Future Realized by Smart Cities: Logistics

Issues faced by region

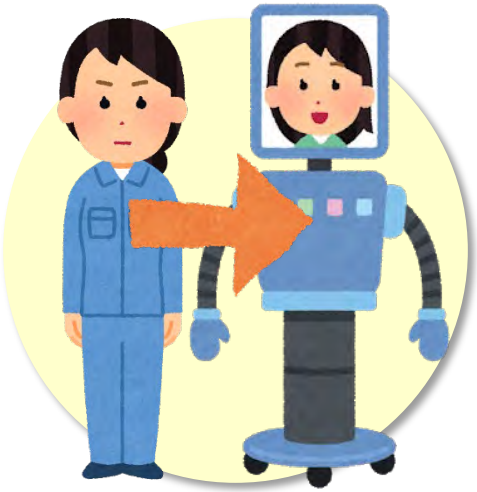
- ✓ Improved logistics efficiency
- ✓ Simplify procedures through data linkage
- ✓ Decrease in the number of people wishing to work in logistics

Illustration of Future Realized by Smart Cities: Logistics

- ○ Introduce new technologies such as robots, drones and automated trucks to **improve delivery reliability and speed, and reduce environmental impact**.
- ○ Combine various delivery methods, sharing during transportation and **reduce labor and paperless processes** from shipping to delivery and payment.
- ○ **Reduce the workload of logistics workers and address future human resource shortages** through robot technology etc.

Introduce new technologies

Labor-saving and paperless

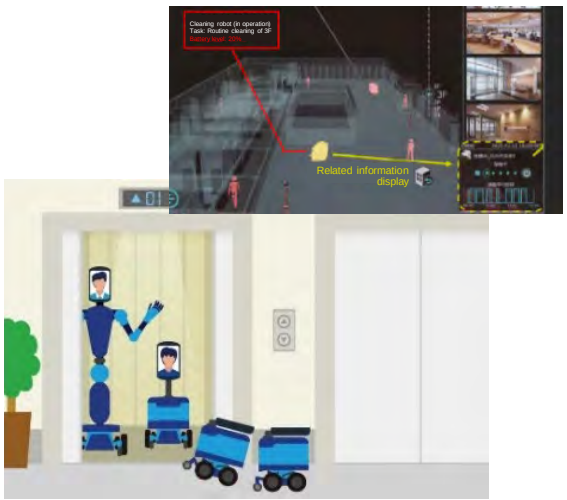


Reduced workloads and human resource shortages

Future Realized by Smart Cities: Logistics examples

Introduce automated delivery robots (Haneda Innovation City in Haneda zone 1)

Streamline delivery operations by automating the last mile in on-premise logistics from distribution centers to tenants

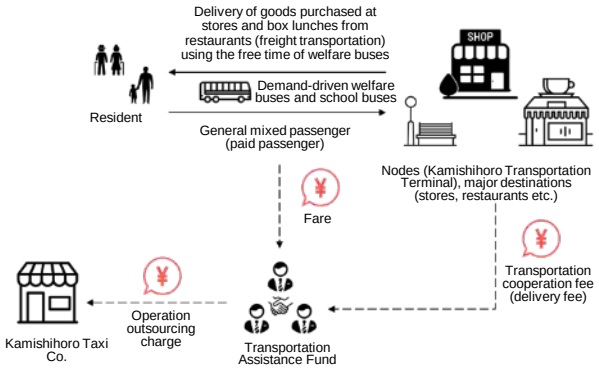


Implementing district	Haneda Innovation City in Haneda zone 1 (Haneda Airport Site Zone 1 Development Project Phase 1)
Implementing entity	Haneda Innovation City in Haneda zone 1 promotion council
Initiative outline	• Integrate and analyze the location and operation information of automated delivery robots on the spatial information in the 3D K-Field to implement efficient vehicle operation control.
Technologies and data used	• Robot moving data • Building 3D data • Data linkage platform etc.

Passenger-cargo consolidation using welfare buses etc. (Kamishihoro Town)

Implement initiatives that overlap passenger transportation and delivery businesses to eliminate traffic congestion zones and improve convenience of transportation

Future image



Implementing district	Kamishihoro Town, Hokkaido
Implementing entity	Innovation Challenge Executive Committee
Initiative outline	• Using the free time of the welfare bus, deliver goods etc. purchased by residents at supermarkets. • To realize the layering of transportation with logistics providers in the region, initiatives are being made to have people volunteer to transport people in delivery vehicles at post offices.
Technologies and data used	• MaaS etc.

Drone goods delivery flights in mountainous areas (Rakuten)

Conduct experimental delivery of supplies to mountain lodges at Mount Hakuba using drones.

Source: Rakuten website

Implementing district	Mt. Hakuba
Implementing entity	Rakuten
Initiative outline	• Demonstration experiment of drone delivery of goods from Sarukuraso at the trailhead of Mt. Hakuba in Hakuba Village, Nagano Prefecture, to Hakuba Sanso (mountain lodge) and Hakuba Summit lodge at the summit, with a maximum altitude difference of approximately 1,600 meters. • The company has also carried out drone delivery initiatives in Yokosuka City, Kanagawa Prefecture and Shima City, Mie Prefecture.
Technologies and data used	• Drone etc.

Future Realized by Smart Cities: Urban Planning and Development

Issues faced by region

- ✓ Insufficient understanding of the city as a whole through data
- ✓ Promote data-based urban planning
- ✓ Promote urban development with resident participation

Illustration of Future Realized by Smart Cities: Urban Planning and Development examples

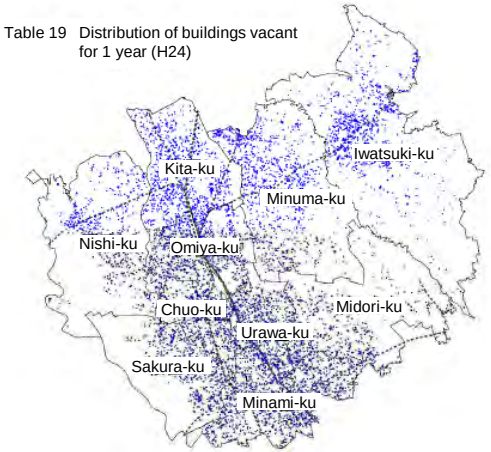
- ○ **Promote analysis by converting analog information into data and generating big data** for use in policy formulation and business planning.
- ○ **Promote openness of data** and research on urban planning in industry, academia and government
- ○ Promote active discussion and consensus building among residents regarding community development **based on data-based plans**

Future Realized by Smart Cities: Urban Planning and Development examples

Identification of vacant houses by water meter (Saitama City)

Create data on distribution of vacant buildings by deeming buildings with water meters that have not been under contract for more than one year to be vacant

Table 19 Distribution of buildings vacant for 1 year (H24)

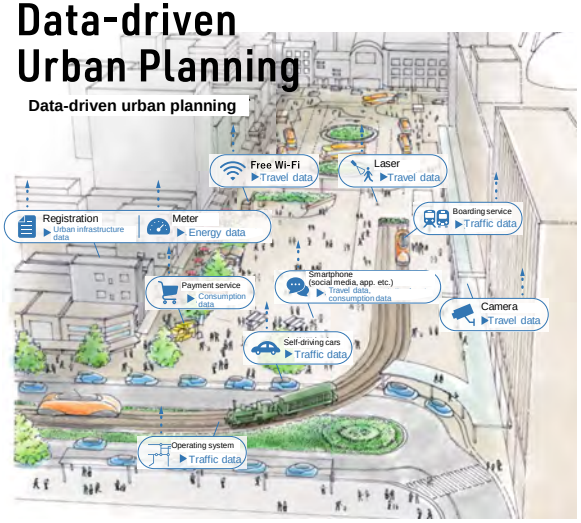


Source: Saitama City Plan for Measures against Vacant Houses etc. March 2018 Saitama City

Implementing district	Within Saitama City
Implementing entity	Saitama City
Initiative outline	• Residential, commercial, industrial and other buildings (excluding public facilities) with water meters that have not been under contract for more than one year are considered unoccupied. • Data on the distribution of vacant houses can be extracted not only for each year, but also over a certain period of time.
Technologies and data used	• Water meter data etc.

Data-driven urban planning (Matsuyama City)

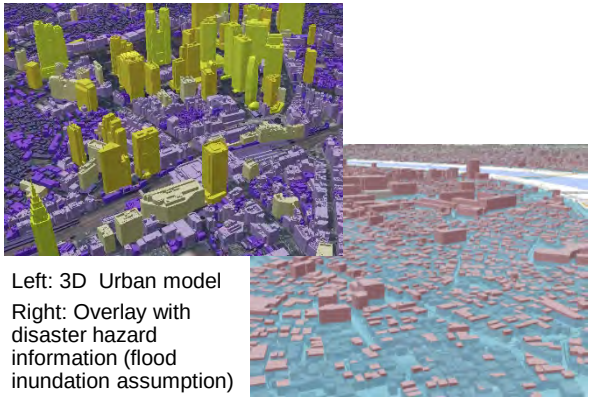
Aim to create walkable cities, improve health and revitalize communities by combining various urban data.



Implementing district	Within Matsuyama City
Implementing entity	Matsuyama Smart City Consortium
Initiative outline	• Established a methodology for data-driven urban planning using urban data sensing, urban data platform, simulation and visualization tool technologies.
Technologies and data used	• People flow data, traffic data • Simulation and visualization of traffic etc.

Project PLATEAU (Ministry of Land, Infrastructure, Transport and Tourism)

Demonstrate the advancement of urban planning, city planning and disaster prevention measures, and the creation of various urban services through the development and utilization of 3D urban models.



Left: 3D Urban model

Right: Overlay with disaster hazard information (flood inundation assumption)

Source: Project PLATEAU special website (https://www.mlit.go.jp/plateau/)

Implementing district	About 50 cities nationwide
Implementing entity	Ministry of Land, Infrastructure, Transport and Tourism
Initiative outline	• Create 3D city models of about 50 cities in Japan and converted them to open data • Establish data product specifications etc. for 3D city models in Japan for the first time • Demonstrate use cases and publish various manuals, including a collection of case studies
Technologies and data used	• 3D city model (CityGML) • Basic urban planning maps and basic urban planning survey information • People flow data, traffic data etc.

Future Realized by Smart Cities: Agriculture, Forestry and Fisheries

Issues faced by region

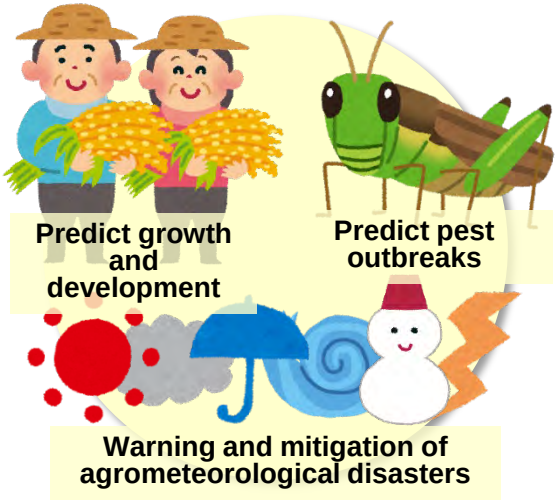
- ✓ Decrease and aging of primary industry workers
- ✓ Promote labor savings, efficiency and safety in production
- ✓ Early transfer of production know-how for the retention and expansion of new farmers

Illustration of Future Realized by Smart Cities: Agriculture, Forestry and Fisheries

- ○ **Reduce the burden of agricultural work and work hours** by automating various tasks through the use of robot technology
- ○ Accumulate and utilize data on the techniques, know-how, and judgment of skilled farmers to **improve quality and increase yields etc.**
- ○ **Reduce damage from nature** by forecasting growth, predicting pest outbreaks, and collecting and analyzing agricultural weather information

Reduce burden and work time through automation

Convert know-how into data and utilize it



Analyze data and make various forecasts

Future Realized by Smart Cities: Agriculture, Forestry and Fisheries examples

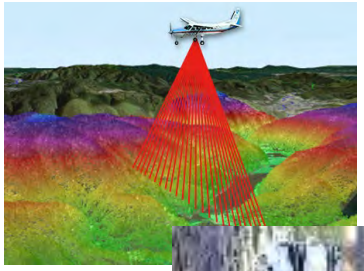
Realize 'Smart Primary Industry' (Iwamizawa City and Sarabetsu Village, Hokkaido)

Unmanned public road driving of smart agricultural machinery from multiple manufacturers through remote monitoring and control using 5G technology

Implementing district	Iwamizawa City and Sarabetsu Village
Implementing entity	Hokkaido Council for Regional Implementation of Future Technology
Initiative outline	• Amid labor shortages, strengthen responsiveness to near-future technologies to save labor and improve efficiency in production • Engage in research and demonstration for social implementation of robotic farm machines and drone utilization.
Technologies and data used	• Automated driving • Robot • Drone

Tochigi Forestry Innovation (Tochigi Prefecture)

Aim to shift to smart forestry through the use of aerial laser measurement to obtain information on forest resources and through efficient production management by the use of ICT.



(Aviation laser measurement)

(Automatic logging machine)

Implementing district	Tochigi Prefecture
Implementing entity	Tochigi Smart Forestry Promotion Council
Initiative outline	• Forestry × Future technology aims to shift from analog forestry, which is based on memory and experience, to smart forestry that utilizes digital technology. • Initiatives to reduce labor burdens through digitization and visualization of forest resource information, ICT for production management and automation.
Technologies and data used	• Aerial laser surveying • 5G • Drone etc.

Prevent damage by birds and beasts using monitoring sensors (Masuda City)

Install monitoring sensors on farmers who have installed bird and animal repelling devices to watch and collect data on birds and animals

Implementing district	Masuda City, mountainous area
Implementing entity	Masuda Cyber Smart City Creation Council, Kumamoto National College of Technology, Masuda City, Yatsushiro City Enterprise
Initiative outline	• Install monitoring sensors connected to IoT backbone infrastructure to monitor birds and animals and create data for efficient extermination.
Technologies and data used	• LPWA (Low Power Wide Area) and electric fences • IoT core infrastructure • Data linkage platform etc.