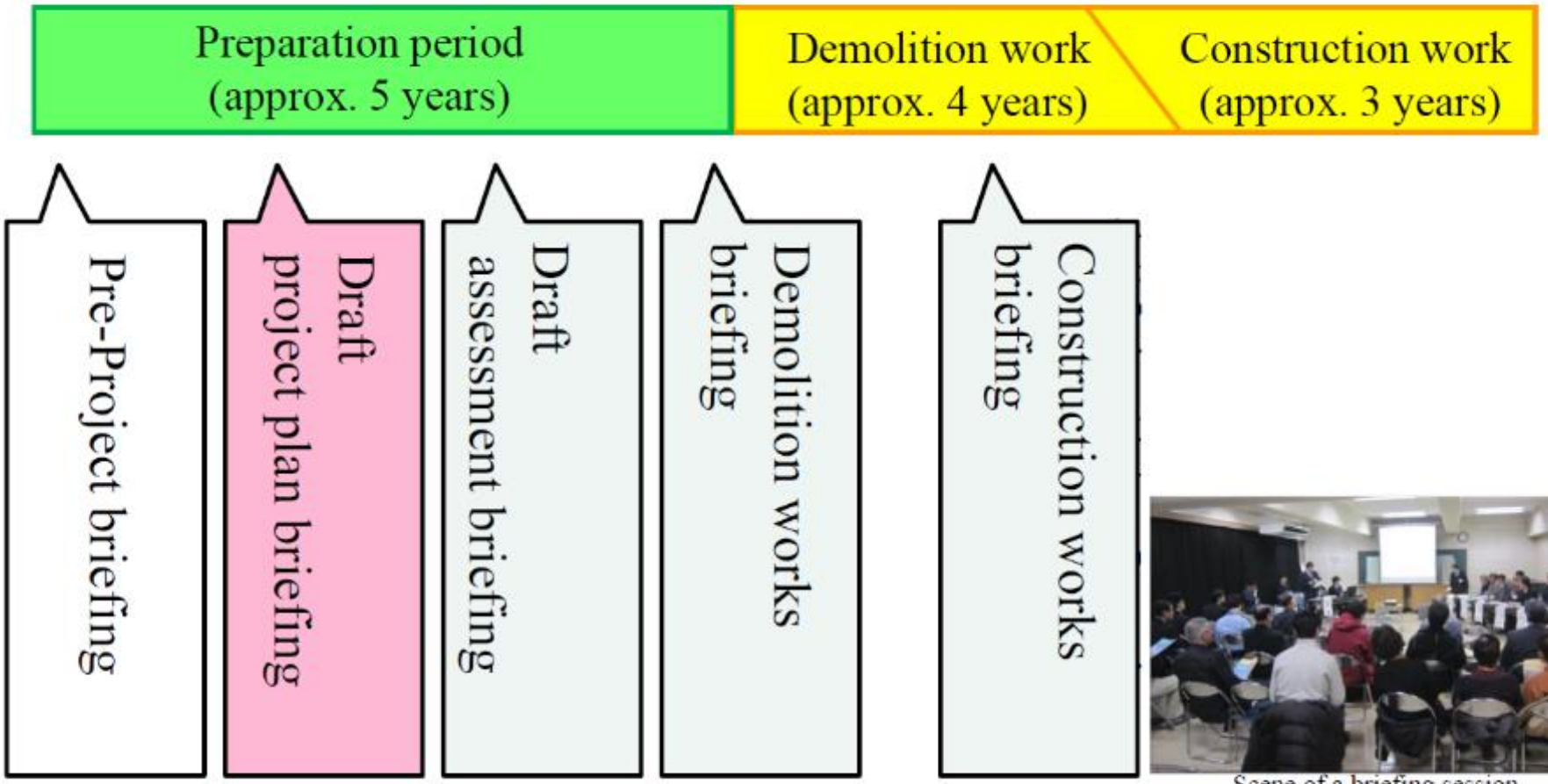
Hazardous substances in exhaust gas are measured, and displayed real time on the exhaust gas status display board which is located at the entrance of the incineration plant.

Source) Clean Authority of the Tokyo

Cleaning work model to be introduced to cities abroad | KFS (2) Building trust (1/2)

- Enhance citizens' understanding by holding briefing sessions a number of times

[Plant Reconstruction Schedule]



Scene of a briefing session
for the residents

Source) Clean Authority of the Tokyo

Cleaning work model to be introduced to cities abroad | KFS (2) Building trust (2/2)

- Building trust through council activities

Council organized with the residents

Before Incineration plant construction or plant reconstruction

Reconstruction Council

- Organized before the incineration plant is constructed/reconstructed to discuss the construction plan, etc.
- Council is comprised of residents, city officials, and Clean Authority of TOKYO staff
  - Residents are comprised of ① local town councils and residential associations, ② PTA representative of a nearby elementary, middle, and high schools, and ③ representatives from various organizations.

Scene from a plant reconstruction council

During incineration plant operations

Steering Council

- Organized before the start-up of incineration plant operation of the incineration plant, and operation status is reported on regular basis
  - This is held about twice a year, and reports on operation status are made to the residents.
  - Comments and questions from residents are answered in good faith.
  - By holding this council regularly over many years, the relationship is built with the residents.
- Comprised of residents, city officials, and Clean Authority of TOKYO staff

Scene from on steering council. Reports are made to the regional representatives regarding the operation status

Source) Clean Authority of the Tokyo

Cleaning work model to be introduced to cities abroad｜KFS (3) Consideration for communities (1/2)

- Return benefits to surrounding areas (effective use of thermal energy, opening green spaces, functional hub use in case of disaster)

Effective utilization of thermal energy

Used on site

Sold to electricity and heat suppliers

Electricity and heat providers

Electricity, heated water, etc.

Free or for a cost

Itabashi Botanical Gardens

Hot Plaza Harumi (Chuo City)

Green space is open to the public

Chuo Incineration Plant garden area ("Step Garden") is open to the neighborhood as a recreation spot

Functional hub in case of disaster

Incineration plants have agreement with Tokyo Metropolitan Government to serve as rescue activity base for rescue agencies and private lifeline institutions.

Source) Clean Authority of the Tokyo

Cleaning work model to be introduced to cities abroad | KFS (3) Consideration for communities (2/2)

- Waste incineration plant design that fits in surrounding areas

Ariake Incineration Plant

- We expected that this plant will become a landmark for the Rinkai sub-metropolitan area, and discussions were held in detail regarding the design of its exterior.
- The concept of this architectural design is a floating incineration plant, and its rectangular shape has a curved surface, giving it a light and powerful image.
- This design won the construction industry association award (BCS award), and today, after 20 years since construction, it is still one of the landmarks of the Rinkai sub-metropolitan area.

Katsushika Incineration Plant

- Selected as the top 10 nation-wide "21st Public Service Colors Award – 10 Colors of the Environment" sponsored by the Association for Color in our Public Space.
- This plant was designed based on three key ideas, which are "incineration plant that is surrounded by water and green", "incineration plant at the center of a quiet residential town", and "incineration plant for a friendly town".
- The blue of this incineration center is the color of the sky and water, and the same blue is used as the blue in communication emblem of Katsushika City where this incineration plant is located.

Source) Clean Authority of the Tokyo

Energy/environment | Water service development/operational reform | Infrastructure update/seismic adequacy improvement and wide-area coordination enhancement

Background/ issues

- ✓ Japanese water infra structure currently faces urgent issues such as less water demand with less population, deterioration of water supply facilities, delay in seismic adequacy improvement, worsening labor shortage which limits the pace of piping update from cast-iron to ductile cast-iron [anti-seismic ferrule], steel and such, and weakening of management base. However, it is difficult for municipalities to tackle these issues by themselves due to the lack of human and financial resources, etc. Therefore, the "PFI Piping Update Project" was launched to promote seismic adequacy improvement of piping by public-private cooperation.

Solution implemented

Infrastructure update/seismic adequacy improvement and wide-area coordination enhancement

KFS (1)

Launching the "PFI (Private Finance Initiative) Piping Update Project"

- ✓ HR Creation by public-private cooperation
- ✓ Development of know-how for construction management of key control points in compliance with the ISO22000 management system

KFS (2)

Water service "organizational/management integration", "facility sharing" and "management centralization" for realizing "single water service for entire Osaka prefecture"

- ✓ Osaka City positively participates in the council for revision/enforcement of the Water Supply Act, wide-area coordination, etc, facilitated by the superior administrative body (Osaka Prefecture) and the formulation of the water infrastructure enhancement plan, leading realization of "single water service for entire Osaka prefecture" through water service "organizational/management integration", "facility sharing" and "management centralization.

Result

- ✓ Accelerate the pace of water infrastructure update /seismic adequacy improvement
- ✓ Promote wide-area operation of water service and contribute to wide-area promotion of old pipe measures
- ✓ Expand the public-private cooperation experience and project know-how to overseas

Infrastructure update/seismic adequacy improvement and wide-area coordination enhancement

KFS (1) HR creation by public-private cooperation (1/2)

Public-private relationship under the "PFI Piping Update Project"

Public org (Water company)

[Roles]

Appropriately share roles with the piping update company, accomplish the mission of a water company that is responsible for citizens' safety and security, and contribute to wide-area water service as a large scale water company

[Assigned tasks]

Facility ownership, policy formulation, decisions on goals/policies/tariff, support for other cities, wide-area operations through councils, monitoring the PFI Piping Update Project

Private org (piping update company)

[Role]

Based on the goals/policies of the water company, promote piping update in a healthy, reasonable and extending manner, maximizing private-sector principles

[Assigned task]

Contribution to other cities' water services by the PFI Piping Update Project (business administration/plan/ design/construction) and concerned work based on the execution contract

Reallocation of created HR

HR creation by public-private cooperation

Quality control (ISO22000)

- Water purification
- Piping work (incl. maintenance)

(Quality control of piping update by ISO22000)

Purification plant operational control

(Control water volume/pressure in pipes after updating)

Water QC

- Water quality lab renovation

(Quality control of water in pipes after updating)

Establish PFI Project Monitoring Control Dept.

Wide-area coordination

- **Wide-are coordination, etc Promotion Council**
- **Technical support to water services of other cities**

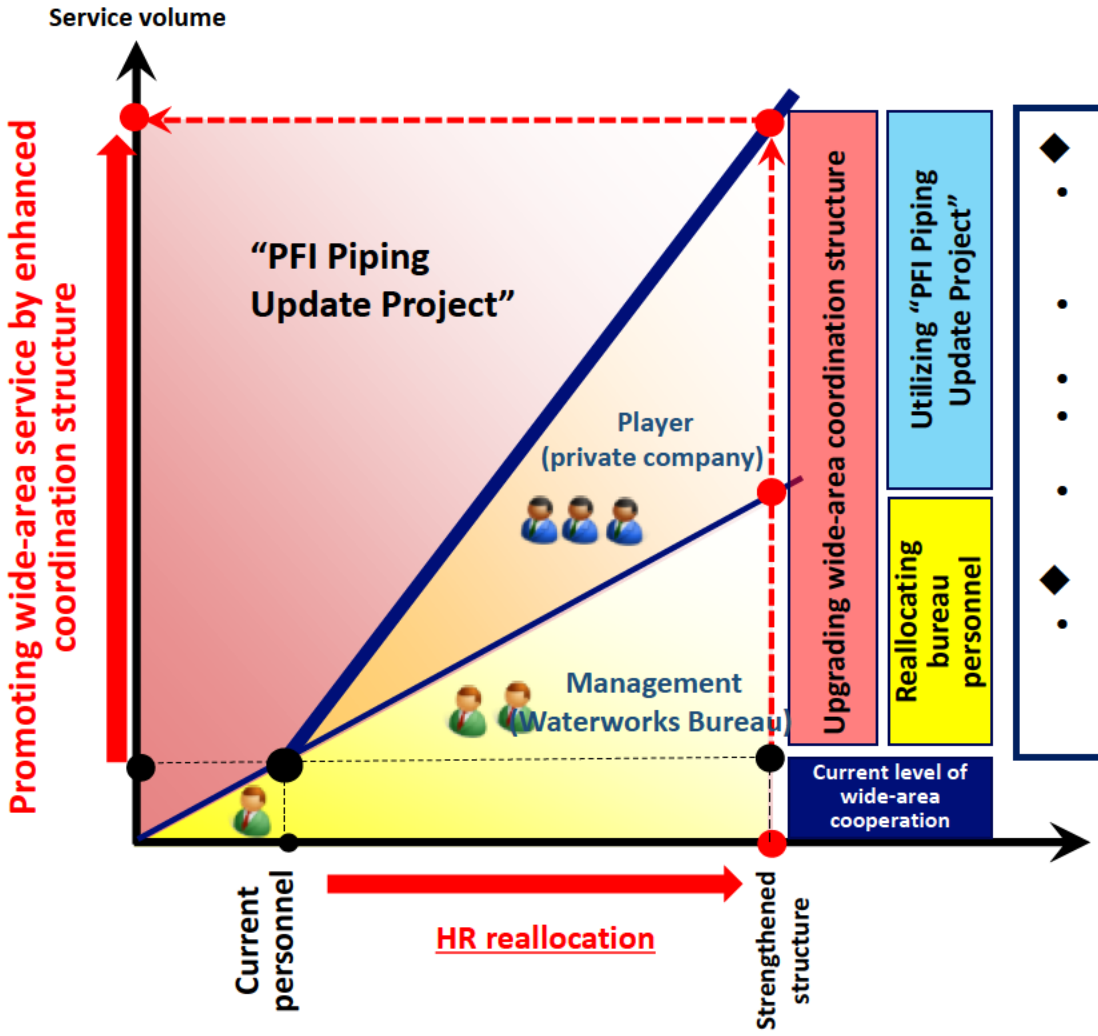
Intake/delivery piping work, Yumeshima and other new routes construction

Dispatch to private companies pursuant to the implementation contract

ructure enhancement measures by applying the revised Water Supply Act" (draft)

Infrastructure update/seismic adequacy promotion and wide-area coordination enhancement | KFS (1) HR creation by public-private cooperation (2/2)

Wide-area coordination structure by reallocation of HR created by PFI Piping Update Project of Osaka Waterworks



Description of extended wide-area coordination

◆ **Approach by government**

- Participation in the council pursuant to the revised Water Supply Act and contribution to enhanced wide-area water infrastructure
- Establish a unit dedicated to technical support to address greater needs for support
- HR support through dispatch to related companies
- Integrated support from planning stage to service implementation
- Comprehensive support for multiple tasks concerned and entire unit

◆ **Public-private approach**

- Wide-area rollout of old pipe measures in Osaka Prefecture, etc, using private companies as a platform

Example of technical support

Plan formulation

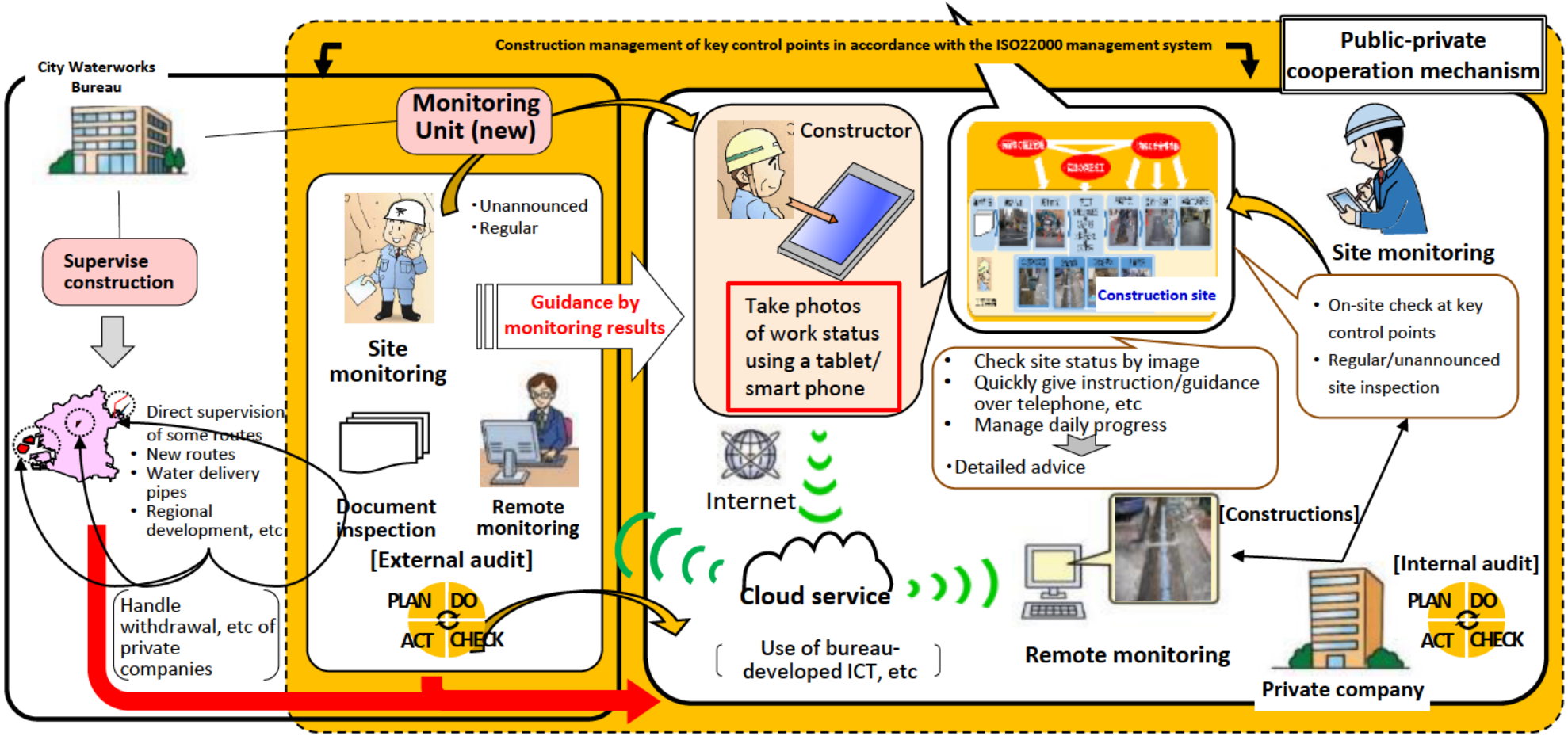
Design/construction Mgt.

Operation control

Source: Osaka City Waterworks, "PFI Piping Update Project and water infrastructure enhancement measures by applying the revised Water Supply Act" (draft)

Reference) Development of know-how for construction management of key control points in accordance with the ISO22000 management system

Construction management of key control points in accordance with the ISO22000 management system of Osaka Waterworks Bureau



Source: Osaka City Waterworks, "PFI Piping Update Project and water infrastructure enhancement measures by applying the revised Water Supply Act" (draft)

Infrastructure update/seismic adequacy improvement and wide-area coordination enhancement
KFS (2) Active involvement in the "Single water service for entire prefecture"

Strengthening of wide-area water infrastructure in Osaka City/Osaka Prefecture

Osaka Prefecture

Council for Ideal Water Service toward the Single water service for entire prefecture

1. **Centralization**
   Study optimization of prefecture water service, etc
2. **Optimal allocation, facility sharing, etc**
   Study optimal allocation of water purification plants that take in water from the Yodogawa River

Participate

Participate

Enforcement of revised Water Service Act

Wide-area coordination, etc Promotion Council

Water infrastructure enhancement plan

For a new "Single water service for entire prefecture"

- Organizational integration
- Management integration
- Facility sharing
- Management centralization

Promote old pipe measures

Osaka City

Waterworks Bureau

Implementation Contract

"PFI Piping Update Project" (private company)

[Approach by government]

Inter-municipality wide-area coordination

- ◆Plan formulation support
  - ・Regional block setup
  - ・Service scheme development
- ◆Monitoring support

[Approach by private sector]

Promote update project as players

- ◆Platform for promoting update project
- ◆Horizontal rollout under the scheme of Osaka City

Piping Update Project of municipalities in Osaka Prefecture

Source: Osaka City Waterworks, "PFI Piping Update Project and water infrastructure enhancement measures by applying the revised Water Supply Act" (draft)

Energy/Environment | Sea/river pollution prevention | Wastewater treatment improvement by development, maintenance and management of more sophisticated sewerage system

Background/ Issues

- ✓ In the area where wastewater treatment facilities including sewerage system are underdeveloped or not properly maintained/managed, wastewater from households and such would further contaminate water under the ground, in the river, ocean and so forth.

Solution implemented

Wastewater treatment improvement by development, maintenance and management of more sophisticated sewerage system

KFS(1)

Raising awareness of local residents about environment by working on the sewerage system step by step

- ✓ Trying to promote understanding of the local residents about the importance of sewerage system from the environmental pollution point of view by taking the phased approach starting from improving existing water-purification tanks toward the future deployment of sewerage system in the area not having it now.

KFS(2)

Providing technical guidance and human resource enablement for sewerage system maintenance and management

- ✓ In order to improve sewerage system maintenance and management, sustainable technical transfer should be ensured by communicating with the management, while providing technical guidance in the field.

KFS(3)

Realizing the recovery of initial investment cost in sewerage system development

- ✓ As sewerage system developed in wider area, the investment recovery should be sought by securing various sources of funds and gradually raising sewer rate.
- ✓ Brief on the long-term financial outlook and such to the local citizens and local assembly as needed

Result

- ✓ Utilizing its expertise and know-hows about sewerage system, Yokohama city contributes to solving water and hygiene issues by supporting developing nations to improve their wastewater treatment system.
(Details about overseas projects will be shown in the following slides)

Wastewater treatment improvement by development, maintenance and management of more sophisticated sewerage system | Overview

Overview

- Yokohama city is working on realization of sustainable sewerage operation in the cities of developing nations (such as Cebu City and Hanoi City) by promoting understanding of the local residents about the need of sewerage system from environmental protection point of view and developing human resources by dispatching its officers.
- Also, the city started to construct full sewerage facilities in the 60's and has made huge investment since then by securing financial sources such as state subsidies, public enterprise bonds and city tax. By latter half of the 90's, the sewerage system was nearly completed and the outstanding enterprise bonds financing facility development are steadily decreasing as a result of showing long-term financial outlook and increasing the sewer rate.

Purpose of wastewater treatment improvement by development, maintenance and management of more sophisticated sewerage system

Prevent pollution of rivers and seas and improve water and hygienic environment for the citizens

➢ Prevent environmental pollution of the water underground, in the river and se, and improve the water and hygienic environment by developing and properly maintaining and managing the sewerage system

Promotion of local residents' understanding about the need for such development

➢ Raise awareness of the local residents for environment and promote their understanding about the sewerage system development which requires huge amount of investment

Wastewater treatment improvement by development, maintenance and management of more sophisticated sewerage system | KFS(1) Raising awareness of local residents about environment by working on the sewerage system step by step

- Trying to promote understanding of the local residents about the importance of sewerage system from the environmental pollution point of view with the phased approach starting from improving existing water-purification tanks toward the future deployment of sewerage system in the area not having it now.
  - ✓ Yokohama city is cooperating with the city of Cebu with the introduction of vacuum truck and construction of sludge treatment facilities to improve hygienic environment.

Projects to raise environmental awareness of the local residents by improving water purification tank management (e.g.: Cebu city)

Vacuum truck

Sludge dewatering machine within the sludge treatment facility

Lagoon before improvement

Lagoon after improvement

※Collected sludge is separated into solids and squeezed water. Lagoon is a reservoir where microorganism degrades organic component contained in the squeezed water.

- ✓ Cebu city is rapidly urbanized with its population increasing. Early development of sewerage system is necessary especially in the central part of the city.
- ✓ However, the sewerage development requires huge amount of investment, so **it is important to build a consensus among local residents.**
- ✓ Therefore, rather than starting with the introduction of the sewerage system, **it is necessary to obtain the local residents' understanding by offering something they see the merit instantly** by starting with something simple like reducing bad odor in the area through better management of existing water purification tanks.

Yokohama city official in charge of Environment Creation Bureau

Wastewater treatment improvement by development, maintenance and management of more sophisticated sewerage system | KFS(2) Providing technical guidance and human resource enablement for sewerage system maintenance and management

- In order to improve the maintenance and management of the sewerage system, provide interactive technical guidance to the field engineers and communicate with the management level in parallel to ensure continuous improvement and sophistication of sewerage system maintenance and management
  - ✓ Yokohama city officers are sent to the city of Hanoi so that they can instruct about digitization of sewerage duct data and operation of sewerage treatment facilities. Through the discussion to support Hanoi city to develop its sludge treatment plan, Yokohama city is working on technological transfer of sewerage maintenance/management and enablement of local human resources as well as inviting and training the stakeholders from Hanoi city.

Projects for technological transfer about sewerage maintenance and management. (e.g.: City of Hanoi)

Training in Yokohama (August, 2019)

Technical cooperation promoted by on-line sessions

- ✓ The key for human resource development is targeting the right people.
- ✓ The current counterparts in the city of Hanoi are the field engineers, but from sustainability point of view, working with the management is necessary as well.
- ✓ In human resource development, **taking top-down approach as well as bottom-up approach from the field engineers' perspective is important.**

Yokohama city official in charge of Environment Creation Bureau

Wastewater treatment improvement by development, maintenance and management of more sophisticated sewerage system｜KFS(3) Realizing the recovery of initial investment cost in sewerage system development

- Yokohama city gradually started to develop drainage system after the World War II, and since the first sewerage treatment facility launched its operation in 1962, it has vigorously constructed sewerage facilities making a huge investment.
- The construction cost has been financed by various sources such as state subsidies, public enterprise bonds, and municipal fund such as city tax, of which majority came from enterprise bonds. As the sewerage facilities are used for a long period of time in the future, from the point of view of intergenerational fairness of burden, enterprise bonds, which are long-term loans, are being issued to finance facility development.
- The outstanding enterprise bonds reached about 1.29 trillion yen in fiscal year 2001, but afterwards, it has been steadily reduced to about 666.7 billion yen at the end of fiscal year 2019. This was achieved by keeping the issuance per annum within the manageable range continuously working on the following 4 initiatives.

Major initiatives of Yokohama city to recover the investment made for sewerage system development

1	● Asking the national government to extend the scope for state subsidy and making efforts to secure the subsidy
2	● Sewerage system was developed so that most of the city residents were able to utilize its service by around 1998.
3	● The sewer rate initially covered the maintenance and management cost only, but later was raised to cover the construction cost as well. ● Gradual rate increase was realized thorough explanation to the local citizens and local assembly
4	● Various cost reduction efforts were made such as seeking operational excellence and devising construction techniques

Mobility | Creating new values of local transit | Introducing of new mobility service driven by private-sector

Background/ Issues	✓ The city was interested in a new transit system that supplements the community bus that is run as a welfare service and reducing financial burdens.
Solution implemented	**Introducing of new mobility service driven by private-sector**
KFS (1)	**Establish a base/contact point for involving private companies** ✓ Founded “Future Design Shibuya (FDS)” as a industry-government-academia-regional collaboration organization ✓ Promote efforts for solving regional issues the city government is facing while involving private companies to participate in FDS
KFS (2)	**Institutional design for involving private companies** ✓ Establish and promote the public-private partnership system "Shibuya Social Action Partner Agreement” for the purpose of solving social issues
Result	✓ Promote the “good pass” project by collaboration of the FDS member companies, FDS and the local government (2021: good pass service planned to be launched, 2020: AI on-demand traffic verification test conducted)

Introducing of new mobility service driven by private-sector | Overview

Overview

- To solve the issues the Shibuya City is facing, FDS and private companies (Hakuhodo, Mitsui & Co.) collaborated to promote "Shibuya good pass", a town development service based on co-creation by community members.
- "Shibuya good pass" is a digital app service where the users can participate and support the projects in the city and use affiliated services of various kinds which make life more convenient.
- Prior to the full-fledged service implementation planned in 2021, field operational testing of the AI On-demand Transit Service, one of the Shibuya good pass services is conducted in 2020.

Introducing a new mobility service led by private business sector: purpose

Creating comfortable transit environment

By sharing community mobility, raise the degree of comfort of traveling by the community members in the city

Illustrative images of the app

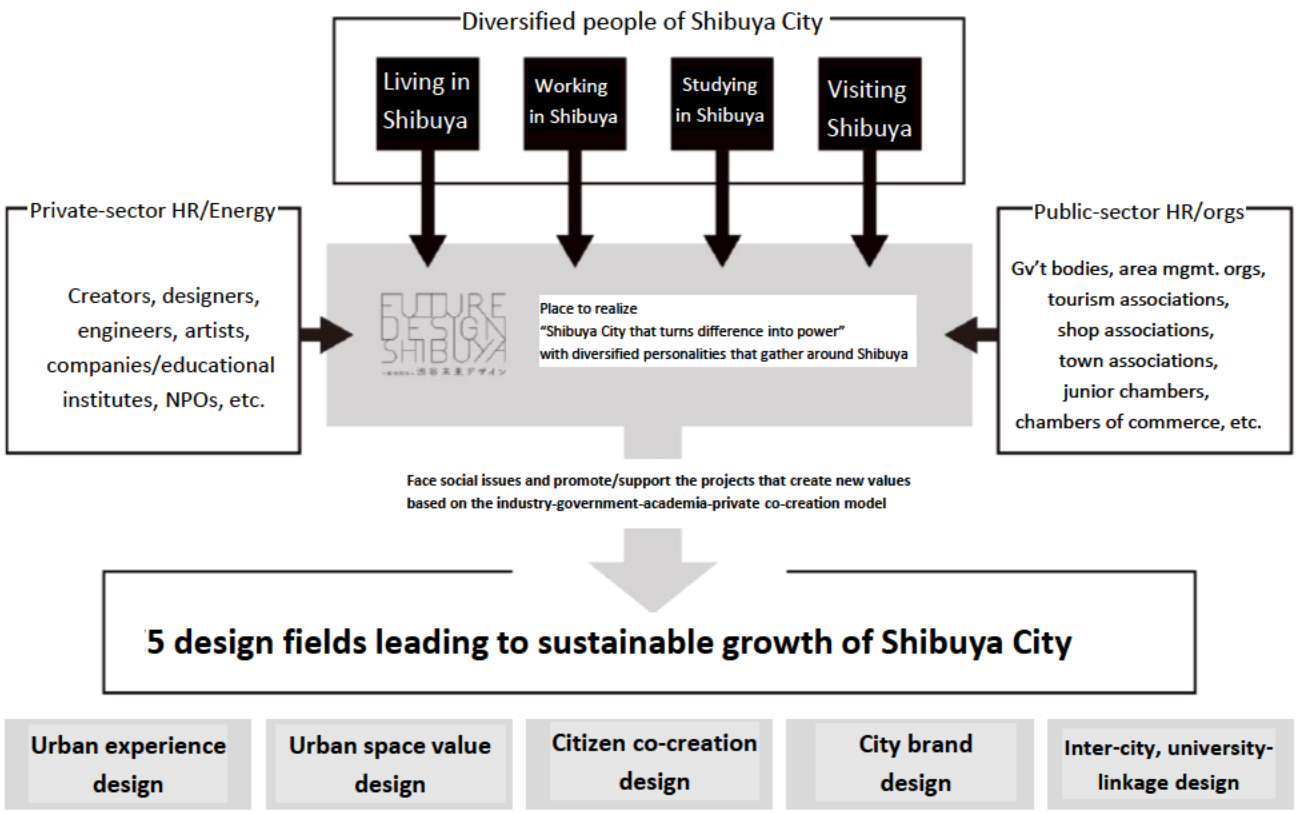
App screen :Illustration

AI on-demand service app screen: Illustration

Introducing of new mobility service driven by private-sector | KFS(1) Establish a base/contact point for involving private companies

- The Shibuya Future Design partially financed by Shibuya City (45% ownership) was founded as an organization that finds solutions to social issues and designs possibilities based on open innovation by mobilizing ideas and talents of diversified people who gather in
- The Shibuya City and private companies both in and from outside the city participate as members/partners
- FDS earns money by running projects on its own for sustainable growth of Shibuya City

Shibuya Future Design: Overview



SFD project fields

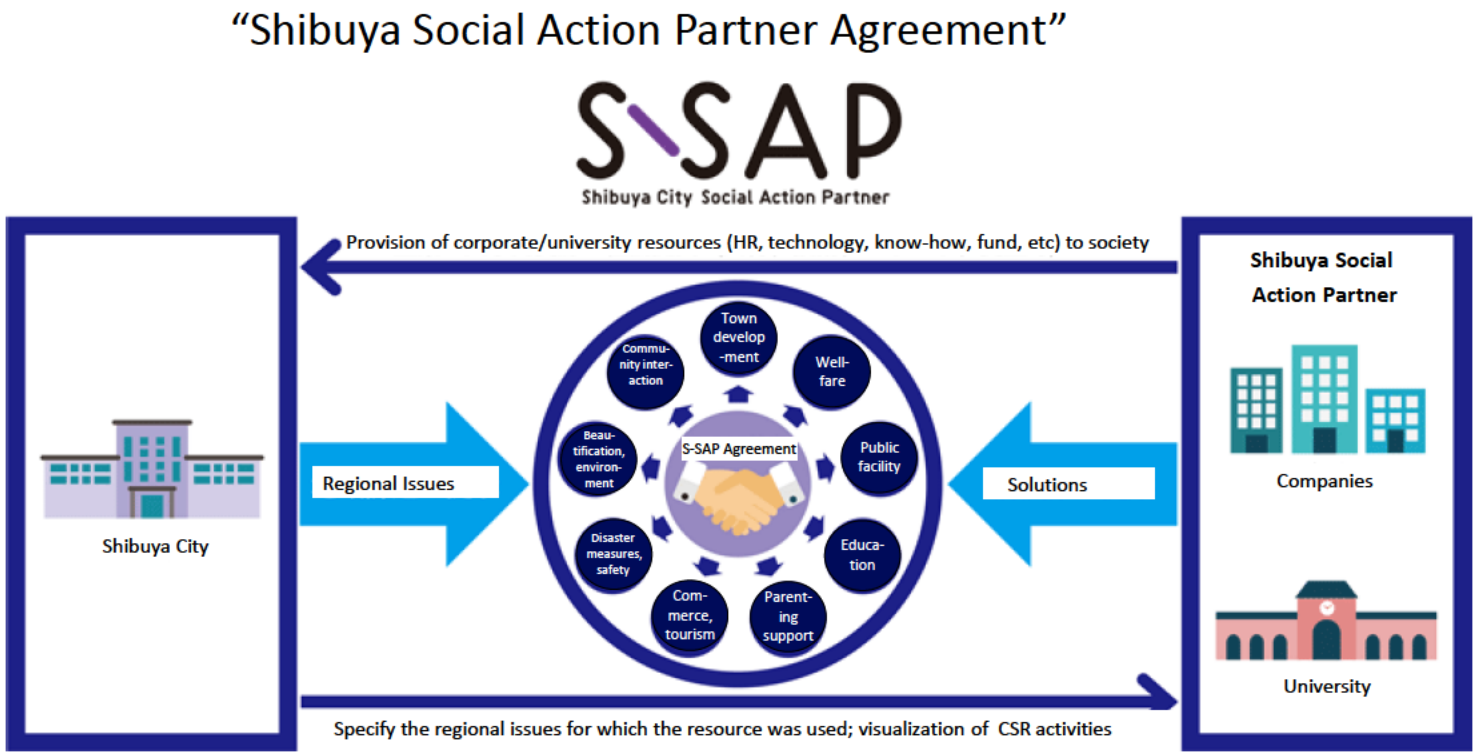
1. Creative and cultural city
2. Smart city
3. Area management research
4. Urban sports
5. Public space research
6. Diversity & inclusion
7. You make Shibuya
8. Inter-city coordination
9. Spreading information
10. Startup support
11. Business development/research

source: FY 2020 Activity Plan

Introducing of new mobility service driven by private-sector | KFS (2) Institutional design for involving private companies

- S-SAP (Shibuya-Social Action Partner) agreement is signed for the public-private collaboration to solve social issues of the community with cooperation between the companies, universities and such based in the ward and the City.
- Based on the agreement, new resident services are offered, utilizing technologies and characteristics of the companies and universities.
- As of March 2021, 21 private companies and eight universities in the city are to sign the agreement.

S-SAP Agreement: Mechanism

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