

The Benefits of Comprehensive Data Use in Mobilizing Regional Projects: Improving Residents' Quality of Life by Leveraging Mobility

BRIEFING PAPER

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Introduction

In Japan, numerous projects have aimed to establish mobility as a service (MaaS).^{1,2} However, getting results has been challenging and only a limited number of cases have resulted in implementation. In rural areas, it is difficult to make mobility projects sustainable due to a declining and ageing population and the combination of residential dispersion, harsh topography and modest living standards.³

The World Economic Forum Centre for the Fourth Industrial Revolution Mobility team has been exploring the possibilities and approaches to revitalize local communities and improve residents' quality of life by implementing rural MaaS. In addition, it proposes a typology of rural MaaS and has identified key points.^{4,5}

In 2021, the project was launched to determine and verify the necessary conditions and elements for implementing MaaS.⁶ With the help of the inhabitants of Shobara City, Hiroshima Prefecture, the Regional Data Forum was established to "have lively discussions based on data, identifying problems and taking action in an agile manner." Under the lead of Yusuke Kanda of the National Institute of Technology (KOSEN) at Kure College,

the Centre for the Fourth Industrial Revolution, which had no experience in data analysis, decided to analyse the data. Once a month, the centre held discussions with local people based on the analysis and deepened the understanding of relevant issues and solutions in Shobara. It was a home-grown activity involving repeated trial and error.

One year of activities brought significant knowledge on what data is meaningful and important for the community, how to create a mechanism that enables data use and collaboration with local people, and the expected benefits and future issues related to data use.

A forthcoming playbook will bring together the approaches and important factors, covering how to address local problems by using data and how to revitalize communities using mobility as a lever.

For the purposes of this paper, "comprehensive data" is defined as data broadly about people's behaviour and the movement of goods. Such data is not limited to mobility; it includes data on consumer behaviour, medical care, health, leisure activities and other subjects and can be used and shared.



1

Background on the birth of the Shobara City Regional Data Forum

Despite an ageing population in the region, the penetration rate for the local e-currency card is extremely high, at 80-90%. The background is as follows.

- The government and the business community (Commerce and Industry Association) worked together to introduce the card.
- The region is geographically isolated and its economic zone is confined within the region. In this autarkic economy, the card is easily penetrable.

The card has achieved intra-regional circulation, with the Commerce and Industry Association

holding consumption and settlement data and reinvesting fee income. However, the data accumulated has yet to be fully used. In the meantime, there was a growing sense of urgency for the region's survival. The local population had a strong desire to solve problems they encountered daily, including transportation, and revitalize the local economy.

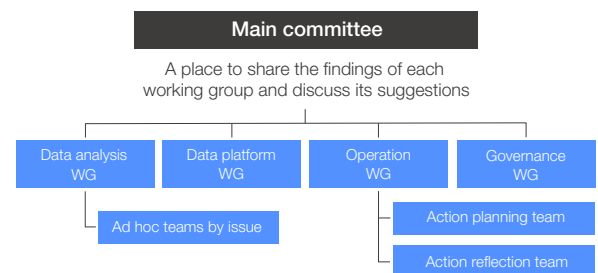
The Regional Data Forum was established to discuss effective measures to deal with local issues. The group uses and analyses data related to the behaviour and movement of residents, including consumption. By visualizing issues, actions and effects, the Regional Data Forum has devised several measures to revitalize the local economy.

FIGURE 1 The Regional Data Forum

Why focus on Shobara City?

- 1 A city facing challenges common to Asia**
...a declining and ageing population, decentralized residence
- 2 Existence of an urban structure**
...a microcosm of the city centre and suburbs
→ A global common denominator
- 3 Existence of data that can be used in the region**
→ Existence of consumption data
- 4 Strong sense of crisis and high willingness to take action to overcome challenges**
→ Low barriers to implementation and active cooperation from residents

Structure of the Regional Data Forum



Members: industry, government, academia and civil society (start-ups/automotive-related/central government/local government/local commerce and industry associations/transportation operators/academia, etc.)

Structure: flat organization (participation as individuals)/monthly meetings (frank discussions based on data analysis results)

Coordination: share information with prefectural projects/resident questionnaire and hearing based on Shobara City Public Transportation Plan

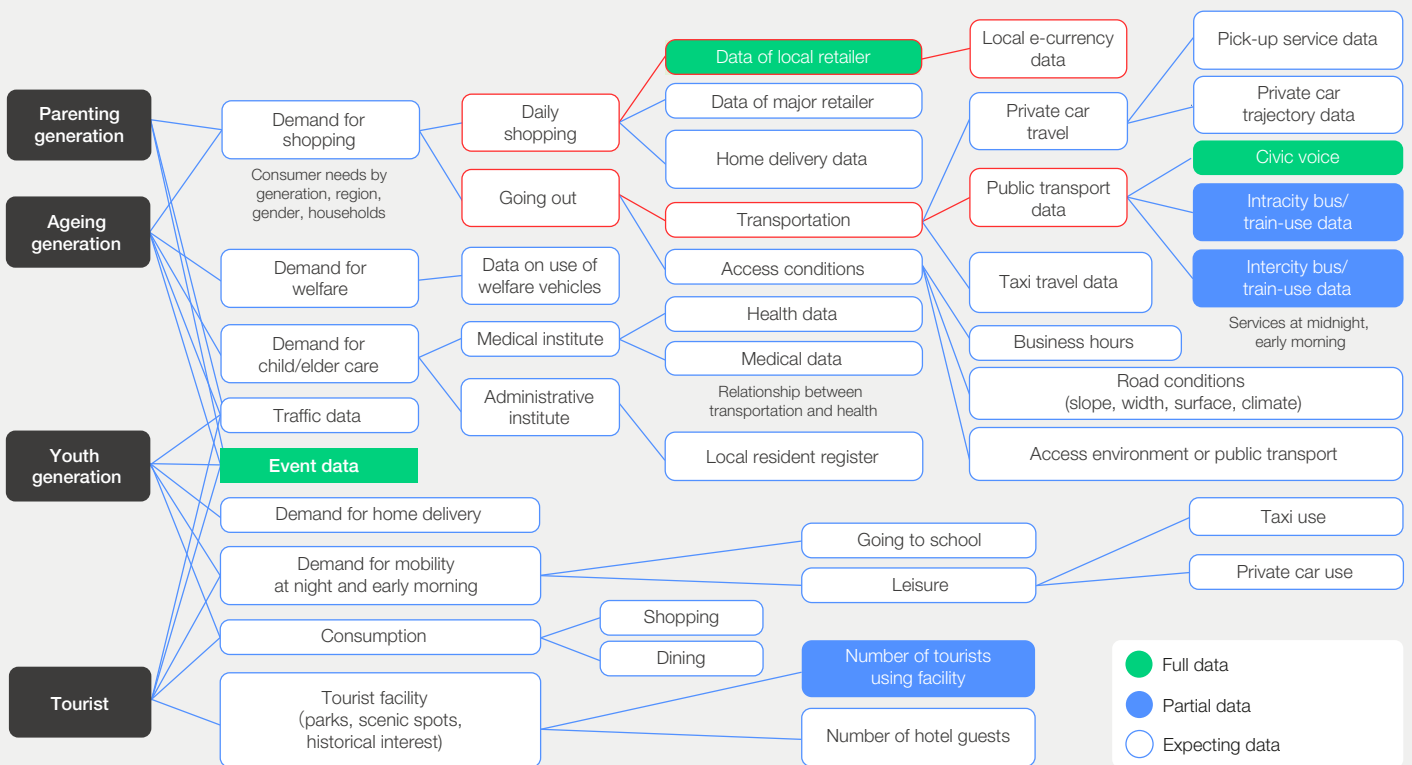
2

Why is comprehensive data important?

Data exists in various forms in the community. If one only looks at the data by itself, it is difficult to see its value and it is often dormant. People tend to be daunted by the prospect of data analysis, thinking that it requires specialized system knowledge and involves large cost burdens.⁷ However, it has recently become possible to take the first step in data analysis using business tools and intuitive methods without specialized knowledge.

In addition, to proceed with data analysis, it is necessary first to discuss the issues and consider what relevant data is available (see Figure 2). Particularly in the initial stages, it is necessary to be cautious about using data on personal mobility due to potential issues related to privacy protection. Yet, high-level discussions focused on mobility issues are possible even if only using other available data. It is clear that it is possible to visualise regional mobility issues by cross-analysing the data into a comprehensive dataset.

FIGURE 2 Relationship between readily-available data and what the Centre for the Fourth Industrial Revolution wants to know



Example of data cross-analysis

Based on the cross-analysis of public bus travel data and consumption data (red boxes above)
 Establishment of "places for rest and relaxation in the city"
 and creation of triggers for the policies to incite people to go out



Developed into a discussion of MaaS stations



The use of Shobara City's data in this case study, as shown in the two examples below, indicates that when discussions align with residents' gut feelings about local issues and individuals develop a sense of ownership, local enthusiasm increases and serves as a driving force to generate actions to revitalize and develop communities based on local ideas. In the future, the centre would like

to use people-flow data (spatial statistical data) to understand the behaviour in accordance with the social environment. By cross-analysing this with consumption data, it also aims to unveil the potential movement needs in the community and propose a means of transportation that meets those needs. It is hoped that these actions will contribute to further regional revitalization.

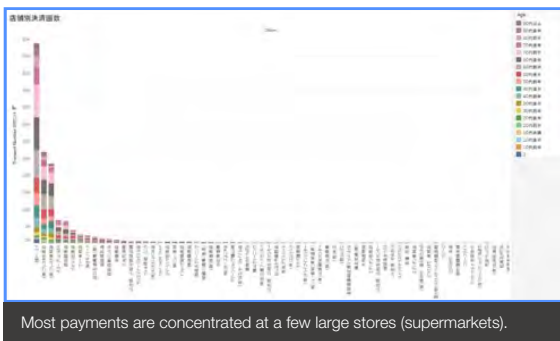
CASE 1

Changing the viewpoints of analysis – from supermarkets to a self-managing district

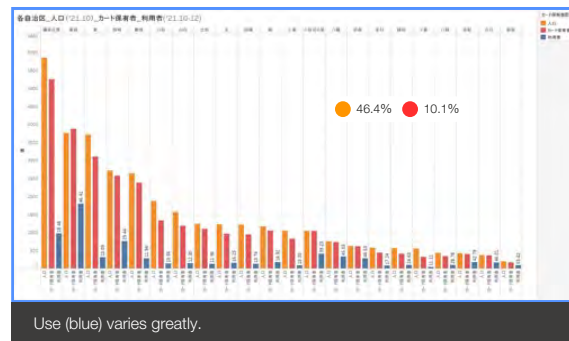
Case 1 is an example of using e-currency data developed by Shobara City to analyse regional issues. The centre created a discussion forum that aligns with the actual situation by digging into data on a self-managing district basis.

FIGURE 3 | From supermarkets to a self-managing district

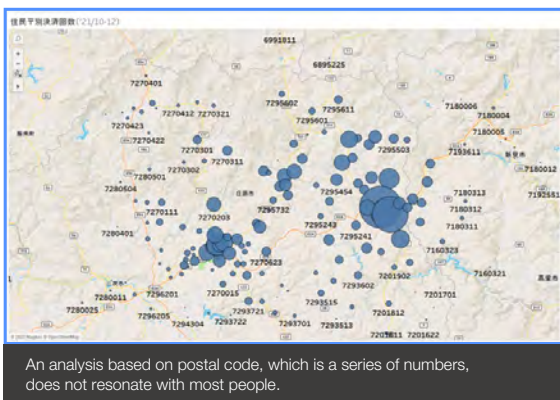
Number of payments by store



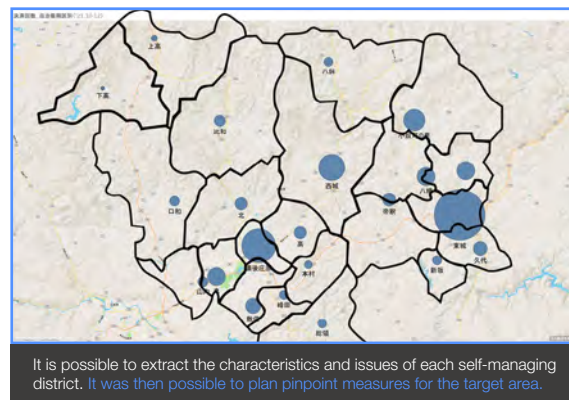
Use ratio by community association



Number of payments by postal code



Number of payments by community association



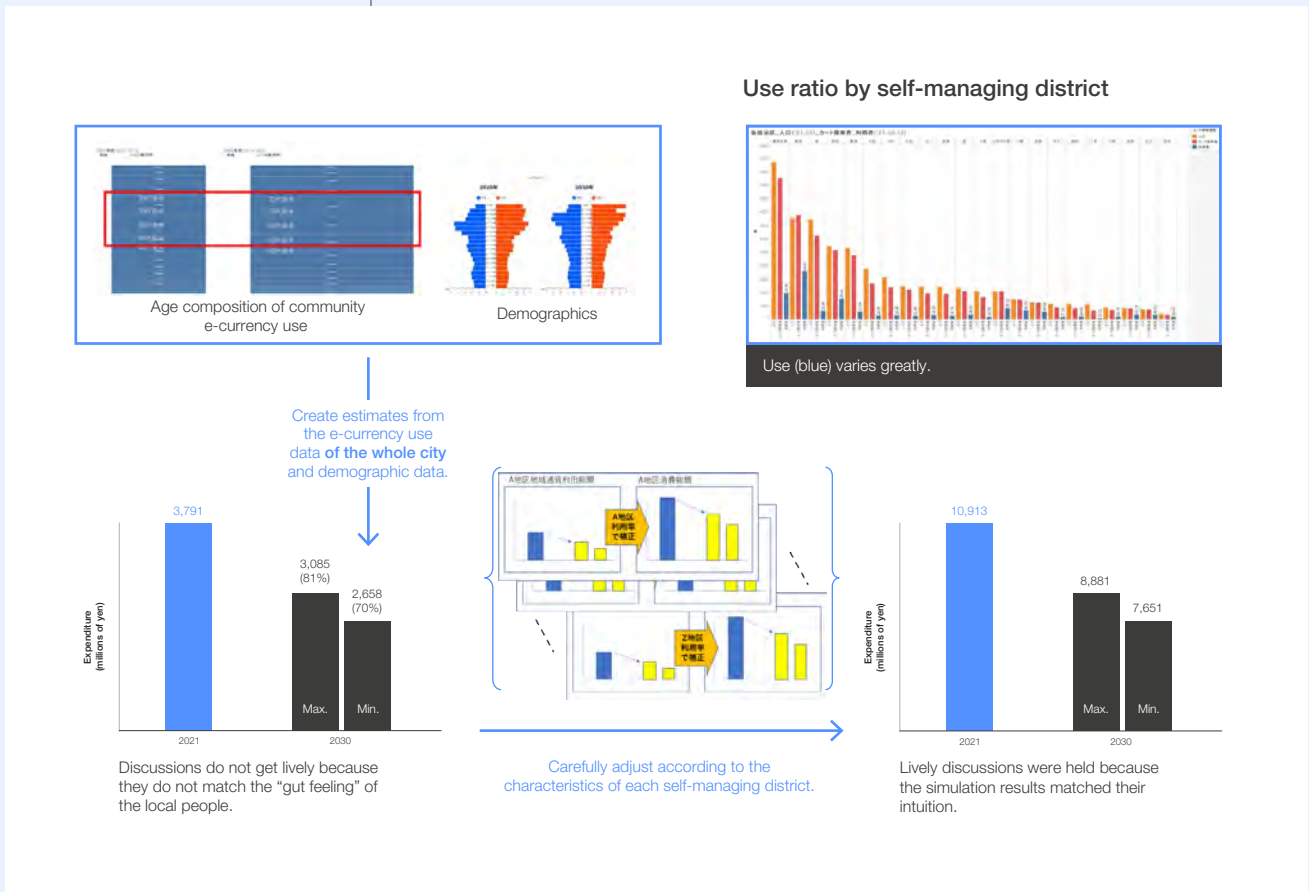
Change to intuitive analysis
In Shobara "by self-managing district"

CASE 2

Making 2030 simulations more intuitive and nurturing ownership

Case 2 is an example of promoting activities using cross-data analysis. Consumption and population data analysis helped in the development of a practical plan. It increased the level of enthusiasm in the discussions and generated energy to take action, even in a depopulated town, as it allowed stakeholders to share a more vivid sense of crisis.

FIGURE 4 | Intuitive simulations and nurturing ownership



3

Creating a mechanism to enable comprehensive data use

3.1 An open and flat organizational structure

To solve local issues through the use of comprehensive data, it is essential to involve people who are aware of the issues and enthusiastic about solving them. Solutions can be found by bringing together people with the same level of awareness and enthusiasm to discuss the issues and by freely sharing ideas without being bound by feasibility. In doing so, it is desirable to have an active local community. In every community, some people face problems or struggles in their daily lives. The first step in finding a solution is for people who want to solve problems to get together and exchange ideas.

The keywords in this process are the construction of “open” and “flat” organizations (see Figure 5).

- “Open” means that anyone with the enthusiasm to solve problems can participate, regardless of the organization they belong to (industry, government, academia or private sector), their region, or their age. Participation from a wide range of fields is desirable. For example, people outside the region can also participate and provide new information, ideas, and support. Moreover, participants from the government

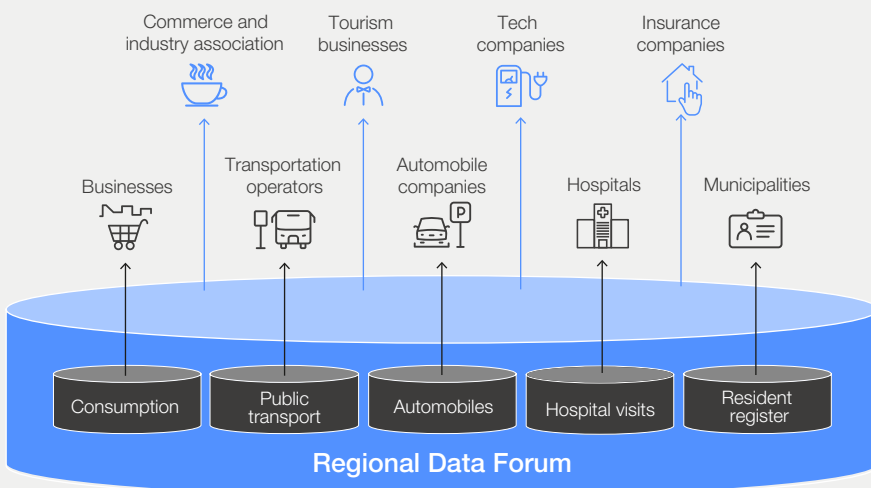
(municipalities) are essential. Free discussion will raise the level of enthusiasm and continuing to propagate it will push the local government and other organizations into action.

- “Flat” means two things:

A “flat organization” means that the organization itself is not limited in its positioning or rationale and is not bound by any existing organizations set up by the government. It should be able to move freely and flexibly on its own.

A “flat structure” within the organization refers to creating an environment where participants can freely express their thoughts and feelings. When people with a high level of awareness of mobility issues gather together, the members may be the same as the government’s existing MaaS council. However, even in this case, if each person participates as an individual with a high awareness of the issues instead of as a representative of an organization, for instance, it encourages free and frank discussions.

FIGURE 5 Building an open and flat organization



The keywords for a desirable organizational body are “open” and “flat”

Open: anyone with enthusiasm, from diverse fields in industry, government, academia and the private sector, can participate.

Flat: An organization that can move flexibly and create an environment where people can discuss freely and frankly.

3.2 A sustainably developable management approach

Building trust is essential in sharing and using comprehensive data among participating members. First, members with a shared awareness of issues gather and begin activities as a trial run to foster trust gradually. That trust should be deepened through the collaborative implementation of actions such as demonstration and implementation activities.

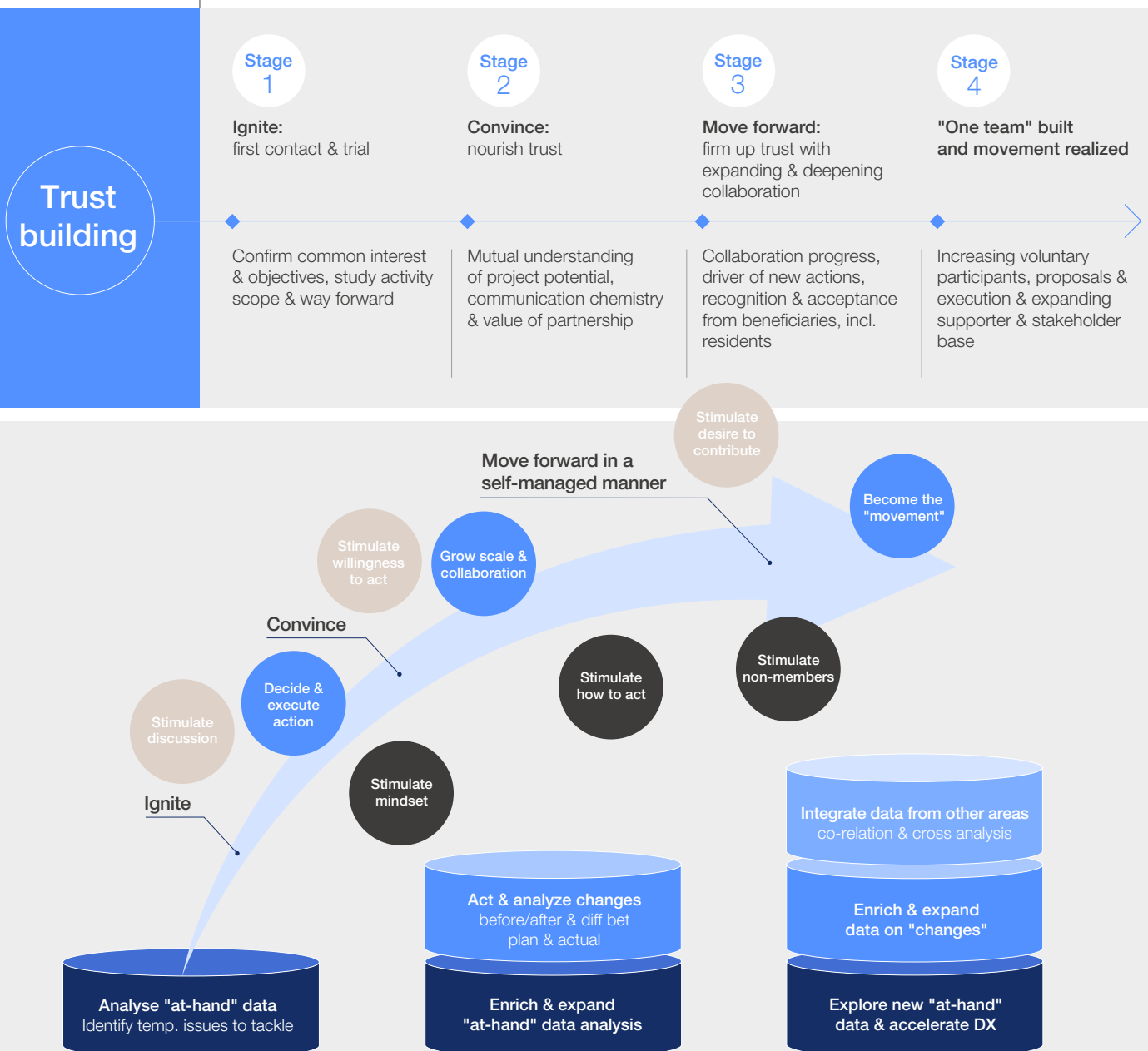
In the initial phase of trust, discussions are spontaneously and freely conducted in an open and flat organizational structure. However, as the trust deepens, there will be an increasing number of issues to deal with. In this situation, the organizational structure should allow the members to consciously and continuously provide the core issues and visions of the activity. In doing so, it is vital to have members with leadership⁸ and coordinating functions⁹ to accelerate the effort. Several participating

members can consciously take on these roles. They will be at the centre of further discussions.

In addition, it is desirable to conclude a non-disclosure agreement (NDA) in the initial stage and check compliance status as needed so that data providers and users can be assured about holding discussions. If trust is established from the initial stage, it may be possible to proceed with flexible and in-depth discussions concurrently with the conclusion of the NDA. Furthermore, the level of trust must be such that feedback can be provided as needed and the trust can be rebuilt.¹⁰

The ideal state to aim for is for the deepening of trust among participating members to unify the community and become a movement, triggering voluntary participation and the proposal and implementation of actions from a wide range of people¹¹ (see Figure 6).

FIGURE 6 Development scenario enabling trust building and data use



4

Future prospects

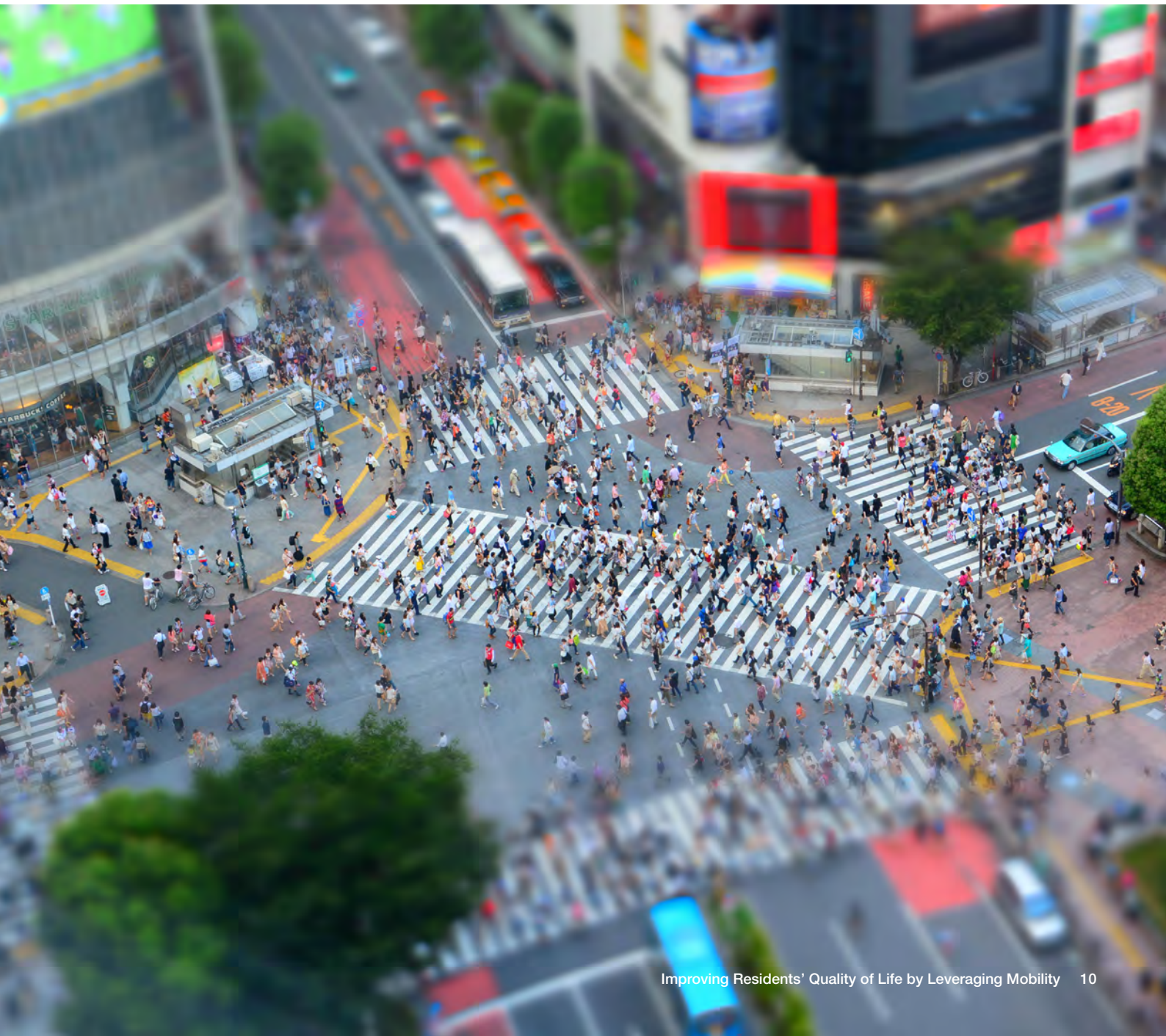
The future outlook for activities is to use more diverse data and to improve both the quality and quantity of actions. To this end, it is essential to implement an agile and highly effective plan-do-check-act (PDCA) cycle.

In addition, it is essential to have a third-party organization for organizational management to enable:¹²

1. Industry, government, academia and the private sector to provide data and tools for mutual use.¹³
2. A system that is not limited to “mobility/ transportation” and can collaborate and cooperate with a variety of fields.

3. The flexibility needed to use external resources to fill the gaps.

Using the activities above as leverage, the project plans to study and implement the construction of a mutual aid network and the use of hubs, which involves non-transportation businesses and residents. It will be a crucial part of the comprehensive measure to incentivize people to go out and increase their mobility.



Endnotes

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5. World Economic Forum, “MaaSを用いた 地方モビリティの変革[Transforming Rural Mobility using MaaS]”, April 2021, https://www3.weforum.org/docs/WEF_MaaS_Rural_Mobility_JPN_2021.pdf.
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7. Salesforce, “データウェアハウスとは?分析用に整理された情報の倉庫について解説[What is a data warehouse? Explanation of a warehouse of information organized for analysis]”, <https://www.tableau.com/ja-jp/learn/articles/what-is-Data-Warehouse#what-is-data-warehouse>.
8. The leadership provides direction for activities while driving field activities, from demonstration to implementation.
9. A coordinator supports short- and mid-term planning and deployment and secures and coordinates human, material, financial and technological resources in accordance with the actual situation in the field in order to ensure the creation of the activities.
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12. Secretariat of the Shizuoka MaaS Core Business Demonstration Project, “Shizuoka MaaS”, <https://s-maas.jp/>.
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