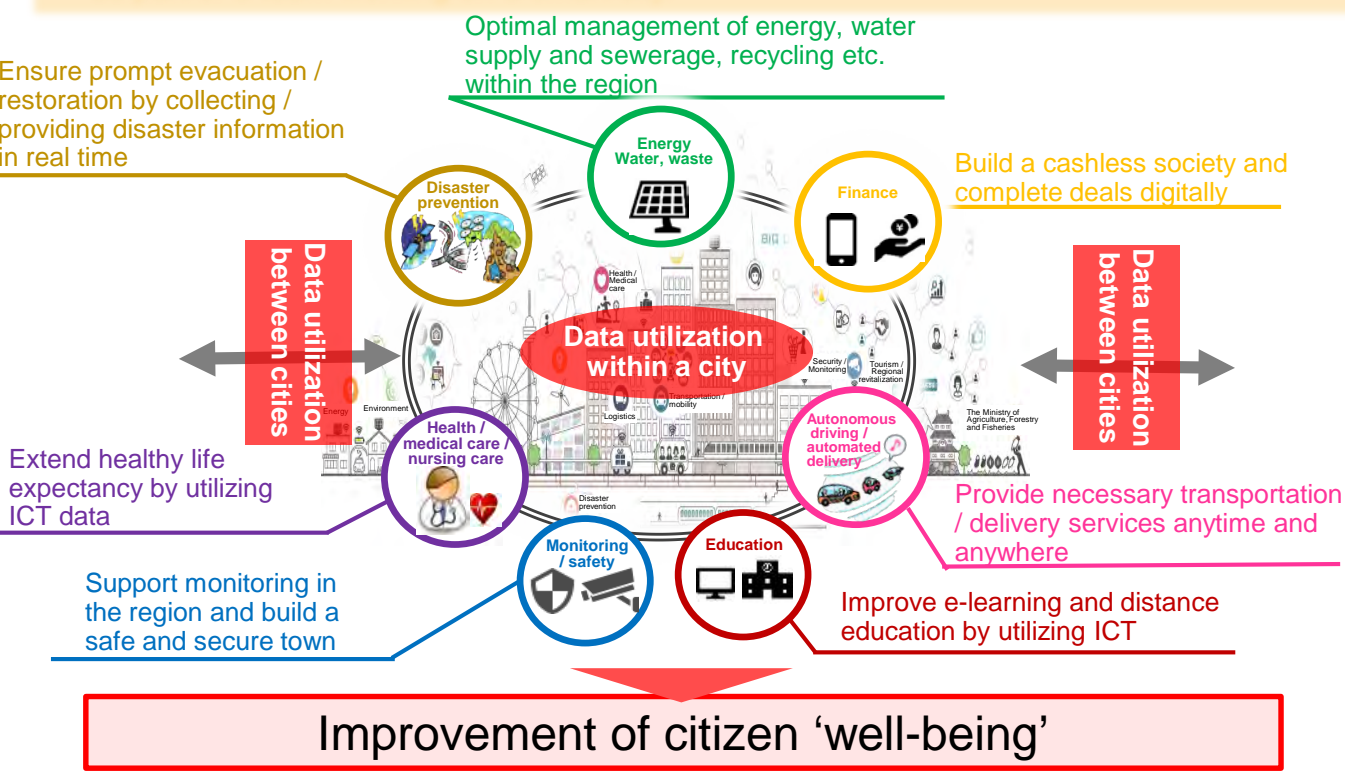# Smart City Guidebook (Outline)

Cabinet Office / Ministry of Internal Affairs and Communications / Ministry of Economy, Trade and Industry / Ministry of Land, Infrastructure, Transport and Tourism

Smart City Public-Private Partnership Platform
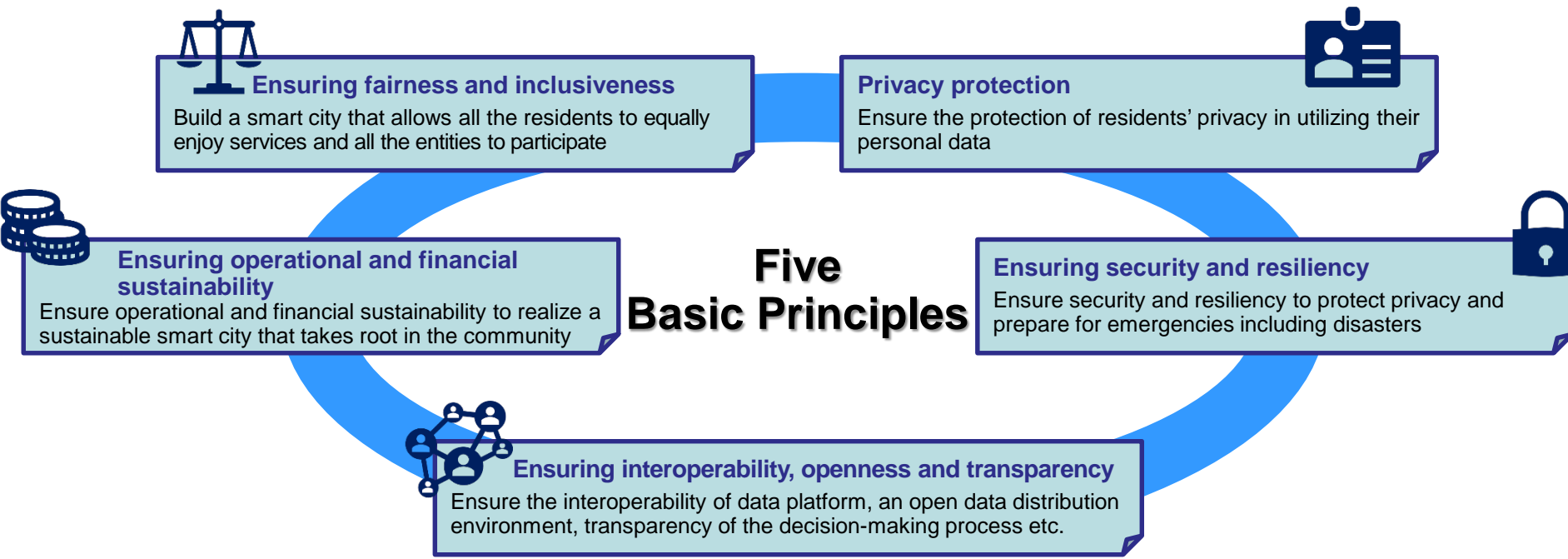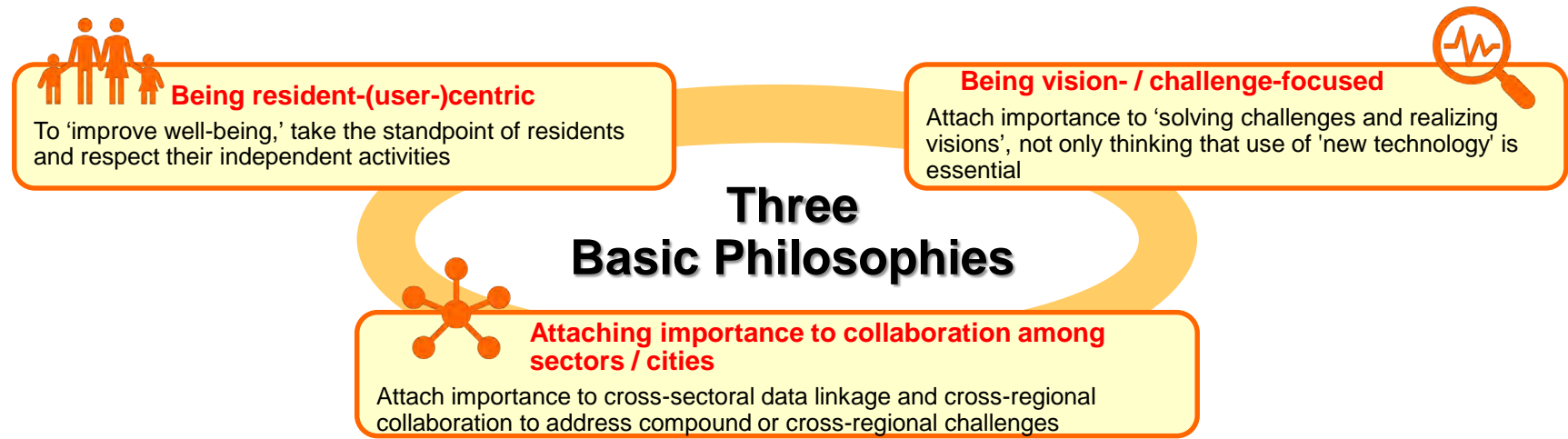
Significance of / Need for Smart City Initiatives

○ Many cities and regions are facing social challenges such as declining population, aging population, frequent disasters, risk of infectious diseases, and so on in the process of urban development.

○ While these social issues are feared to become increasingly serious, new light is also being shed on them. COVID-19 serves as a catalyst toward digitalization. Digitalization initiatives that utilize new technologies and various types of data have the potential to solve various social issues by making systems more efficient and providing services that were not possible with conventional ideas.

○ Against this backdrop, the government announced a policy of vigorously promoting the digitization of government administration.

○ This is the time to promote smart cities, not only in the governmental sector, but also in the digitalization of cities and entire regions.

○ The government is also strongly promoting smart cities that incorporate new technologies and various data applications into urban development as a trump card for achieving Society 5.0 and, ultimately, the SDGs Let's take that step forward together as part of a team working on a smart city.

Optimal management of energy, water supply and sewerage, recycling etc. within the region

Ensure prompt evacuation / restoration by collecting / providing disaster information in real time

Build a cashless society and complete deals digitally

Disaster prevention

Energy Water, waste

Finance

Data utilization between cities

Extend healthy life expectancy by utilizing ICT data

Data utilization within a city

Data utilization between cities

Health / medical care / nursing care

Autonomous driving / automated delivery

Provide necessary transportation / delivery services anytime and anywhere

Support monitoring in the region and build a safe and secure town

Monitoring / safety

Education

Improve e-learning and distance education by utilizing ICT

Improvement of citizen 'well-being'

What is Smart City?

(1) Based on the basic philosophy and principles on the next page

(2) By providing services tailored to individual citizens using new technologies and various types of data from the public and private sectors, and by upgrading management in various fields etc.

(3) Solves challenges faced by cities and regions, and continues to create new value

(4) Sustainable cities and regions

✓ The smart city concept is not limited to 'urban' initiatives, but also includes regional development (smart local) in harmony with rich nature in areas such as satoyama and satoumi ('mountain villages' and 'coast villages').

1

Basic Concept of Smart City Initiatives

Three Basic Philosophies

Being resident-(user-)centric
To 'improve well-being,' take the standpoint of residents and respect their independent activities

Being vision- / challenge-focused
Attach importance to 'solving challenges and realizing visions', not only thinking that use of 'new technology' is essential

Attaching importance to collaboration among sectors / cities
Attach importance to cross-sectoral data linkage and cross-regional collaboration to address compound or cross-regional challenges

Five Basic Principles

Ensuring fairness and inclusiveness
Build a smart city that allows all the residents to equally enjoy services and all the entities to participate

Privacy protection
Ensure the protection of residents' privacy in utilizing their personal data

Ensuring operational and financial sustainability
Ensure operational and financial sustainability to realize a sustainable smart city that takes root in the community

Ensuring security and resiliency
Ensure security and resiliency to protect privacy and prepare for emergencies including disasters

Ensuring interoperability, openness and transparency
Ensure the interoperability of data platform, an open data distribution environment, transparency of the decision-making process etc.
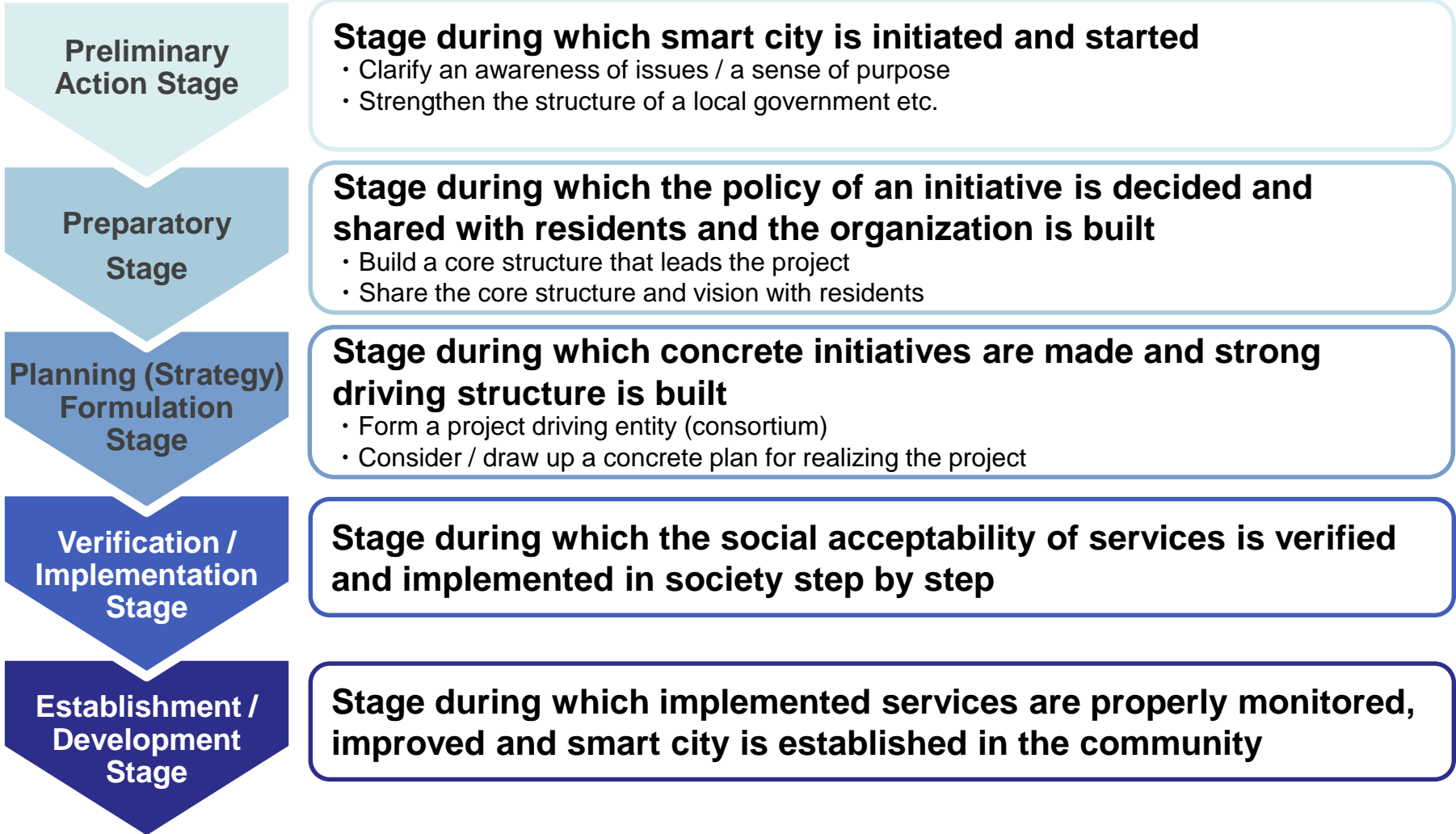
2

Types of Smart Cities

○Smart cities can take various forms, depending on the target area, purpose, content of initiatives, and entities that play a central role. This Guidebook describes the following two types of smart cities, which are considered typical.

	Government-initiated type	**Area management type**
Target area	○An area with the scale of a city or urban area	○Target specific district scale areas
Objective / description	○Initiatives that increase the efficiency of administration systems or provide various administrative services mostly to improve well-being of resident	○ Initiatives that provide services aimed at supporting the lives of community residents and the business operations of companies based in the district mostly to enhance the value of the district
Driving entity	○Consortium led by local government etc.	○ Consortium led by community development organization and a local government etc.
Major role of local government	○Supervise / lead the formation of a consortium, establishment of rules and planning (strategy) formulation as well as facilitate progress ○Provide various administrative services　　　　　etc.	○ Take the initiative in forming a consortium and planning (strategy) formulation in collaboration with a community development organization ○ Clarify the status of the district in administration plans and policies, and support the activities of community development organization
Example of initiative	Smart City Aizuwakamatsu The city will play a central role in promoting industry through the concentration of ICT-related industries, improving convenience of life by utilizing ICT, and making the city more visible.	Smart City in Otemachi-Marunouchi-Yurakucho district The Otemachi-Marunouchi-Yurakucho District Machizukuri Council will play a central leading role in the project, aiming to enhance the value of the area by updating urban functions and redesigning urban spaces through the use of new technologies and urban data.

Government-initiated type example diagram:

Aizu Wakamatsu City Comprehensive Collaborative Council for the Creation of Town, People and Work
51 organizations including the city, the University of Aizu, companies etc. (as of January 2021)

・Proposal for new business 　 ・Verification of project effectiveness (PDCA)

Aizuwakamatsu City
・Project implementation
Review of project implementation methods
・Budgeting

・Initiatives for projects in collaboration with the private sector (contributions to the Council) 　 ・Project implementation and performance reporting

Direct orders from the city

Aizu Area Smart City Promotion Council
23 organizations including the city, the University of Aizu, companies etc. (as of January 2021)
Note: Mainly locally based organizations

Aizu Area Smart City Promotion Council initiatives
・Satellite office operation 　 ・Operation of Aizu Wakamatsu+
・Operation of digital DMO etc.

Area management type example diagram:

Public-private partnership
OMY District Smart City Consortium

Share smart city initiatives and consider policies through a public-private partnership

The Council for Area Development and Management of Otemachi, Marunouchi, and Yurakucho

Area management collaboration
Each area management organization

Industry-government-academia partnership
・Relevant ministries
・Joint research with universities / research institutes etc.

Share, and collaborate in, the initiative among organizations that promote area management

Collaboration in the initiative
・Working group to prepare an urban renewal safety plan
・DMO Tokyo Marunouchi
・Tokyo Marunouchi Innovation Platform etc.

How to Proceed with Smart City

Described below are the chronological explanations of matters to do and points to note toward the realization of smart city.
- ☐ Because this Guidebook is primarily intended for local governments, explanations are focused on the government-initiated type, in which a local government plays a greater role.

Preliminary Action Stage

Stage during which smart city is initiated and started
- ・Clarify an awareness of issues / a sense of purpose
- ・Strengthen the structure of a local government etc.

Preparatory Stage

Stage during which the policy of an initiative is decided and shared with residents and the organization is built
- ・Build a core structure that leads the project
- ・Share the core structure and vision with residents

Planning (Strategy) Formulation Stage

Stage during which concrete initiatives are made and strong driving structure is built
- ・Form a project driving entity (consortium)
- ・Consider / draw up a concrete plan for realizing the project

Verification / Implementation Stage

Stage during which the social acceptability of services is verified and implemented in society step by step

Establishment / Development Stage

Stage during which implemented services are properly monitored, improved and smart city is established in the community

How to Proceed with Smart City (initial / preparatory stage)

Preliminary Action Stage

Stage of preparing for a full-scale study by setting up an agency-wide promotion system with the cooperation of expert personnel, as well as by building momentum through dialogues with local stakeholders

💡 Key points!

➤ Invite advisors / architects and other specialists to establish tripartite relationships with local governments

➤ Break down vertical divisions by building a functional and flexible internal structure, such as cross-departmental project teams etc.

➤ Have dialogues with community stakeholders, including the municipal assembly, local business leaders, regional residents' groups and local universities, and build momentum

Preparatory Stage

Stage of gathering the needs of local stakeholders and citizens based on the direction, issues, and strengths that the region is aiming for, and sharing the vision of the smart city that the region is aiming for with them.

💡 Key points!

➤ Organize local issues, key policies, resources, and strengths, and frequently absorb citizen needs

➤ Compile a vision of what to aim for in a smart city and foster shared awareness among diverse actors

➤ Benefits of data platform recognized by stakeholders

■ **Establishment of CDO and 'Digital Transformation Strategy Office' (Bandai Town)**

・Bandai-cho, Fukushima Prefecture, established a Chief Digital Officer (CDO) in November 2019

・The Digital Transformation Strategy Office, which reports directly to the Deputy Mayor, was established as a three-year time-limited cross-agency organization.
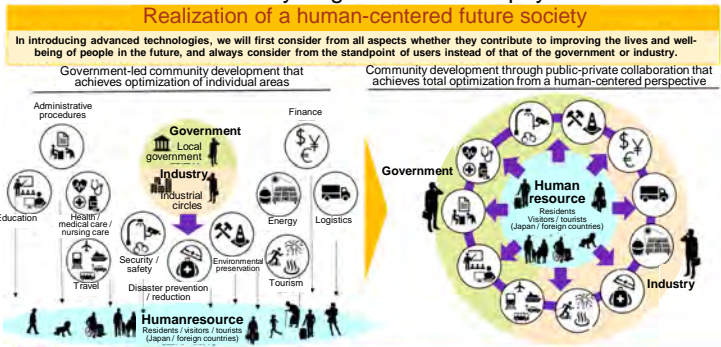

Name	Digital Transformation and Strategy Office (known by DX Strategy Office)
Bases for establishment	Bandai Town ordinance on division establishment. Bandai Town comprehensive plan
Objective	To create an attractive community where our children and grandchildren want to continue to, with a mission to co-create an inclusive society that allows everyone to live their own life
Period	An assumed period of three years from July 2020 to June 2023

■Source: Website of Bandai Town (https://www.town.bandai.fukushima.jp/site/dx/)

■ **Kaga City Smart City Declaration (Kaga City)**

・ Kaga City (Ishikawa Prefecture) announced on 30 March, 2020 the 'Kaga City Smart City Declaration' which prescribes the basic concept of 'Realization of a human-centered future society'.

Smart City Kaga Basic Philosophy

Realization of a human-centered future society

In introducing advanced technologies, we will first consider from all aspects whether they contribute to improving the lives and well-being of people in the future, and always consider from the standpoint of users instead of that of the government or industry.

Source: Kaga City website https://www.city.kaga.ishikawa.jp/shisei_gikai/smartcity/5252.html

How to Proceed with Smart Cities (planning [strategy] development stage / from demonstration and implementation to establishment and development stage)

Planning (Strategy) Formulation Stage

Stage in which a specific plan (strategy) for project implementation is formulated, led by a driving entity consisting of public, private, and academic entities that share the vision and proactively participate in the project

💡 Key points!

- ➤ Formation of a driving entity(consortium) of public, private, and academic stakeholders who share the vision and proactively participate in the project.
- ➤ Consideration of whether to implement a data platform
- ➤ Develop a plan (strategy) to identify specific paths to realize the vision

Verification / Implementation to Establishment / Development Stage

Stage in which smart cities establish themselves in the community through long-term initiatives after implementation, by enhancing maturity and social acceptance and by promoting social implementation through system introduction and service provision demonstration experiments.

💡 Key points!

- ➤ Conduct demonstration tests for implementation, not for experimentation
- ➤ Implement services etc. in a reasonable and gradual manner with the understanding of citizens
- ➤ Finalize the operation of data platform
- ➤ Even after implementation of services etc., maintain awareness of 'version up' through monitoring to improve services and introduce new services
- ➤ In addition, continue long-lasting initiatives to transform social systems and real urban spaces into ones that are compatible with a smart society

■ **Major matters that should be included in a plan (strategy)**
・Main descriptions in smart city model projects by the Ministry of Land, Infrastructure, Transport and Tourism

Goal	Goals that are consistent with the city's challenges, based on the city's vision for the future
Challenge	Describes issues facing the community
KPI	Target values and year of achievement that are consistent with the goals and challenges and that clearly demonstrate the benefits of increased value and revenue for the region.
Contents of the initiative	Overall picture of the initiative, details and characteristics of the initiative
Roadmap	Schedule for research, planning, demonstration, and implementation
Role-sharing	Consensus formation, division of roles and driving structure among the stakeholders
Sustainable initiatives	Proper public-private cost sharing, financial planning and payout time, from initial investment to maintenance and operation
Data utilization policy	Data to be utilized, data platform development and utilization policy

■ **Phased expansion of service area (Ina City)**
・In Ina City, a drone shopping service was introduced in FY2020 in mountainous areas where transportation and shopping can be difficult, using a remote control familiar to the elderly to deliver items purchased by a drone or other means.

FY2017 (Fact-finding Survey)
・Identify local issues and select high-demand areas

From FY2018 (Development / technological verification)
・Finalize drone technology development, specifications etc.
・Set up a trial campaign to 'get people to use' the product before commercialization

August 2020 (Project launch)
・The project started in four villages in Hase District (approx. 600 households)

October 2020 (Area expansion)
・Expand area to 9 villages after securing volunteers and other personnel (Approx. 900 households)

Building Functional and Flexible Driving Entities

Enhance the driving entity's ability to act

The driving entity includes various public and private players with different organizational logics and interests. There is a need to strengthen the ability to execute the project while coordinating the interests of the constituents.
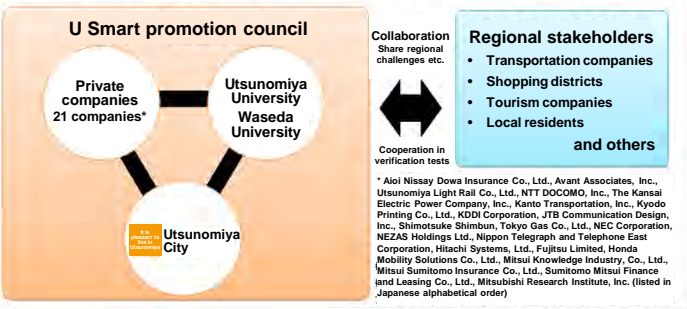
➢ Shared vision of a smart city among all constituents

➢ Secure organizations / personnel that drive and coordinate a project

➢ Clarification of governance (organizational rules etc.) to coordinate the interests of each member and ensure rational and appropriate decision-making

Clarify data handling rules

In order to distribute and utilize various public and private data, a balance between 'protection' and 'utilization' is important.

➢ Refer to various guidelines and consider data handling rules and risk management rules

➢ Clarify rules to citizens and businesses to foster understanding

■ U Smart Promotion Council (Utsunomiya City)

U Smart promotion council

Private companies 21 companies*

Utsunomiya University Waseda University

Utsunomiya City

Collaboration — Share regional challenges etc.

Cooperation in verification tests

Regional stakeholders
- Transportation companies
- Shopping districts
- Tourism companies
- Local residents

and others

* Aioi Nissay Dowa Insurance Co., Ltd., Avant Associates, Inc., Utsunomiya Light Rail Co., Ltd., NTT DOCOMO, Inc., The Kansai Electric Power Company, Inc., Kanto Transportation, Inc., Kyodo Printing Co., Ltd., KDDI Corporation, JTB Communication Design, Inc., Shimotsuke Shimbun, Tokyo Gas Co., Ltd., NEC Corporation, NEZAS Holdings Ltd., Nippon Telegraph and Telephone East Corporation, Hitachi Systems, Ltd., Fujitsu Limited, Honda Mobility Solutions Co., Ltd., Mitsui Knowledge Industry, Co., Ltd., Mitsui Sumitomo Insurance Co., Ltd., Sumitomo Mitsui Finance and Leasing Co., Ltd., Mitsubishi Research Institute, Inc. (listed in Japanese alphabetical order)
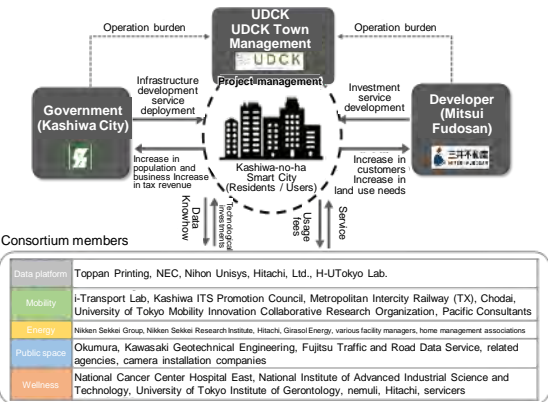
Major matters included in the statutes

○ Objectives
○ Details of operations
- Action plan development and progress management
- Investigation, study and verification testing of advanced technologies
- Project plans, budgets and settlement of accounts
○ Eligibility for participation in the council
- Support the objectives, main activities

○ Assignment and roles of officials
- Chairperson: Overall management of operations etc.
○ Establishment of the general assembly and matters for decision
- Development and modification of promotion plans, business plans and budgets
○ Confidentiality
- Handling of information on activities etc. obtained
○ Intellectual property rights
- The holders of rights are clarified in writing

■ Kashiwa-no-ha Smart City (Kashiwa City)

・Construct a management system centered on urban revitalization promotion corporations UDCK and UDCK Town Management, Kashiwa City, and Mitsui Fudosan.

・Establish a data ethics review board to strengthen governance for handling personal information.

Operation burden

UDCK UDCK Town Management **UDCK** Project management

Operation burden

Infrastructure development service deployment

Investment service development

Government (Kashiwa City)

Developer (Mitsui Fudosan)

Increase in population and business increase in tax revenue

Data Knowhow

Technological investments

Kashiwa-no-ha Smart City (Residents / Users)

Usage fees

Increase in customers Increase in land use needs

Service

Consortium members

Data platform	Toppan Printing, NEC, Nihon Unisys, Hitachi, Ltd., H-UTokyo Lab.
Mobility	i-Transport Lab, Kashiwa ITS Promotion Council, Metropolitan Intercity Railway (TX), Chodai, University of Tokyo Mobility Innovation Collaborative Research Organization, Pacific Consultants
Energy	Nikken Sekkei Group, Nikken Sekkei Research Institute, Hitachi, Girasol Energy, various facility managers, home management associations
Public space	Okumura, Kawasaki Geotechnical Engineering, Fujitsu Traffic and Road Data Service, related agencies, camera installation companies
Wellness	National Cancer Center Hospital East, National Institute of Advanced Industrial Science and Technology, University of Tokyo Institute of Gerontology, nemuli, Hitachi, servicers

Data ethics committee

Deliberate / advise on the appropriateness of the use of personal information, including the purpose of use and provision to a third party.

Background	Expected roles
Security specialists	• Provide views as well as points to note in formulating countermeasures from the perspective of information security
Law practitioner	• Provide views as well as points to note in formulating measures regarding personal information protection / privacy protection and other human rights protection (e.g. defamation, compensation for damage)
Data ethics specialist	• Provide views as well as points to note in formulating measures regarding personal information protection / privacy protection and other human rights protection (e.g. defamation, compensation for damage)

Towards financial sustainability

A major key to ensuring that smart cities take root in various regions is to ensure their financial sustainability.

To this end, the ideal is to realize a self-sustaining smart society, with a variety of public and private data circulating and private funds playing a central role.

However, the private business cycle is currently immature.

Thus, the first step is to realize smart city projects based on the first phase of the plan (strategy) developed by the driving entity and to continue to operate the data platform as a platform for data and services

Clarify beneficiaries

The various services provided through smart cities have not only direct beneficiaries who are directly related to policy issues etc. but also multiple indirect beneficiaries.

There is a need to clarify beforehand who will directly / indirectly enjoy benefits through the smart city project in considering the burden of expenses.

■ Major expenditure items

Layer	Major providers / operators	Initial cost	Operating cost
Service layer	**Government-initiated type** Local government, Corporation operating smart city*1, Private sector **Area management type** Community development organization*2, Local government, Private sector	·Cost of developing apps and systems	·Cost of updating apps and systems ·Cost of service purchase Note: If a private service is purchased
Data platform layer	**Government-initiated type** Local government, Corporation operating smart city*1 **Area management type** Community development organization*2, Local government	·Cost of introducing data platform	·Cost of operating data platform
Data layer	**Government-initiated type** Local government, Corporation operating smart city*1, Private sector **Area management type** Community development organization*2, Local government, Private sector	·Cost of installing devices such as sensors and monitors ·Cost of preparing and purchasing data	·Cost of device management renewal ·Cost of preparing and purchasing data ·Cost of data quality management

*1. Corporation operating smart city: A corporation (e.g. joint stock company, corporate juridical person) that is specifically set up under the driving entities to operate smart city
*2 Community development organization: Organization consisting of stakeholders in a specific district, including an area management corporation and a Town Management Organization (TMO) etc. , and engaging in activities to revitalize and improve the quality of the district

■ Example of clarifying those who are directly / indirectly beneficiaries

E.g.) Service for residents awarding points to walking, use of public transportation, visiting a downtown etc.

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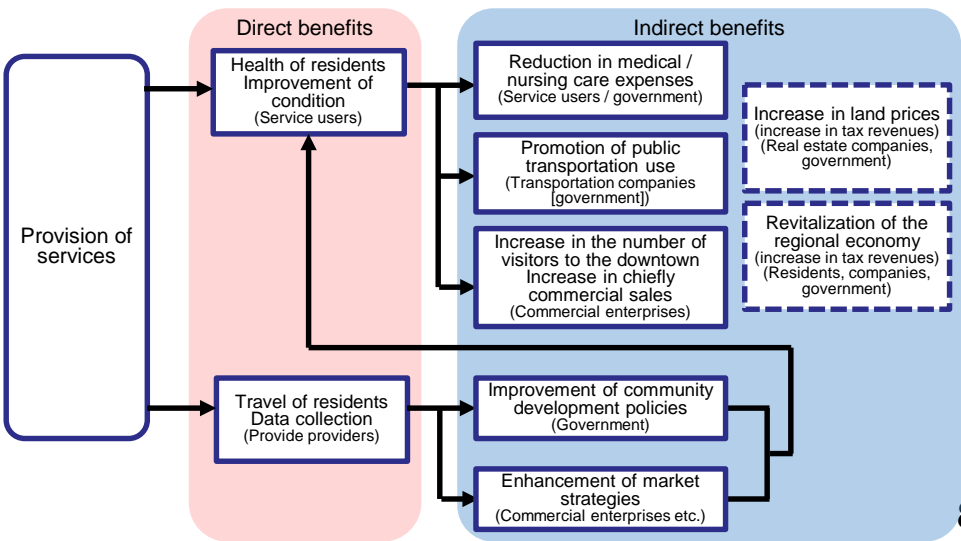
Basic ways to address the burden of cost

It is important to take various efficient measures so that services for which compensation is paid will become financially independent as much as possible.

➢ Collection of usage fees, collection of funds through utilization of collected data, collection of contributions from those who indirectly benefit from the service etc.

For other items that are not expected to be sufficiently profitable (public services, data platform layer, data layer etc.), there is a need to share costs appropriately in accordance with the direct or indirect benefits that the initiatives will bring.

➢ Reduction in administrative costs, benefits extensively enjoyed by a large number of residents and companies **…Government**

➢ Maintain and increase sales and land value by stimulating the local economy
    ....Local economic organizations, merchants, real estate managers etc.

➢ Contribution to SDGs and improvement of regional / corporate images**… Members of the driving entity**

■ **Example of cost-sharing arrangement based on benefits (government-initiated)**

Clarify beneficiaries

Entity	Direct benefits	Indirect benefits
Residents	Improvement of the convenience and comfort of life Ensuring safely and security etc.	Receiving sustainable administrative services Maintenance of / increase in income due to the revitalized regional economy
Government	Reduction in administrative costs Improvement of the quality of administrative services	Increase in tax revenues (e.g. municipal tax, business facility tax, property and city planning tax) Curbing population decrease by net migration / population increase by net migration
Providers of services etc.	Compensation for services and systems	Enhancement of the corporate brand (members of the driving entity)
Local private companies	Improvement of the convenience of administrative procedures etc. Increases in sales and production through services	Increases in sales and production due to economic revitalization
Real-estate business owners	Improvement of the convenience of administrative procedures etc.	Increases in land prices and rents due to the revitalized regional economy

<Basic direction of cost burden>

(1)Government's cost burden

➢The government bears a certain burden in accordance with the effect of reducing administrative costs and the benefits to an unspecified number of citizens and businesses through the provision of various administrative services etc.

➢It is effective to consider a variety of ways to finance / pay that are not completed in smart city
　・Outcome-linked private sector outsourcing methods (PFD/SIB), utilization of revenues from other fields, donations etc.

(2)Cost-sharing from the promotion members

➢They bear a certain burden in consideration of factors, including indirect benefits, such as the effect of the revitalized regional economy and improved regional or corporate image, and the creation of value through data sharing within the driving entity.

　・Supporting membership fees focused on economic revitalization effects etc. by regional business organizations etc.

　・Certain amount of burden focused on contribution to SDGs etc., or corporate version of hometown tax payment etc.

Active Public Participation

Need for public participation

By having each citizen actively participate in the smart city as a stakeholder, services that meet the needs of citizens will be created, and public and private data, including personal data, will be utilized more widely, leading to the formation of an ecosystem that will lead to the creation of further services.

Initiatives for active public participation

Need to first attract interest from residents and deepen their understanding.

➤ Provide citizens who are unfamiliar with smart cities with easy-to-understand information about the details and effects of initiatives from a citizen's perspective.

Need to continue long-lasting initiatives to deepen interactive dialogue with citizens.

➤ In addition to conducting workshops and public comments, also use Living Lab, Civic Tech etc.

➤ Interactive approach that ensures transparency and openness and actively invites citizens to propose their needs, policies etc.

➤ Initiatives to promote gradual citizen participation, such as starting with initiatives in familiar living spaces and building on small successes, with the help of local community development organizations etc.

■ **Living Lab initiatives (Yokohama City, Kashiwa City)**

・Initiatives to create a living laboratory, a place for social experiments in which businesses, government, citizens, and others co-create, are spreading nationwide.

Living Lab in Yokohama

■ Source: Yokohama City website, the YOKOHAMA LIVING LAB SUPPORT OFFICE website

**Kashiwa-no-ha Living Lab (tentative)**

■ Source: Kashiwa-no-ha Urban Design Center website

■ **Initiatives to identify citizen needs (Machimon, Kakogawa City)**

・Machimon (FxiMyStreet Japan) provides a system for posting, solving, and sharing street issues such as street damage, graffiti, and broken streetlights using smartphones.

・Kakogawa City in Hyogo Prefecture launched a citizen-participatory consensus-building platform (Decidim) to solicit a wide range of opinions and ideas from citizens in the formulation of its smart city concept.
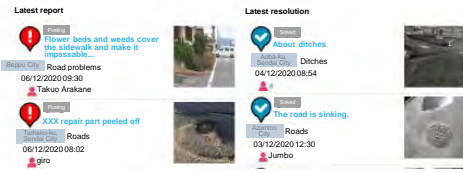
■ Source: Machimon website
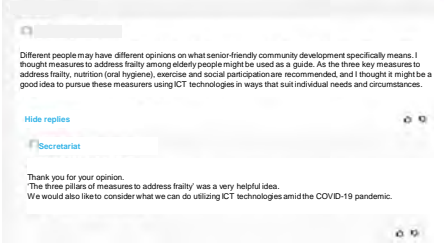
■ Source: Website of the Kakogawa City participatory consensus building platform

10

Introduction of Data Platform (data linkage platform)

Advantages of introducing a data platform

Data platform is a systematic common foundation that enables efficient collection and management of data and interoperability between disciplines / cities.

- ➢ Enable new services to be built quickly and at low cost
- ➢ Expand market size through inter-city cooperation
- ➢ Create new services and deepen existing services through interdisciplinary collaboration

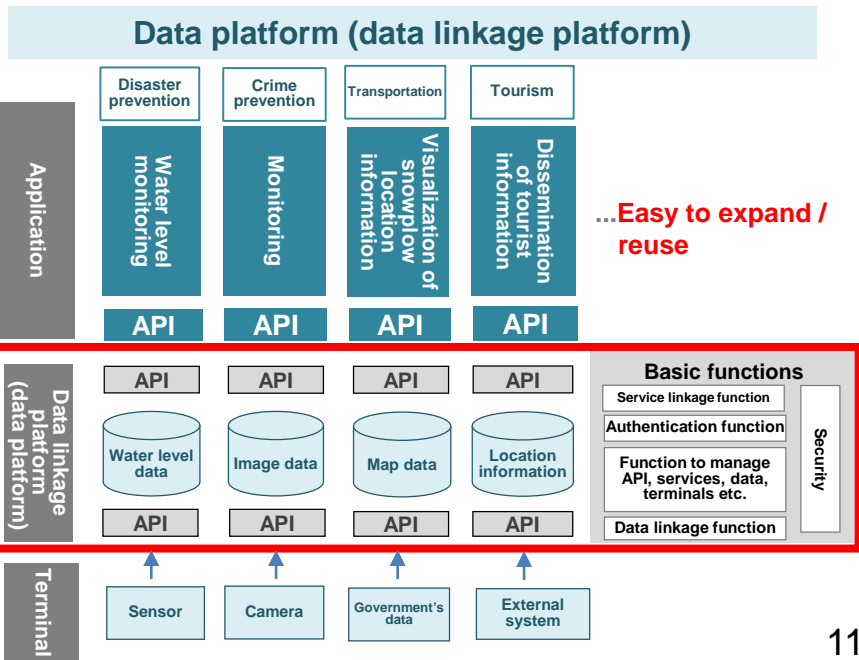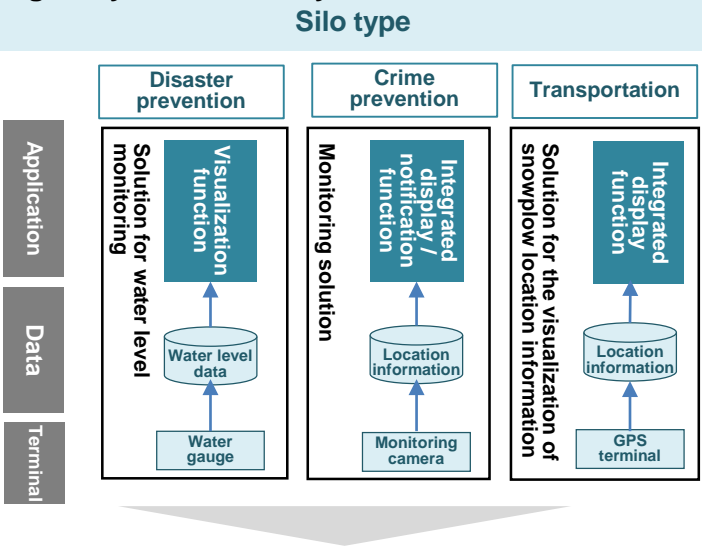## Points to keep in mind when introducing a data platform

Long-term time horizon awareness

- ➢ Data platform is part of a city planning process called smart city, which looks 20-30 years into the future. Therefore, ease of expansion and elimination of vendor lock-in are necessary.

Service / data cannot be gathered by creating data platform and waiting for it, but requires an active attitude on the part of data platform operator.

- ➢ Involve and encourage players who can develop services in cooperation with urban management and other related parties.
- ➢ Recognize the data required, search for that data, and perform matching etc.

■ Advantages of implementing data platform: Breaking away from siloed systems

Silo type

Disaster prevention	Crime prevention	Transportation

Application

- Solution for water level monitoring — Visualization function — Water level data — Water gauge
- Monitoring solution — Integrated display / notification function — Location information — Monitoring camera
- Solution for the visualization of snowplow location information — Integrated display function — Location information — GPS terminal

Data

Terminal

Data platform (data linkage platform)

Disaster prevention	Crime prevention	Transportation	Tourism

Application

- Water level monitoring
- Monitoring
- Visualization of snowplow location information
- Dissemination of tourist information

...**Easy to expand / reuse**

| API | API | API | API |

Data linkage platform (data platform)

| API | API | API | API |

| Water level data | Image data | Map data | Location information |

| API | API | API | API |

Basic functions
- Service linkage function
- Authentication function
- Function to manage API, services, data, terminals etc.
- Data linkage function

Security

Terminal

| Sensor | Camera | Government's data | External system |

11

Appropriate project evaluation(e.g. KPI)

It is important to set appropriate indicators with the 'ease of living' for citizens in mind, and to use them to explain the progress and effects of initiatives to citizens through 'visualization' of the indicators.

➢ It is necessary to set KGI corresponding to the major goals / KPI corresponding to the goals for each theme, outcome indicators to show the effects of initiatives / output indicators to show the amount of activity of initiatives

➢ It is necessary to check progress and results through regular KPI evaluations to update plans and improve projects

To end

This guidebook provides a comprehensive list of ideal procedures based on prior smart city initiatives, so it may be difficult to tackle all of them at once. Of course, it is also effective to start with the things we can do.

The preceding examples have not reached the goal, and they are working day by day to establish a smart city, and are also working on the development of a smart city. New challenges will arise and new value will be created. This guidebook is not intended to be a finished product, but rather a guidebook that will continue to evolve and be enhanced as new discoveries are made in each region.

We hope that you will find something helpful for your smart city initiatives.