NTT Smart City Initiatives

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About NTT Group

(FY 2019)

Nippon Telegraph and Telephone Corporation (Holding Company)

		Operating Revenues	Operating Profit	No. of employees
Regional Communication Business	NTT EAST, NTT WEST	US$28.04 billion	US$3.54 billion	74,754
Long Distance and International Communication Business	NTT Communications, dimension data	US$20.08 billion	US$0.94 billion	51,580
Mobile Communication Business	docomo	US$42.35 billion	US$7.78 billion	27,558
Data Communication Business	NTT DATA	US$20.64 billion	US$1.19 billion	133,196
Other Business	Other Group Companies	US$14.58 billion	US$0.83 billion	31,951

Real estate, finance, construction/electric power, system development, advanced technology development, etc.

Number of Employees: 319,039

Consolidated Operating Revenues: US$108.34 billion

Consolidated Operating Profit: US$14.22 billion

Global Footprints (countries & regions):
Network Coverage 190+
Office Presence 80+

(using the exchange rate as of March 31, 2020)

Pillars of Medium-Term Management Strategy

Support our customers' digital transformations

1. Promote B2B2X model
2. Roll out 5th-Generation Wireless System
3. Provide personal services

Accelerate our own digital transformation

4. Enhance competitiveness in global business
5. Drive self-digital transformation in domestic business
6. Migrate PSTN to IP Networks

Leverage talent, technologies, and assets

7. Enhance and globalize R&D
8. Create new lines of business (Real estate, etc.)
9. Contribute to vitalization of regional societies and economies
10. Disaster Countermeasures

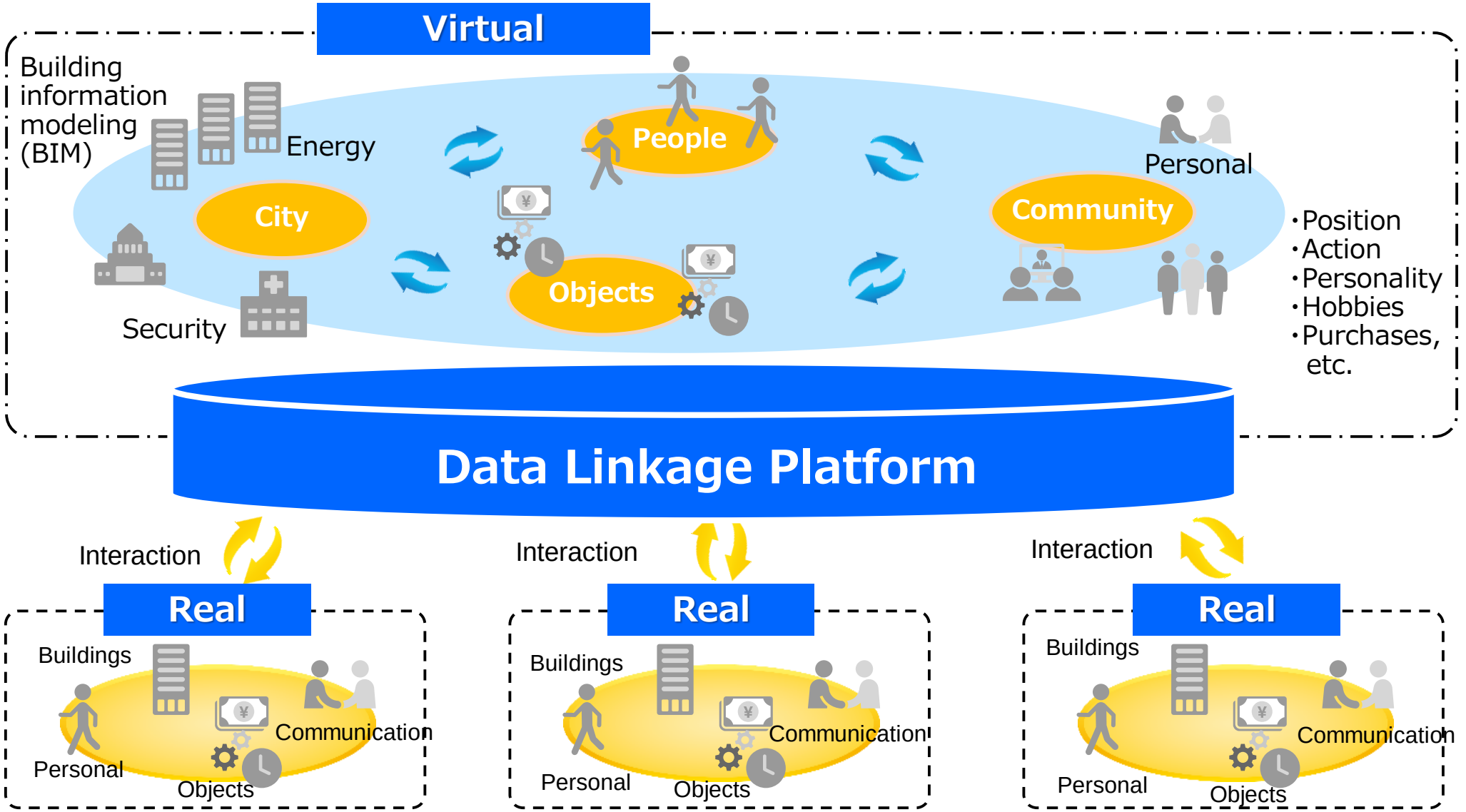
Promote ESG management, and enhance the returns of shareholders to improve corporate value

Contribute to realization of a digitalized society = Smart World

A Digitalized Society = Smart World

Our View of Smart City: Digital Twin Computing

Freely interconnect people and objects in virtual spaces, resolve social issues, and create innovative services



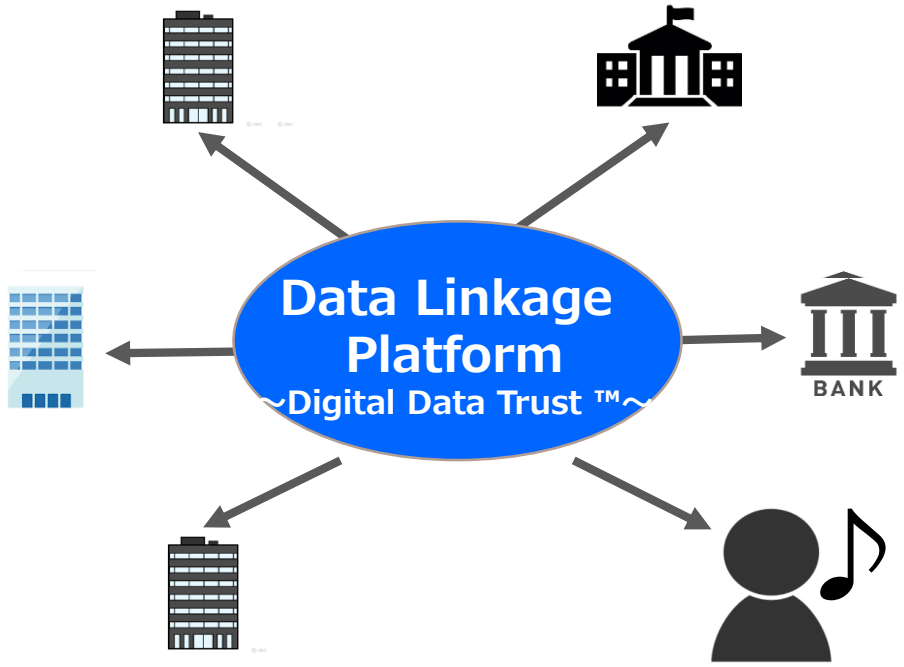
Key Points in Creating Smart Cities

1st : Redesign Society from user's standpoint
2nd : Make data public goods ("Digital Data Trust")

Society from business-operator's standpoint

Redesigning

Society from user's standpoint



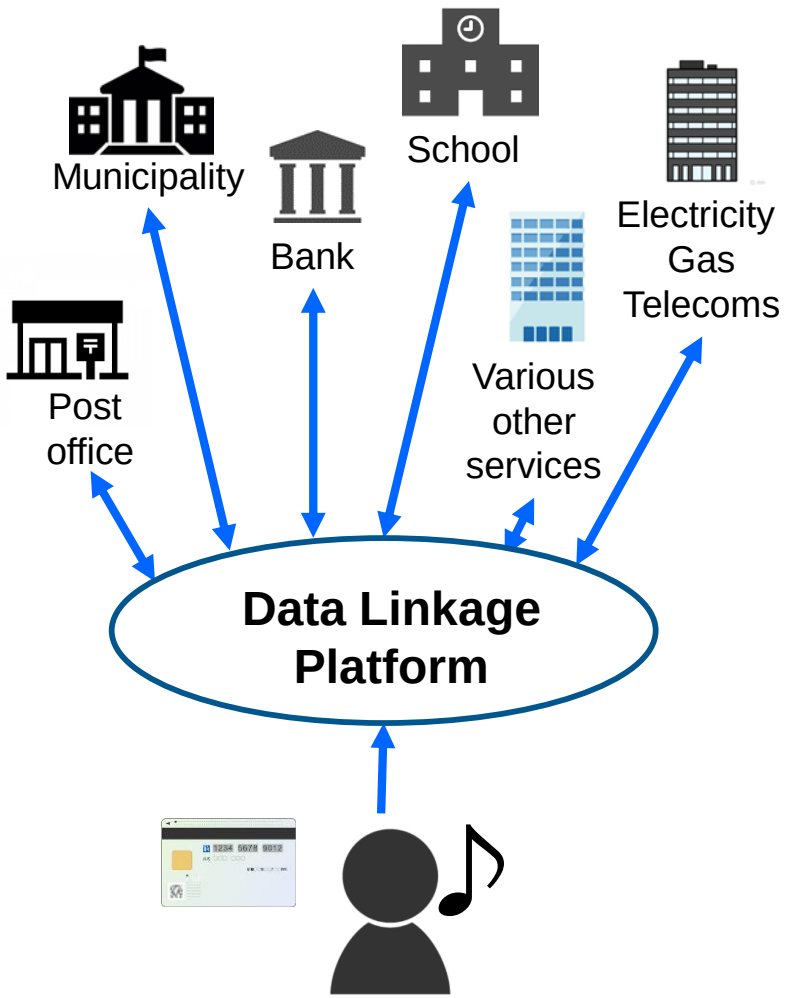
For Users

- Complex processes
- Many access points
- Time consuming

- Simple processes
- Single-stop access
- Quick

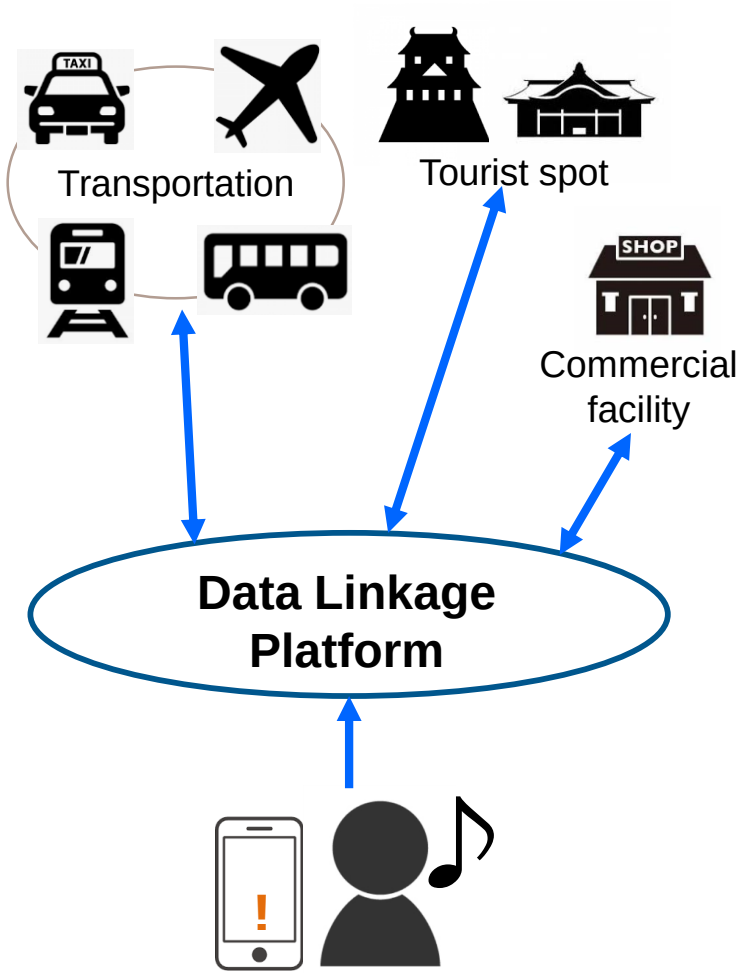
Cases: Redesign Smart Cities

Living(Moving)



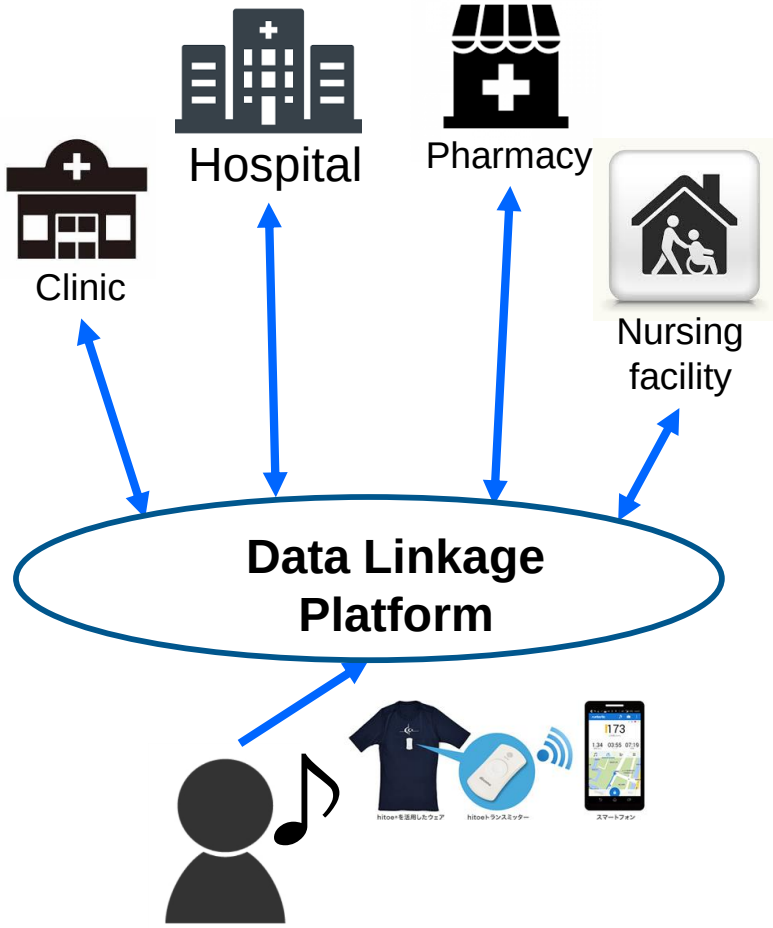
Single-stop procedures for moving

MaaS



Seamless travel and sightseeing with one digital ticket

Healthcare



Personalized medicine by sharing data among patients, hospitals, and pharmacies etc.

Major NTT Group Smart City Initiatives

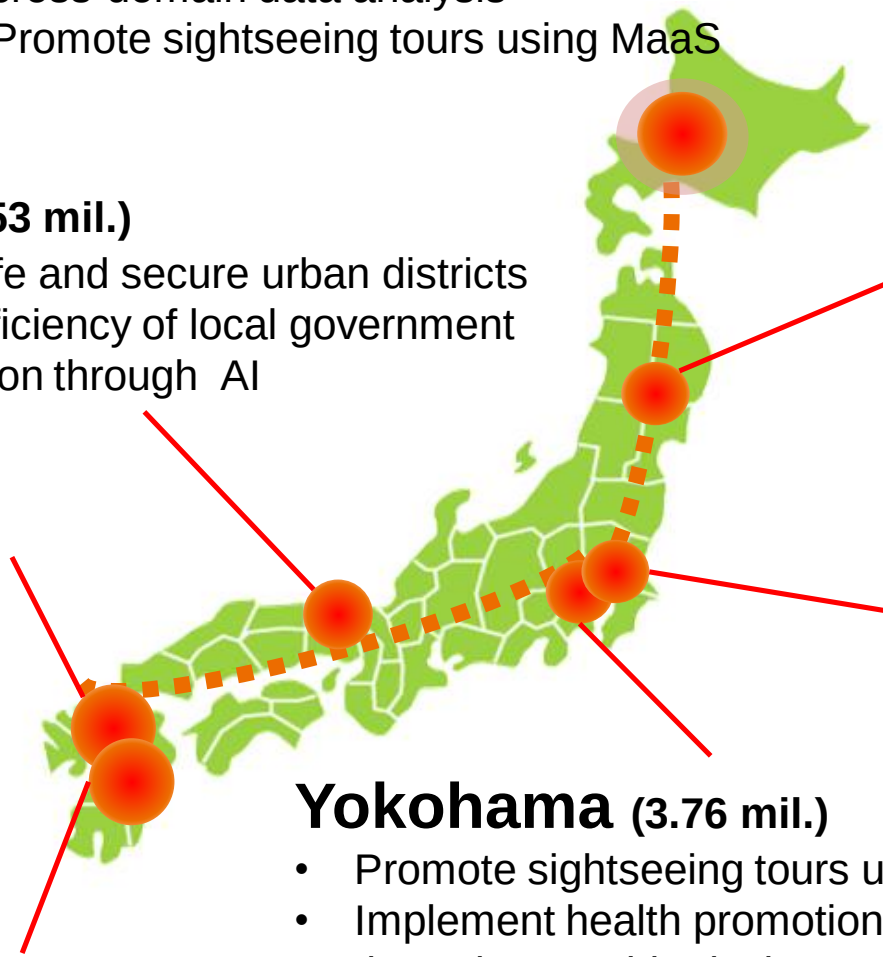
( ): population

Sapporo (1.97 mil.)
- Expand tourism business through cross-domain data analysis
- Promote sightseeing tours using MaaS

Kobe (1.53 mil.)
- Develop safe and secure urban districts
- Increase efficiency of local government administration through AI

Sendai (1.09 mil.)
- Implement disaster prevention and mitigation initiatives

Fukuoka (1.60 mil)
- Promote sightseeing tours
- Strengthen disaster response measures



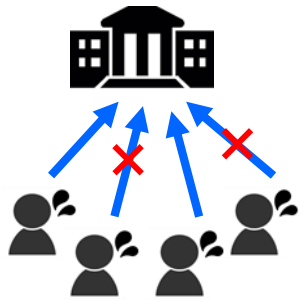
Yokohama (3.76 mil.)
- Promote sightseeing tours using MaaS
- Implement health promotion initiatives through wearable devices
- Increase efficiency of infrastructure maintenance and repair

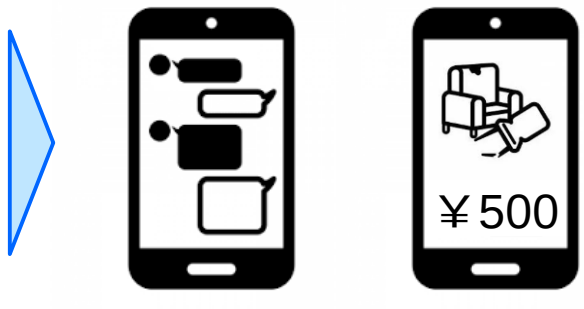
Chiba (0.98 mil.)
- Promote sightseeing tours using MaaS
- Enhance resilience through smart energy

Kumamoto (0.74 mil.)
- Resolve issues by interlinking data on flows of people with traffic data

NTT Group Initiatives in Yokohama

Living (improvement of oversized trash collection inquiry)

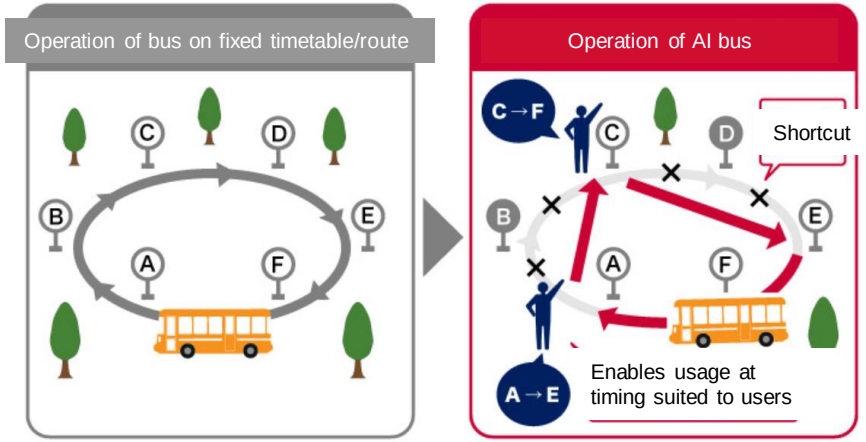




Respond to individual calls: inconvenience of limited hours for inquiries, inability to get through to call center, etc.

Improve convenience with 24-hour automated services using chatbots, on-screen confirmation, etc. Also reduces call center costs.

MaaS (promotion of transit using AI Bus)



Take a bus with ease whenever and wherever you want

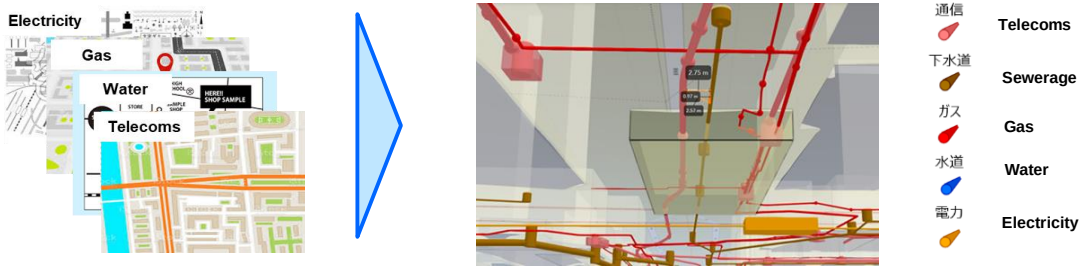
Healthcare (health management via wearable devices)

Appropriate diagnosis and treatment based on patient data

Automated management of vital data on the cloud

Automatically monitor heart disease patients' rehabilitation exercise via wearable devices. As well as enabling doctors to give appropriate advice, encourages patients to continue rehabilitation. Reduces risk of recurrence.

Infrastructure (more efficient maintenance and repair via smart infrastructure)

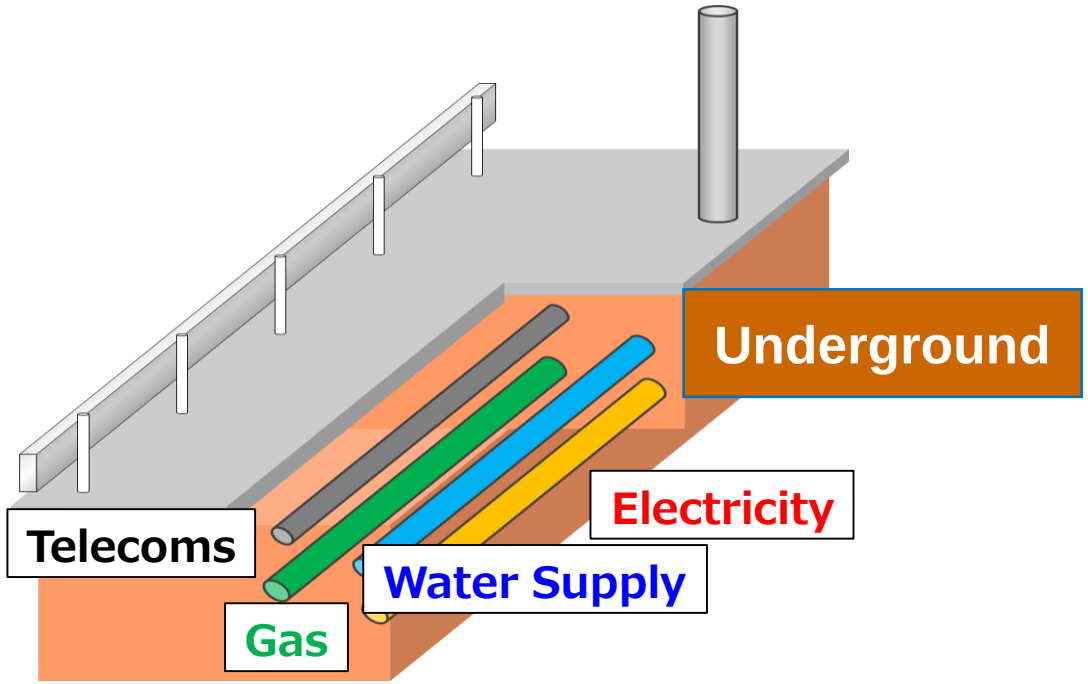


Increase efficiency through integrated management using 3D modelling of underground infrastructure facilities

More Efficient Maintenance and Repair via Smart Infrastructure

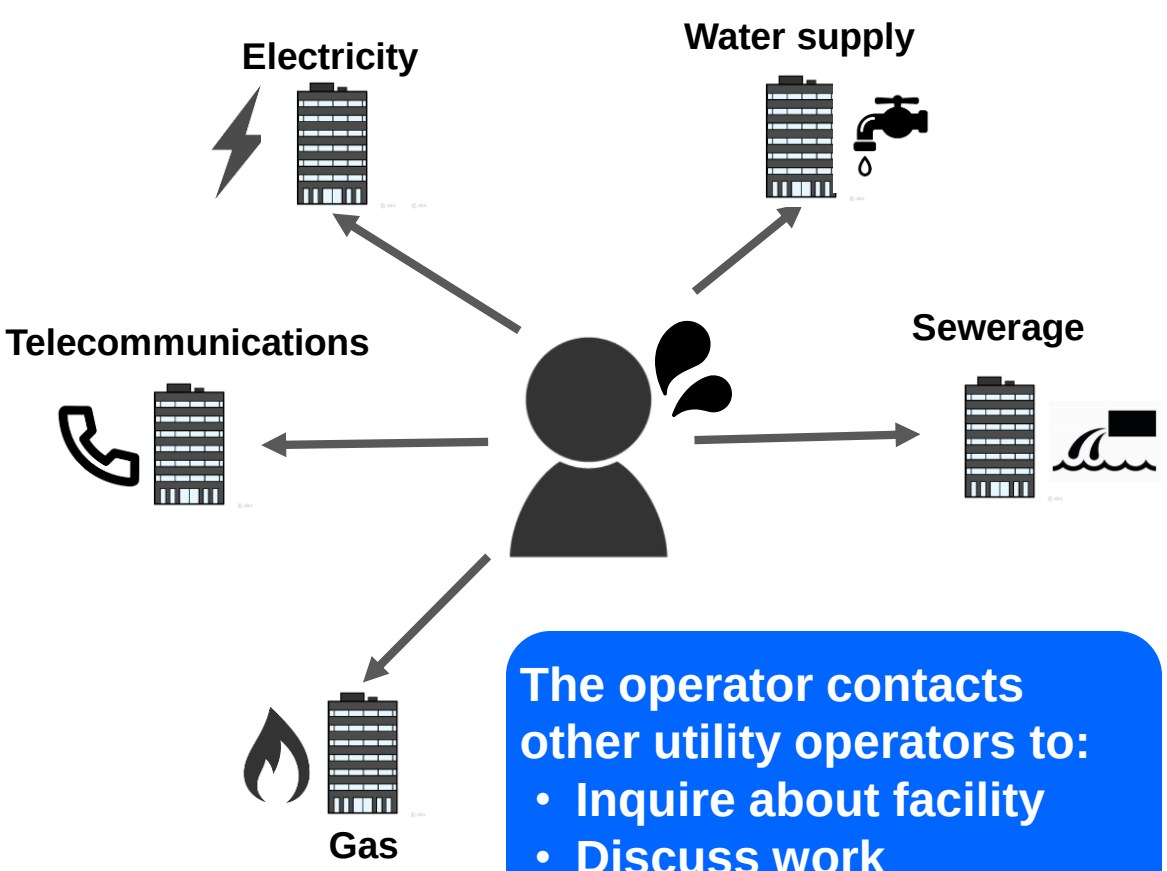
- Many utility facilities (electricity, telecommunications, gas, water supply, etc.) are laid under roads.
  - ➡ Those location information is held by each utility service operator.
- At a construction work, whole information of the underground facilities in the target area is required so as not to damage other facilities.
  - ➡ The operator has many tasks before carrying out the work.
    - Check facility information with other utility companies
    - Discuss and request a site visit

➡ The project goal:
Make it more efficient



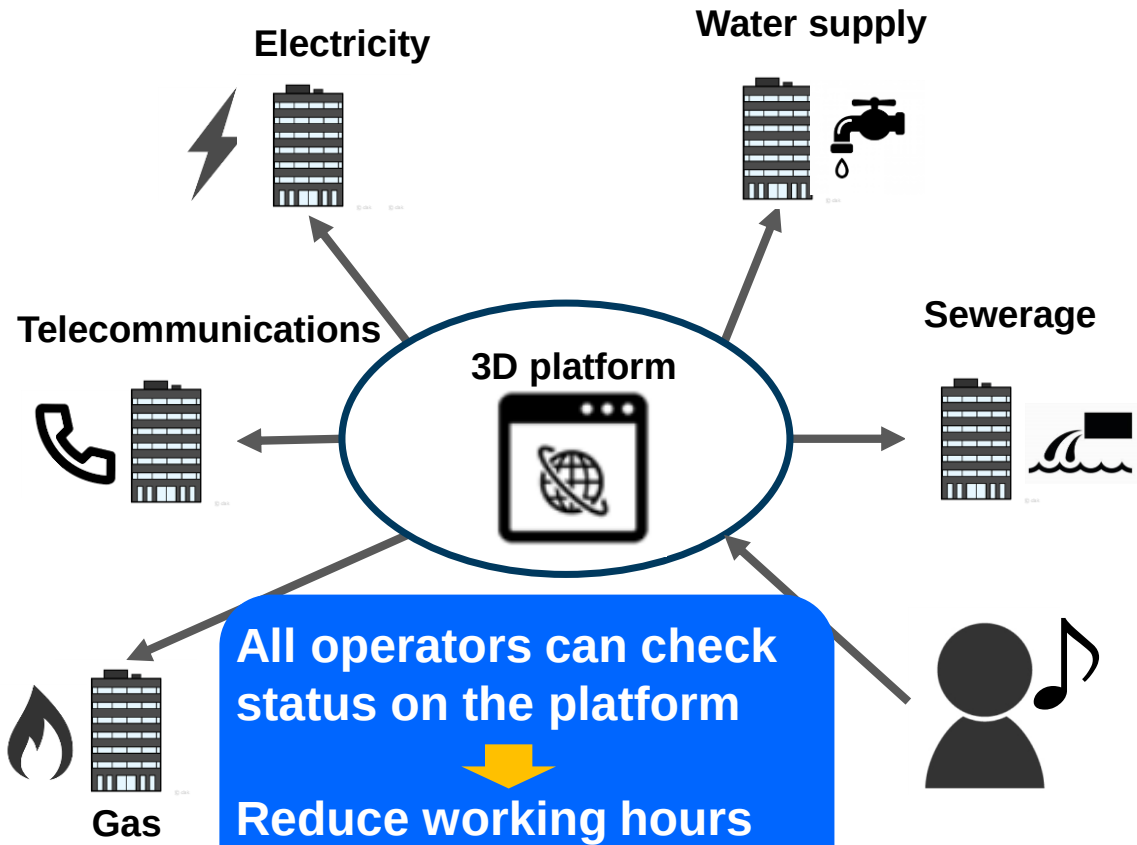
More Efficient Maintenance and Repair via Smart Infrastructure
—Facility Management through 3D Modeling —

Each utility service operator manages its own information



The operator contacts other utility operators to:
- **Inquire about facility**
- **Discuss work**
- **Request site visit**

All utility facilities are managed on **3D platform**

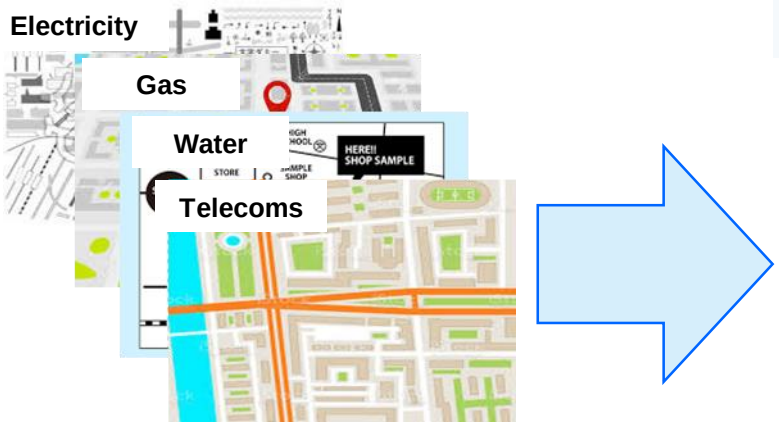


All operators can check status on the platform

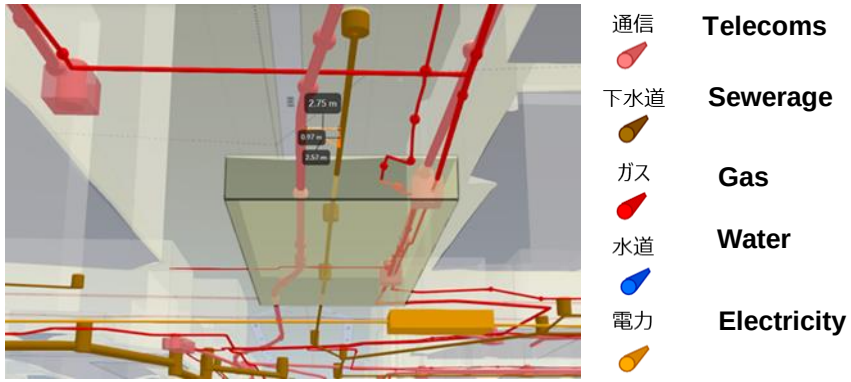
Reduce working hours for inquiries, discussions, and site visits

Effects of 3D platform

Initiative by **Kanto Regional Development Bureau of the Ministry of Land, Infrastructure, Transport and Tourism** and **utility service operators** to create 3D underground maps on the platform for the Yokohama area



Creation of 3D platform (digital twin)



Effects (estimated)

By utilizing the 3D platform (digital twin), each infrastructure manager saves labor at every step from inquiries about laying of cables and pipelines to site visits, and the number of joint works projects on underground facilities increases.

Inquiries

82%↓
(Working hours)

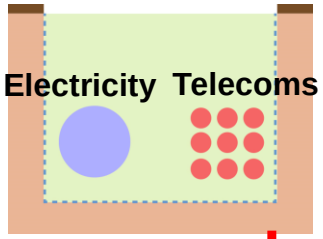
Discussions

91%↓
(Working hours)

Site visits

72%↓
(Working hours)

Construction works



50%↓
(Construction period)

Major cost-savings for both works contractors and infrastructure business operators

Looking Ahead

Confirm major effects through PoC in Yokohama

December 2020

Launch of commercialized service (Tokyo)

“Smart Infra Platform” by NTT InfraNet

Roll out to other regions