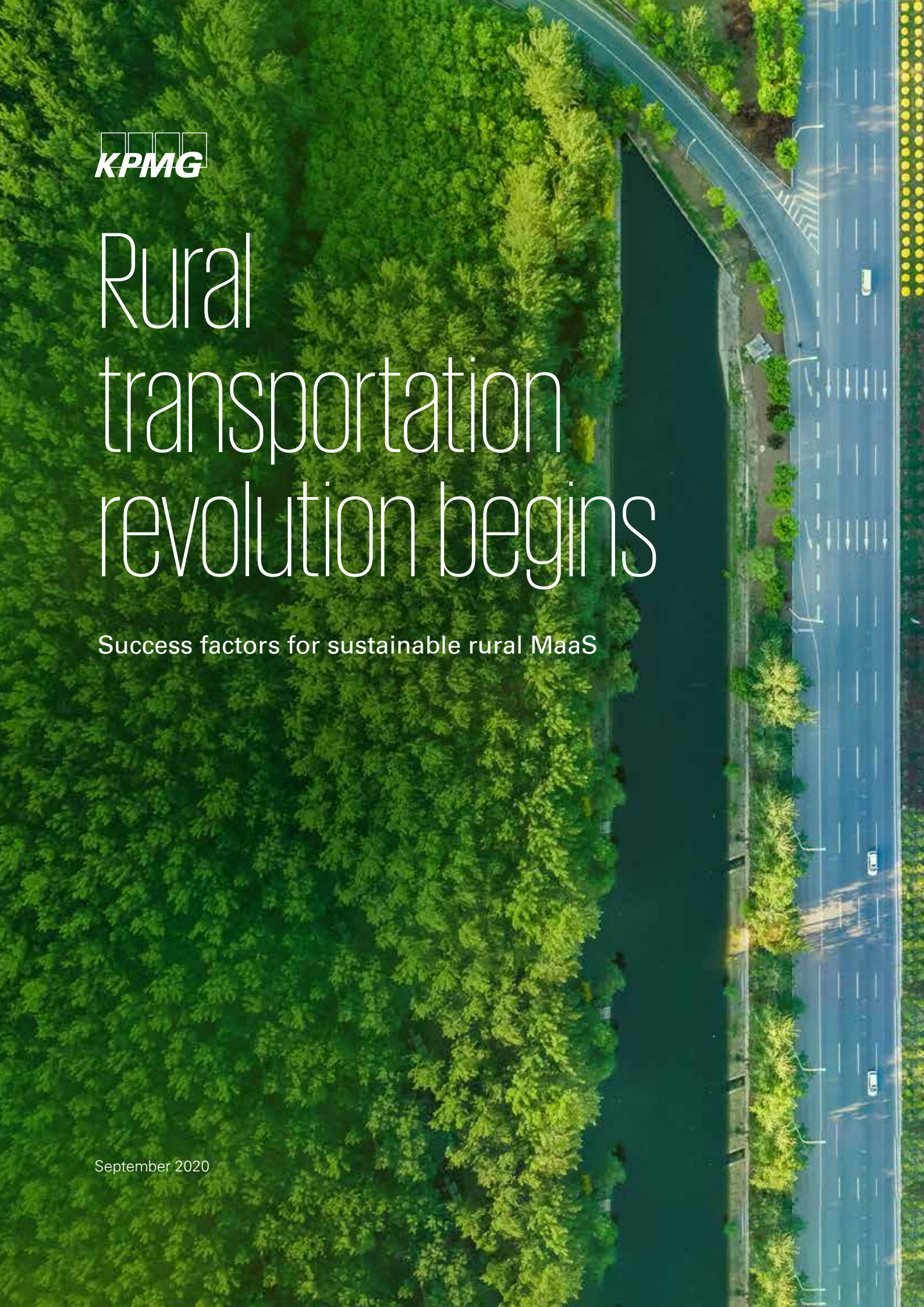


KPMG

Rural transportation revolution begins

Success factors for sustainable rural MaaS

September 2020

Contents

Introduction

Transportation Revolution Holds the Key to Regional Revitalization

Driven by accelerating national and corporate efforts, the concept of Mobility as a Service (MaaS) is deeply penetrating into Japan, with some concerned parties eagerly advocating it. I have been working to promote MaaS over the last few years and thus welcome this trend, but I am also slightly concerned about it.

There seem to be some misunderstandings and wrong impressions about MaaS, as though, for example, MaaS apps or data coordination will solve all rural transportation problems. There is also another misunderstanding that the development and provision of MaaS apps are indispensable for providing modern mobility services.

I would like to welcome KPMG Mobility Research Japan's publication of a report on rural MaaS at a very appropriate timing. Taking this opportunity, I expect the government, local authorities, and service providers to carefully re-consider what type of mobility service should be provided to solve transportation challenges in rural areas, and what kind of role each organization can play.

I have been involved in MaaS pilot projects carried out by both the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and the Ministry of Economy, Trade and Industry (METI). Personally, there were two takeaways from these projects.

Firstly, it became clear that many organizations are eager to solve rural transportation challenges with new mobility services, and that many activities were collaborative efforts by transportation operators, municipalities, and service platformers. I became aware of this fact because the two ministries received more proposals from many regions than originally expected.

Secondly, the rise of MaaS became a driver for both METI and MLIT to work together to combine hardware and services. Before the rise of MaaS, METI and MLIT had been implementing policies separately, with METI being the supervisory authority for hardware companies including those in the automobile industry, and MLIT for mobility services. The two ministries have taken an unprecedented major step, working together to invite and implement proposals for demonstration projects and to control councils.

Currently, the reports of the projects implemented in various areas in the first fiscal year (2019) are being submitted. We should not let them end as temporary efforts, but rather create an environment where they will be carried out as practical services on a continuous basis, yielding positive results.

MaaS, particularly rural MaaS, matters because it is essential to people's happiness and the survival and growth of local communities. Many local communities have been facing the harsh reality that they cannot maintain their public transportation systems due to excessive penetration of motorization. If the situation does not improve, communities themselves may not survive. To radically solve the problem, creating MaaS apps alone is not enough. We need to make more fundamental changes.

It is understandable that we need to encourage elderly people to voluntarily return their driver's licenses in order to prevent possible traffic accidents caused by them. However, we also need to take proper measures for associated negative impacts: not being able to go out on their own can impair the quality of their lives, and shutting themselves up in their houses for a long period of time can affect healthy life expectancy, and thus increase the anxiety and burdens of their families.

For this purpose, it is necessary for a wide range of stakeholders to cooperate with one another, inviting local residents to join, as well as contributing to the community as one in an integrated manner.

KPMG is a global firm with branches across the world. With regard to mobility business, it is actively working in various locations, including the United States, Europe, and Asia. I would like KPMG, by utilizing its global network as well as its internal and external networks, to engage in project management within which the future vision of each reginal community is fully projected. I would be pleased to take part in these efforts as an advisor to KPMG.

Haruo Ishida

Advisor of KPMG Mobility Research Japan/
Professor emeritus, University of Tsukuba/
Director of Research Institute for Road and Street

Description

What is Rural MaaS ?

MaaS was born in Finland

Mobility as a Service (MaaS) is a concept of a new mobility service proposed in Finland. Following the worldwide spread of smartphones in the mid-2010s, various app-based mobility services such as ride sharing, car sharing, bike sharing, e-scooter sharing, taxi apps, and train apps, started to become widely available, triggering significant innovation in the transportation industry. Meanwhile, there was an inconvenient disadvantage for users traveling with multiple services of using different apps for each mode of transportation. This was because most mobility services were provided by different companies. The concept of MaaS (i.e., offering mobility as a single service) was born of attempts to offer an integrated mobility service, such as a package tour, by including multiple mobility services together in a single application.

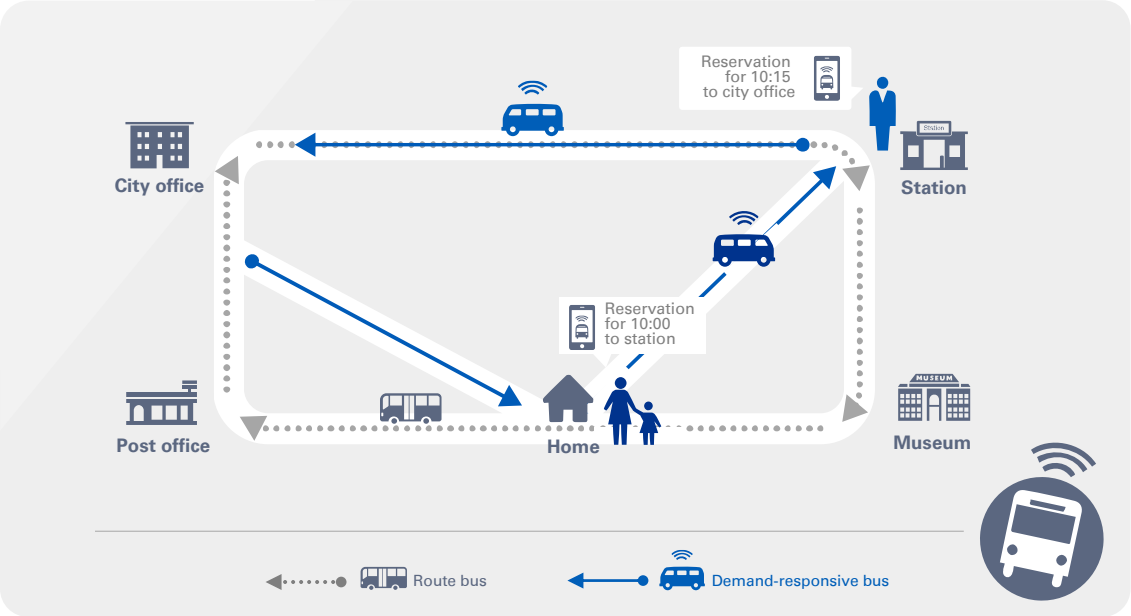
Today, the word "MaaS" is not only used for integrated mobility services originated from Finland, but also for mobility services provided by autonomous cars and demand-responsive transportation. Therefore, the general meaning of "MaaS" is almost equal to "new mobility service."

What is rural MaaS?

"Rural MaaS" is used for new mobility services provided in rural areas. Automobile dependency (motorization) and population decline are accelerating in rural areas and some suburbs in Japan, with more local trains and buses being discontinued or reduced in number.

Many of the areas are also graying further, with more elderly people unable to travel using their own vehicles after voluntarily returning their driver's licenses. The shrinkage of public transportation has also been a serious problem for young people without a driver's license, such as high school and junior high school students. The more inconvenient transportation in a rural area or suburb becomes, the more the population declines, which could even cause the demise of the community. This is where rural MaaS comes in. Rural MaaS attempts to retain minimum transportation services while reducing costs by introducing advanced technology and services.

In Finland, which is also leading the way in rural MaaS, a new type of service is already available. For example, a taxi sharing app was introduced to share the space of patients going to the hospital with general passengers. In Finland, health insurance covers most of the taxi transportation costs for patients, so if vacant seats of taxis can be shared with other passengers, the cost of transportation can be significantly reduced. Kyyti, a startup, is the top rural MaaS service provider in the country. On the other hand, in Japan, demand-responsive rural MaaS services have already been launched. In Toyoake City in Aichi Prefecture, Choisoko service is provided by Aisin Seiki Co., Ltd. and Sugi Holdings Co., Ltd. Mobile phone carrier, NTT DOCOMO, INC. provides AI Bus® services in many parts of Japan as pilot projects. The Ministry of Land, Infrastructure, Transport and Tourism (MLIT) and the Ministry of Economy, Trade and Industry (METI) launched MaaS demonstration tests in 2019, with numerous selected projects providing experimental rural MaaS services.



Demand-responsive shared bus (concept)

Types of rural MaaS

Several types of rural MaaS have already been introduced in Japan. These services can be classified into the following six types:

1. Demand-responsive share ride
2. Taxi sharing
3. Flat-rate taxi
4. Private vehicle ride hailing services (private fee-based passenger transport)
5. Autonomous shuttle/taxi
6. Green slow mobility (low-speed electric shuttle)

In this report, we will describe the main features of these six service types, providing typical examples. However, it should be noted that in the future, services that do not fall under any of the six types may become available.

1 Demand-responsive share ride

Demand-responsive share ride is a kind of shared shuttle service which operates flexibly according to user demand. While fixed-route buses operate according to their fixed schedules, routes, and bus stops, demand-responsive share ride can flexibly change its schedule, route, and stops.

MLIT classifies demand-responsive share ride (or MLIT's term "Demand-responsive Transport") into multiple types: (1) fixed schedule/flexible schedule, (2) fixed-route/flexible route, and (3) bus stop/door-to-door. There are thus seven patterns theoretically, apart from the traditional fixed-route bus service.

One of the leading providers of demand-responsive shared ride is Via, an Israeli-founded startup that operates mainly in North America. Via operates its service, using "virtual bus stops" that appear only on a map app, freely picking a route with more potential passengers. When a passenger sends a request with their desired pickup and drop-off points and time, Via selects and sends the driver the best route and schedule, taking multiple passengers' requests into account, while guiding the passenger to a certain virtual bus stop at a certain time through the app. With flexible routes, fares, and schedules, the service is capable of flexibly meeting changing demand, drastically reducing operating costs.

In Japan, typical examples of demand-responsive share ride (including demonstration services) are: MONET Technologies, a joint venture launched by Toyota Motor Corporation and SoftBank Corp.; AI Bus™ of NTT DOCOMO; KNOWROUTE of Nishi-Nippon Railroad Co., Ltd. and Mitsubishi Corporation (provided in Fukuoka City);
SAVS of Mirai Share Co., Ltd., a venture company from Future University Hakodate; and Choisoko of Aisin Seiki and Sugi Holdings, which is described later.

According to the Handbook of Demand-responsive Transport (March 2013) by the MLIT Chubu District Transport Bureau, for demand-responsive share ride (demand-responsive transport) to function appropriately, a clear division of roles and mutual complementary relationships must be established between the shared ride service and other transportation services, such as fixed-route buses, community buses, taxis, and welfare transportation services. It also states that, to introduce the service, it is necessary to segregate the territory and market from those of existing fixed-route buses and taxi business through negotiation among parties concerned in advance. In other words, demand-responsive transport should not operate on existing bus routes or deprive taxi business operators of business opportunities.

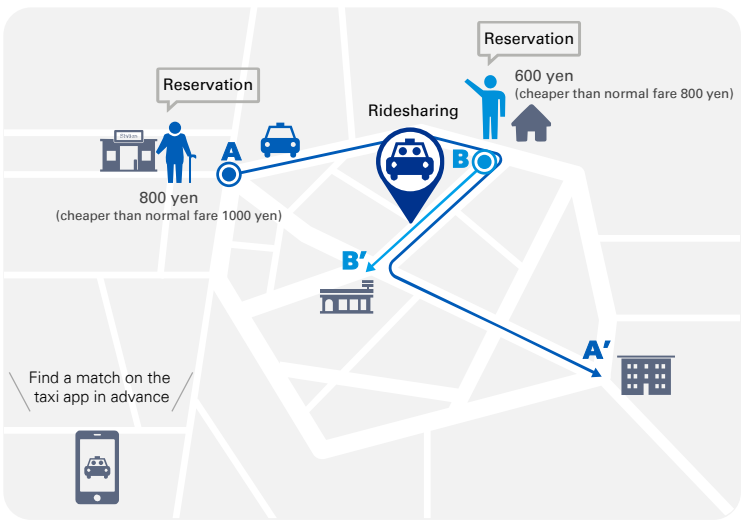
The Road Transportation Act recommends that a "Local Public Transportation Council" be established as a platform for the local government to adjust the interests of the demand-responsive transport and other transportation services. Any business operator who wants to introduce demand-responsive transport must submit its business plan to the Local Public Transportation Council for deliberation and obtain approval before launching the service.

❷ Taxi sharing

Taxi sharing is a service that allows people to share a taxi, which usually operates on the premise that it transports one group of passengers to one destination.

The service allows passengers to use an app to find someone who takes a taxi to travel in the same direction in the same time, even if they take it from a different origin to a different destination, so that they can use a taxi at a lower price than when they use it alone (or as one group), by sharing the fare according to the distance they travel.

Concerning taxi sharing, MLIT and two taxi companies conducted demonstration tests in Tokyo in January to March 2018, and five companies conducted demonstration tests in Sapporo in October to November 2019. In the demonstration tests in Tokyo, about 90 percent of passengers who sought ridesharing were unable to find a match and ended up not using the service, which clearly showed the necessity of raising the matching rate by some means. The service has thus not been put into practice.



Taxi sharing (concept)

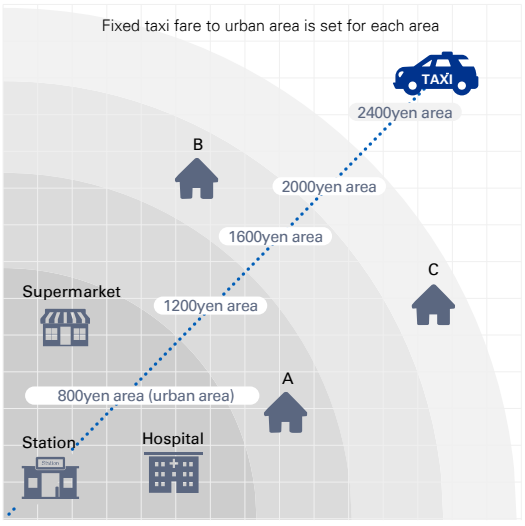
❸ Flat-rate taxi

Flat-rate taxis are a service that allows people to use taxis at a fixed rate so that they can use them without worrying about being charged more than expected. There are two types of flat-rate taxis: fixed-rate type, which sets a fixed rate for certain pairs of origin and destination, and monthly-rate with unlimited-ride type, which offers unlimited use within a certain area or frequency of use.

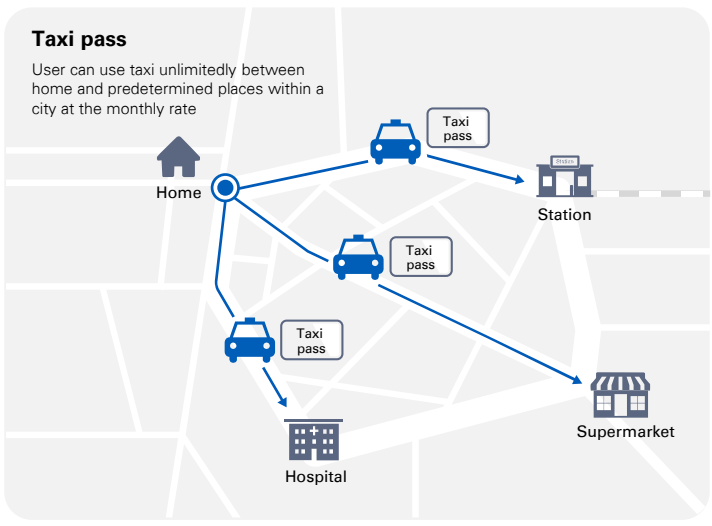
A good example of fixed-rate taxis is fixed-rate airport taxis. In Tokyo, multiple taxi companies offer fixed-rate services from Haneda Airport to certain places within the Tokyo metropolitan area. Similar services are available in other areas, as well. Fixed-rate taxi services for elderly people without personal cars were implemented as MLIT's demonstration tests in Hokkaido, Fukushima, Tokyo, Kanagawa, Okayama, and Fukuoka from October through December 2018.

Minataku is an actual service that has been in operation in Minamisoma City, Fukushima, since March 2018. The service is available to any residents living in target areas, which include residents without a driver's license or who have difficulties using public transportation. The rate is fixed for routes between homes and predetermined places within the city.

JTBジェロンタクシー® (JTB Geron Taxi) of JTB Corporation is a typical example of monthly unlimited-ride taxis. This service is available to elderly people aged 70 and older only, allowing them to use a taxi seven days a month with a pass to travel between their home and two places they have selected in advance (store, a local station, or primary doctor). Following demonstration tests conducted in Kitakyushu City, Fukuoka, in 2015, and Suwa City, Nagano, in 2018, the service was launched in Meiwa Town, Gunma, in 2018. Because the service is offered as tours organized by a tourism agency, the service period is limited and if users wish to continue, they have to apply for the next period.



Fixed-rate taxi (concept)



Monthly unlimited-ride taxi (concept)

❹ Private vehicle ride hailing services

(private fee-based passenger transport)

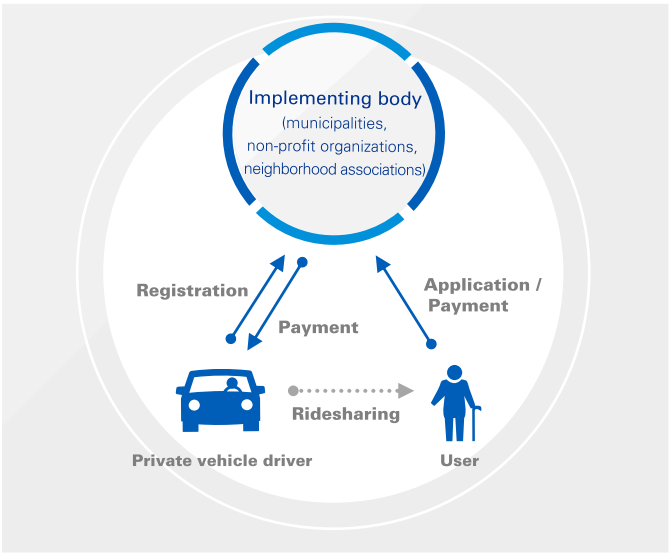
Private vehicle ride hailing is a service officially called "private fee-based passenger transport."
It is a paid transportation service provided in areas not fully covered by existing bus/taxi companies' transportation services. Personal cars are used for ride sharing, but organizations such as municipalities, nonprofit organizations, and neighborhood associations must act as an implementing body.

Although the service is authorized to transport people for a fee just like ridesharing in other countries, service providers must satisfy a number of requirements to offer it. The requirements include: (1) The service can be provided only in areas that lack public transportation, (2) The service provider must obtain consent from concerned parties in the area before launching the service, (3) Routes and areas must be specified in advance, (4) The service can only be provided for residents in the area, and (5) The service fee must be about half of that of taxis. A typical example of private vehicle ride hailing is "Sasaeai Kotsu" (mutual support transportation) provided by a non-profit organization in Tangocho, Kyoto. In Sasaeai Kotsu, volunteer drivers provide a service similar to ridesharing, using their private cars and an app provided by an American company, Uber. It must be noted, however, that private fee-based passenger transport is not limited to ride hailing, but also includes demand-responsive share ride, where municipalities provide vehicles (buses and vans) and outsource the operation to non-profit organizations or business operators.

< Regulations on onerous passenger transportation with private vehicles >

(transportation service in areas without public transportation)

Service areas	Areas where services cannot be easily provided by bus/taxi business operators
Organizations that can provide service	Municipalities, non-profit organizations, etc
Conditions to enter the market	Consent of concerned parties in the area (to be obtained at Local Public Transportation Council or management council in advance)
Transportation type	Fixed-route or fixed area transportation
Users	Municipal residents or local residents
Private vehicles that can be used	Private vehicles licensed by the implementing body
License requirements	Class 1 driving license + attendance at designated courses
Fare setting	Less than actual costs (about 1/2 of taxi fare) *Consent must be obtained from concerned parties in the area



Private vehicle ride hailing services (onerous passenger transportation with private vehicles) (concept)

❺ Autonomous shuttle/taxi

Autonomous shuttles and taxis are a service where self-driving shuttles and taxis operate in a certain area. Typical examples from other countries include Waymo One, an autonomous taxi service that has been provided in Phoenix Arizona since December 2019 by Waymo, a subsidiary of Alphabet Inc., the parent company of Google. Autonomous shuttle services are provided across the world by French startups, such as NAVYA and EasyMile. In Japan, autonomous shuttles and taxis are in operation temporarily as a part of autonomous driving demonstration tests conducted by the Cabinet Office, MLIT, METI, or Tokyo Prefecture. There is no actual service provided by operators yet.

The launch of the first autonomous shuttle service (free of charge) is planned in Sakai Town, Ibaraki, in the fall of 2020 with the cooperation of BOLDLY Inc. (formerly SB Drive), a subsidiary of Softbank, and MACNICA, Inc. However, autonomous driving has a number of technical, system, and cost-related issues and there is still a long way to go before it is established as an actual, useful transportation service in a community.

❻ Green Slow Mobility (low-speed electric shuttle)

Green Slow Mobility means electric shuttles with a capacity of 4 or more that run on public roads at 20 km/h or below. It is low-carbon, local mobility promoted by MLIT and the Ministry of the Environment (MOE). Currently, service operators of Green Slow Mobility will be granted a subsidy by MOE.
Two types of vehicles, electric golf carts with a capacity of 4 to 7, and low-speed electric buses with a capacity of 10 to 16 can be used for the service and they are expected to be used as a shared shuttle service, private fee-based passenger transport, or paid transportation services provided by volunteer organizations (with a fee equivalent to actual costs). In ongoing demonstration tests, they are being utilized as city sightseeing buses, local transportation for elderly people, sightseeing mobility, mobility for events, etc.

While Green Slow Mobility does not require high-standard safety equipment as the vehicles run slowly, its negative impact on existing traffic flow needs to be minimized and it is not suitable for long-distance travel. Therefore, it has the disadvantage that its introduction is limited to certain areas with less risk of traffic impact.

① Golf cart type

4 to 7 passengers

②Electric, low speed type

10 passengers

16 passengers

Green slow mobility

(Source: Key Points for Introducing Green Slow Mobility, MLIT, June 22, 2018)

Case Study

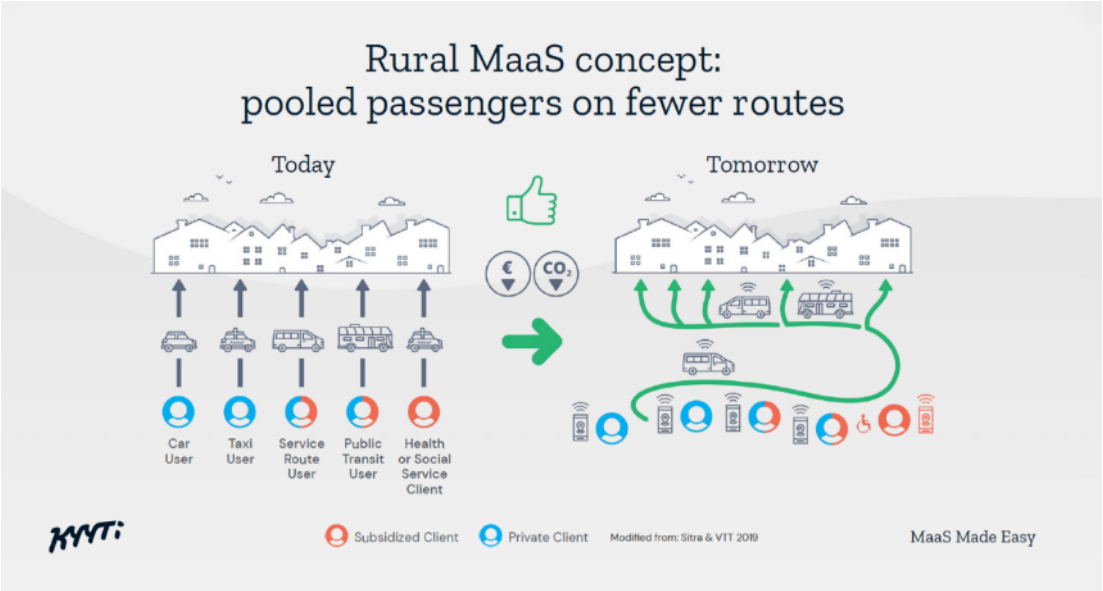
Learning from Successful Cases of Rural MaaS

Following the domestic MaaS boom, an increasing number of companies are interested in MaaS or considering entering into the market. Government sections in charge of MaaS and MaaS experts are receiving many inquiries from various enterprises as to how to approach MaaS, as managers of those enterprises have been ordered by their top management to consider building a MaaS-related business model.
As compared with MaaS in cities, entering rural MaaS markets is not easy because 1) profitability of rural MaaS cannot be guaranteed without government subsidies and 2) negotiation with existing transportation operators and local municipalities for new entry is unavoidable. Therefore, in this section we will look at two successful cases of rural MaaS and describe how both companies were able to enter the rural MaaS market. One is the case of Kyyti, a startup from Finland, a leading MaaS country, which provides rural MaaS services in Finland. Another is the case of Choisoko, a demand-responsive share ride service jointly provided by the new business department of an auto parts manufacturer and a leading drugstore chain.

Learning from the Success Case of rural MaaS in Finland, a leading MaaS country

In Finland, the government has been taking the initiative to establish a MaaS friendly ecosystem to promote MaaS at the state level. In a bold regulatory reform implemented in 2018, the government obligated transportation business operators to establish an open access system connected to their data systems so that MaaS business operators can provide integrated services that combine different transportation services, or MaaS. This government initiative has led to the emergence of MaaS Global, a startup established in 2015 to become a leading MaaS company operating across the world including the Japanese market.

In contrast to MaaS Global operating mostly in cities, Kyyti is a Finnish MaaS startup providing MaaS services mainly in rural areas. Kyyti is a platform service provider offering various MaaS services, such as corporate MaaS and university MaaS. However, in this section we will focus on its rural MaaS service as a successful case not only because of its unique service model, but also because the ecosystem enabling the model is interesting to look at.



Kyyti's Concept of rural MaaS to change the purpose of vehicles from single-use to multiple-use (source: Kyyti)

Taxi rides in rural areas of Finland are usually covered by subsidies

According to Kyyti, thinly populated rural areas in Finland do not have accessibility to public transportation such as busses. Therefore, necessary transportation expenses to go to hospitals, schools, and nursing facilities are basically covered by national or municipal subsidies. For example, when a resident needs to go to hospital, they can call a local taxi but only needs to pay 4 to 5 euros (500 to 600 yen at the exchange rate of May 2020) and the rest is covered by the government or municipality through their health insurance.

Kyyti saw an opportunity in the vacant seats of taxis covered by subsidies

Kyyti noticed that most taxis covered by subsidies only carry single passengers and that vacant seats are not utilized. The company came up with a new service to share a taxi of a passenger supported by subsidies with other passengers traveling in the same direction at the same time. This service can significantly reduce the fare of additional passengers while making efficient use of the limited number of taxis in a rural area. Kyyti uses different vehicles with capacities from 3 to 15 depending on the area and purpose, delicately managing conditions for ridesharing. For instance, Kyyti manages the capability to carry wheelchairs on a vehicle or prohibiting ridesharing when a seriously ill patient is being carried.

Profit from ridesharing currently goes to private business operators

Additional sales and profit yielded from selling vacant seats of subsidized taxi rides are distributed by service contracts with municipalities. Currently, in most cases, such profit seems to go to taxi companies and Kyyti, however, there is a possibility that this practice will be reconsidered in future contracts. Kyyti claims that even if contracts are reconsidered, its revenue and share will be guaranteed by the government and municipalities.

A certain level of government subsidies is necessary to provide rural MaaS in low-traffic-density areas

In low-traffic-density areas, the profitability of public transportation services is low and therefore, a minimum level of transportation cannot be guaranteed without a certain level of public support. For this reason, Kyyti stresses that public support must be guaranteed for the provision of rural MaaS and that service operators must be allowed to improve their services for higher revenues and profit.

In Finland and most Western countries, public transportation services are provided by public bodies and in most cases their operating costs are subsidized by the state or municipality. On the contrary, in Japan, most public transportation services are provided by private companies. Therefore, when looking at the Finnish example, we must take this difference into account. Besides, the Finnish system in which taxi fares for hospital travel are covered by health insurance cannot simply be introduced into Japan, because the Japanese health insurance system does not cover hospital travel costs.

Nevertheless, the Finnish approach to rural MaaS is a great example of collaboration between public and private sectors where the role of each sector is clarified and ideas from the private sector are utilized. This example should be used as a reference when we consider the Japanese rural MaaS framework. Furthermore, as shown in the figure above, Kyyti is working to realize an ideal rural MaaS model by using service vehicles for multiple purposes, such as hospital visits, commuting, nursing, or pickup and drop-off. This is because in rural areas, the number of professional drivers and service vehicles is very limited. This concept is worthy of consideration in rural areas and suburbs in Japan.

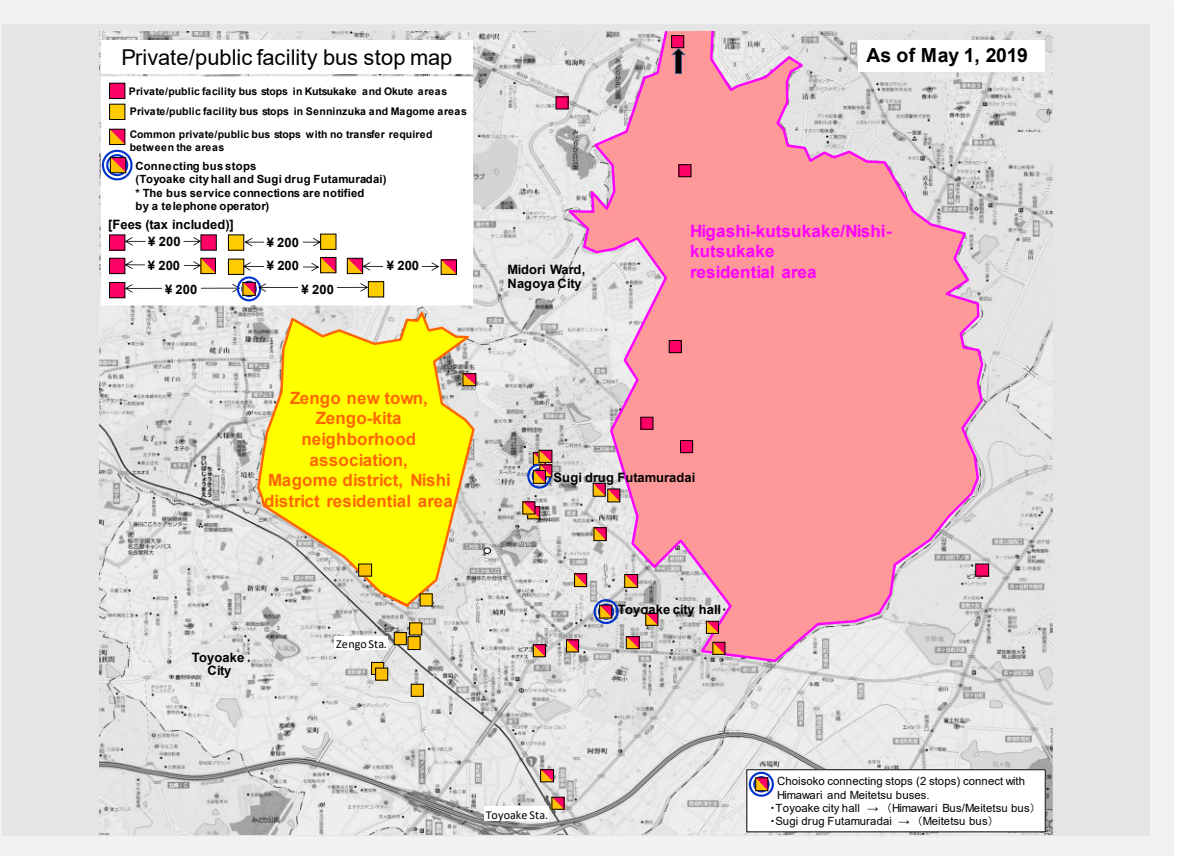
Learning from the Success Case of rural MaaS
Success factors of a Japanese company

Demand-responsive share ride service "Choisoko" is a demand responsive transport service launched in Toyoake City, Aichi in July 2018 by Aisin Seiki, a major auto parts manufacturer of Toyota, and Sugi Holdings, a leading drugstore chain.

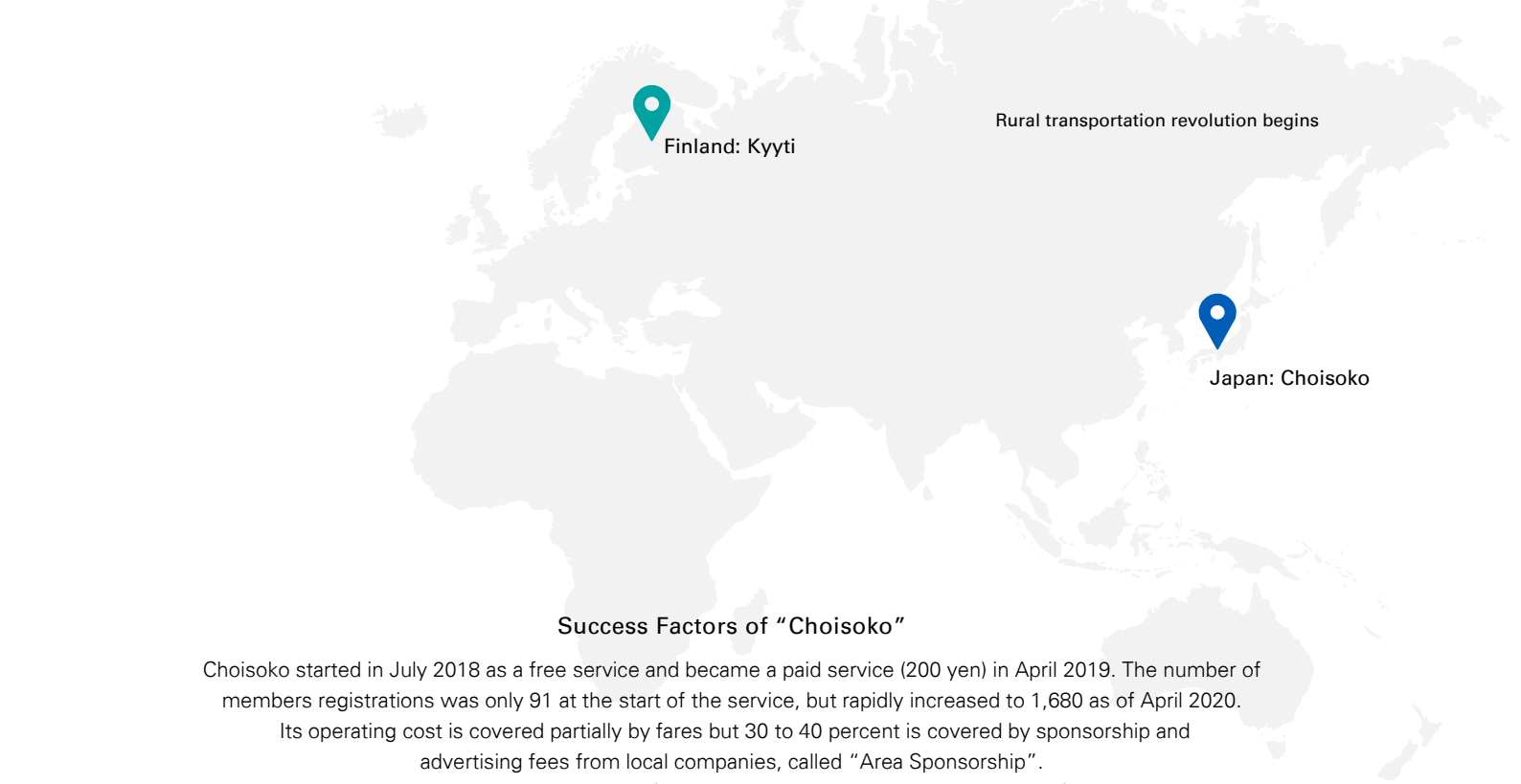
Service Description of “Choisoko”

- Service is provided in two areas within Toyoake City(1) Kutsukake and (2) Senninzuka & Magome. Bus stops are located at 200-meter intervals on average.
- Service is open to all residents living in the two areas, however, only residents aged 65 or older can use all bus stops in the areas. Other residents are allowed to use limited bus stops.
- An eight-passenger van is allocated to each area. The service is provided from 9 a.m. to 4 p.m. only on weekdays.
- The fare is 200 yen.
- Member registration is required to use the service. The service can be reserved by phone, smartphone app, or email (Up to now, all reservations have been made by phone).

(Source: Aisin Seiki Co., Ltd.)



Two areas in Toyoake City covered by the Choisoko service (Source: Aisin Seiki Co., Ltd.)



Success Factors of "Choisoko"

Choisoko started in July 2018 as a free service and became a paid service (200 yen) in April 2019. The number of members registrations was only 91 at the start of the service, but rapidly increased to 1,680 as of April 2020. Its operating cost is covered partially by fares but 30 to 40 percent is covered by sponsorship and advertising fees from local companies, called "Area Sponsorship".
As a result, municipal subsidies have been successfully reduced to approximately 60 percent of the total operating cost.

As many demand-responsive share rides in Japan are facing persistent deficits or decreasing use, or are unable to move up from fixed-period demonstration tests, Choisoko's achievement deserves credit as a successful case of rural MaaS.

Choisoko's success can be explained by the following four factors:

① Community-based approach

- Choisoko's operator Aisin is a local company based in Kariya City, which is a neighboring city to Toyoake City. The company seriously considers contributing to the local community and therefore is committed to providing demand-responsive share rides for local residents.
- Toyoake City Government is actively providing assistance to Aisin in service entry, member recruitment, increase of public awareness, and service expansion.
- The team in charge of Choisoko has been making unrelenting efforts to improve service recognition, usage, and profitability, while maintaining close communication with Toyoake City Government, area sponsors and other local companies, and residents' associations.

② Consistent improvement for higher user convenience

- Service operations are consistently improved based on customer needs, for instance, by discontinuing infrequently used bus stops and placing new bus stops at frequently visited facilities.
- Service experience improvements have been made by providing updated information via Choisoko Newsletter (direct mail) and by obtaining customer feedback via interviews.
- Consistent efforts have been made to increase ridership by providing coupons and discounts of restaurants and shops as well as planning guided tours within the region.

③ Contributing to area sponsors' sales

- Area sponsors have the incentive to support Choisoko because they can expect an increase in sales by having bus stops right in front of their stores or using the Choisoko Newsletter to target specific customers for their service promotion.

④ Actively extending the service to other areas

- To increase business profitability, Aisin is actively extending the service to other areas.
- Based on the successful model developed in Toyoake City, the Company is extending its service to provide a whole service package, comprising not only its service application but also its know-how as regards coordination with local stakeholders, and the process of obtaining approvals and licenses.
- Aisin has been very flexible by occasionally partnering with local entities with a strong presence when extending its service to other areas.

Interview

Why the Japanese Transportation Authority Wants to Achieve Rural MaaS

Hirohiko Shigeta

Director, New Mobility Service Division,
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Transport and Tourism

Note) This article is based on an interview held in January 6, 2020, and edited in accordance with the latest situation on the Revised Act on Revitalization and Rehabilitation of Local Public Transportation Systems.

Why a new division in charge of MaaS and new mobility services were established within MLIT in July 2019

KPMG: We heard that the New Mobility Service Division is a new division established in July 2019 within the Ministry of Land, Infrastructure, Transport and Tourism (MLIT). What was the reason for creating a new division in charge of MaaS and new mobility services?

Mr. Shigeta: MLIT's sections used to regulate businesses separately, mainly based on their mode of transportation, such as railway, automobile, aviation, or marine. However, a new concept of MaaS has emerged as a result of advancements in information technology and integrating different modes of transportation as a single package has become possible. The New Mobility Service Division was created to respond to this new trend in a timely manner, and also to integrate regulations and policies within the Ministry. Officials having different backgrounds were selected as members of my division. Before the establishment of our division, inquiries on MaaS had to be handled by the respective MLIT division in charge of each mode of transportation, however, now my division will be a single point of contact. My division's goal is to act as a hub for MLIT's MaaS strategy and handle an extensive range of topics including aviation, automobile, bus, taxi, railway, road infrastructure, and smart city project. In addition to industries familiar to MLIT, we are going to directly interact with IT and internet related services, industries MLIT was not familiar with before.

I would like to welcome any company with an interest in MaaS or new mobility services to contact us, regardless of their industry. I would like to mention that, in cooperation with METI's Automobile Division, my division acts as co-secretariat of the Smart Mobility Challenge Promotion Council, which is a collaborative activity by MLIT and METI.

Japanese MaaS differs from that of Europe and the U.S.

KPMG: The term "MaaS" has been used in Europe for a while and has started to be used in the United States recently. However, it seems that European MaaS and U.S. MaaS have different meanings. For example, in Finland and Sweden, a MaaS operator does not provide actual mobility services by itself and therefore, MaaS is a type of service which packages several mobility services provided by different service providers. On the contrary, in the United States, MaaS seems to be understood as a one-stop provider of mobility services by a single company. For your information, the word "Mobility on Demand (MOD)" was alternatively used by a U.S. representative in the ITS World Congress.

As we all know, the term "MaaS" is gradually becoming common in Japan. Are there any differences from Europe or the U.S. in mobility services or players we should take into consideration when developing Japanese MaaS?

Mr. Shigeta: We asked Japanese embassies in major countries across the world to do research on MaaS and found that mobility services provided with the name of "MaaS" can only be seen in few countries. As MaaS turned out to be less popular than originally expected, we have to be careful in using the term "MaaS" when sending out our information within Japan. One thing common in the world is that new technologies such as AI and IoT have been utilized to create new mobility services that improve users' convenience and that those services have widely expanded across the world.

When we look at the situation in Japan, we must understand that the meaning of public transportation differs from that of Europe. In Europe, public transportation is provided by the public sector. On the contrary, most public transportation including railways, buses, and taxis, is

provided by the private sector in Japan. During the high economic growth period, public transportation operators were able to gain profits not only from providing services but also from urban development projects. However, they are facing the necessity to transform their business model for public transportation services due to an economic downturn in recent years.

Major railway companies in Japan have started to provide MaaS services that combine bus and taxi services from stations together with their railway service, with some companies offering packaged tour services. These examples show that major railway companies had the potential to become MaaS providers. Even if they cannot profit from providing public transportation, they can combine a wide range of peripheral services, such as tourism, retail, healthcare, and welfare, together with public transportation services and then provide these services as their original MaaS package. This type of MaaS business model is particular to Japan and rarely seen in Europe. I find this example demonstrates a big potential of Japanese MaaS.

New legislation "the Revised Regional Public Transportation Revitalization Act" was enacted to promote rural MaaS

KPMG: A business model developed by major railway companies to combine real estate developers and retail businesses with public transportation services is a successful case born in Japan. I agree with Mr. Shigeta that major railway companies would like to become a major part of Japanese MaaS business. However, I would also like to add that IT and automotive industries must also be included as essential players of MaaS.

Mr. Shigeta: I would like to mention some thoughts about the Japanese rural MaaS. Currently, rural MaaS projects in Japan are usually led by local governments which need to tackle the challenge of ensuring necessary transportation means in its respective region. Then, projects are often implemented by local public transportation service operators collaborating with internet related service companies. Although this typical Japanese rural MaaS model seems to work well as a pilot project, the biggest challenge is how to gain profitability because it is very difficult for a new mobility service to ensure profitability in a rural area. As such, the role of new mobility services should be to maintain necessary transportation means while minimizing or reducing subsidies from local governments. I believe this concept is an ideal business model for Japanese rural MaaS that we should pursue.

KPMG: If local governments are expected to take the lead and utilize the ideas and know-how of the private sector, I think it is worth re-examining the classic concept of " semi-public corporation" and introducing a new model of public-private organization structure. Do you have any ideas on a public-private partnership model?

Mr. Shigeta: The new legislation "Revised Regional Public Transportation Revitalization Act" is intended to utilize all transportation means in rural areas. This is not limited to utilizing all kinds of transportation services in the region including fixed-route buses, community buses, school buses, and welfare buses, and it is also necessary to reconsider how to make better use of "private fee-based passenger transport services" to better serve local needs, with, needless to say, safety as a top priority.

I believe MaaS can be a powerful driver for such utilization. MaaS also creates incentives for local residents to go out and travel, which could eventually contribute to the local economy. Increasing the number of healthy elderly people is one of the primary goals of the healthcare and welfare policy, and therefore I would like to work closely with relevant sections in the Government.

Key elements for expanding rural MaaS across the country

KPMG: While minimum transportation services necessary to the area or society should be provided, gaining profit from the services alone is difficult. Consequently, service providers have no other choice but to rely on subsidies or financial support from municipalities. However, it is important to maintain room for service providers to generate sales and profits on their own, while reducing the dependency on subsidies to a certain level. This is the key to preventing service providers from solely depending on subsidies. In successful cases of rural MaaS like Choisoko in Toyoake City or Finnish company Kyyti's rural MaaS service, a good balance is maintained to utilize the strengths of both private and public sectors. What do you think are the key elements to ensure rural MaaS will expand across Japan?

Mr. Shigeta: Ideally, we need service operators with a strategic business mindset to expand their services to other areas after successfully implementing them in one area. I hope to see service operators maintaining their profit in total by extending their services to other areas, as generating profits in a single region is very difficult. However, I need to add that they must work in close cooperation with local governments because their services must tackle local transportation challenges.

New organization structure of MLIT in cooperation with municipalities To extend rural MaaS across Japan

KPMG: I understood that the New Mobility Service Division is the point of contact in MLIT. Is there any point of contact on MaaS within District Transport Bureaus in each region?

Mr. Shigeta: The Transportation Policy Planning Division under the Transportation Policy Department in each District Transport Bureau will be the contact point of MaaS. The section is in charge of holding workshops to promote MaaS, coordinating different organizations to start new projects, and providing information on MaaS-related subsidies and grants.

KPMG: It is clear that the Ministry sets the basic direction and that the Transportation Policy Planning Division within the District Transport Bureau provides support for solving local transportation challenges. By the way, do most service operators understand this structure?

Mr. Shigeta: Unfortunately, it is not widely known yet. However, I believe it will be known gradually because all applications for subsidies and projects need to be submitted to each District Transport Bureaus after April of 2020.
For your information, the "regional symposium", which is the regional version of the Smart Mobility Challenge Promotion Council, has been jointly organized by District Transport Bureaus and Economy, Trade, and Industry Bureaus.

Enabling public transportation providers to collaborate with other service providers

KPMG: In the wake of the MaaS boom, automobile and its peripheral industries, information technology and communication industry, trading companies, and retailers have begun to consider entering the mobility service market. How do you see their involvement in rural MaaS?

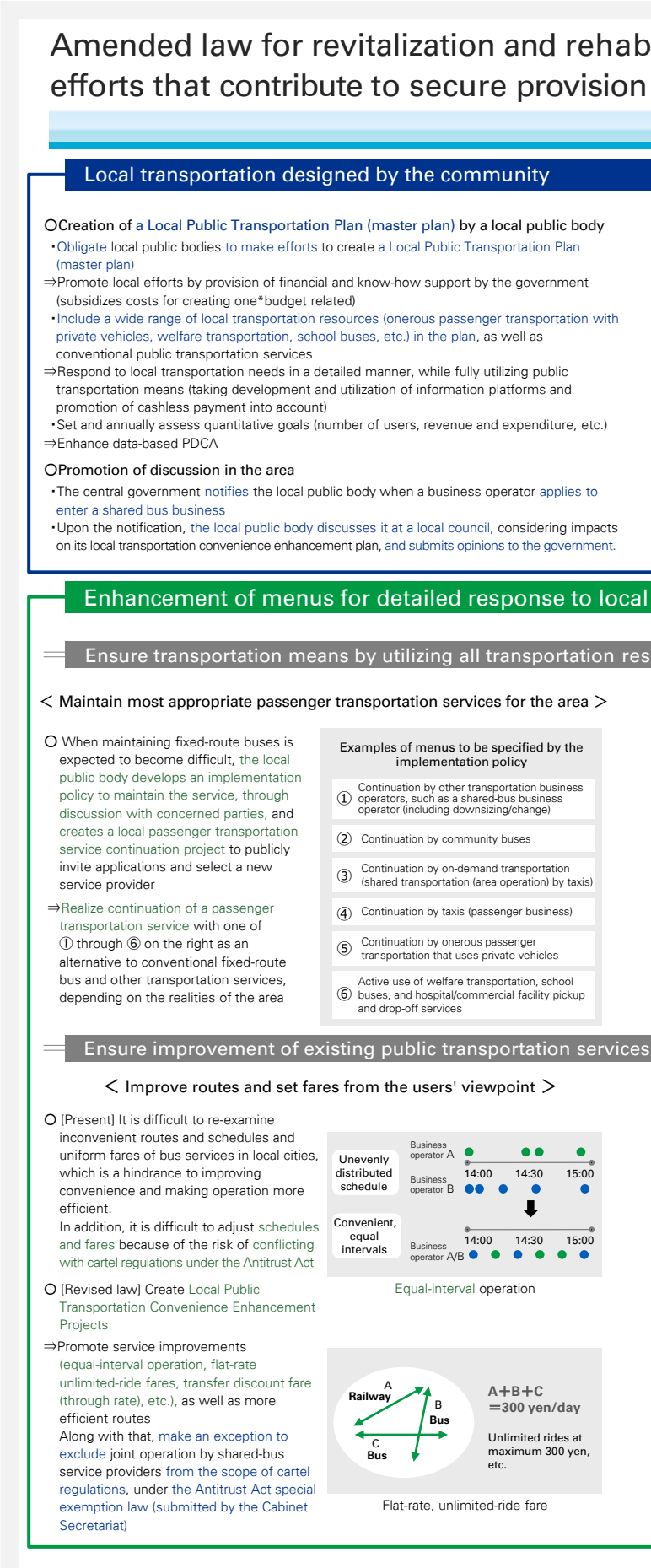
Mr. Shigeta: In the Revised Regional Public Transportation Revitalization Act, MaaS is defined and the smooth entry of MaaS operators is promoted. For this purpose, deregulation has been incorporated so that applications for fares can be integrated into a single procedure if an applicant needs to set fares for multiple modes of transportation. The Act also allows municipalities to freely organize a council with a wide range of concerned parties, such as travel agencies, retailers, healthcare, and welfare service providers, in addition to public transportation providers. Companies eager to provide rural MaaS in the region will be allowed to request municipalities to set up a council. Once a council is established, a framework for a wide range of concerned parties to work together should be created under the initiative of the municipality. I expect more and more companies with fresh ideas such as MaaS to lead the way in introducing various new mobility services, and as a result, succeed in building an ideal community based rural MaaS in each region.

Lessons learned from Finland

KPMG: Please tell us what we can learn from leading MaaS country Finland.

Mr. Shigeta: What we learned from Kyyti's case is that they created a business model for rural MaaS on their own. They commented that new services should be created based on public support because service operators need to be subsidized in low-traffic-density areas. This concept is incorporated into the new legislation.

We also studied Finnish Transport Service Act when we created guidelines for data coordination for MaaS. It is always helpful to be able to refer to examples of best practices or previous success stories. We would like to keep working closely with Finland as a leading MaaS country.



ilitation of local public transportation to promote of sustainable transportation services

MLIT

[Local Public Transportation Revitalization Act/Road Transportation Law]

Local Public Transportation Network Development Plan (revised in 2014)

(Created by a municipality or prefecture (with a municipality))

Promote development of a local public transportation network that is linked with town development

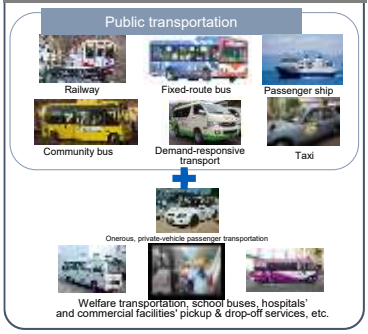
Local Public Transportation Plan (after the latest amendment)

(Created by a municipality or prefecture (with a municipality))

Create a local public transportation network that is linked with town development + Utilize all transportation resources in the area

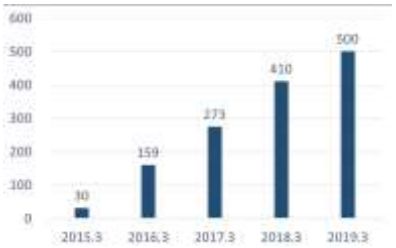
Ensure provision of sustainable passenger transportation services by improving menus and enhancing PDCA

Local passenger transportation service



State of development of Local Public Transportation Network Development Plans

The current objective (500 plans by the end of FY 2020) has been achieved



transportation needs [Local Public Transportation Revitalization Act/Road Transportation Law]

ources

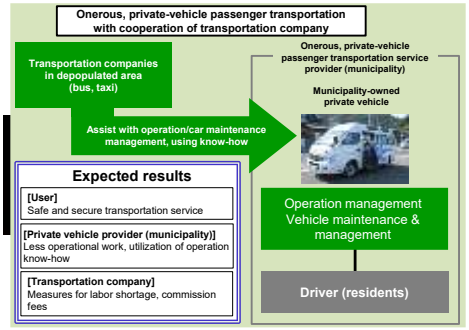
＜Facilitate onerous, private-vehicle passenger transportation＞

○Create a system that allows bus/taxi companies to help the municipality's onerous private-vehicle passenger transportation in depopulated areas with operation management and vehicle maintenance

⇒facilitate the implementation and improve transportation safety at the same time

○Specify visitors including tourists, as well as residents, as users

⇒Respond to needs in tourism, including inbound business



＜ Facilitate procedures for transporting passengers and cargo together ＞

○Create "projects for effective cargo/passenger transportation" for trains and shared buses to transport cargo and passengers together

⇒Promote productivity of passenger/ cargo transportation services

Cargo/passenger transport

< Measures for facilitating dissemination of MaaS >

※MaaS：Mobility as a Service

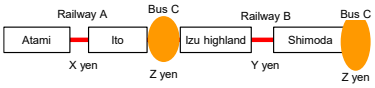
○Create an approval system for new mobility service business plans that are developed by transportation business operators participating in MaaS

⇒Integrate procedures for fare setting into one for transportation business operators

○Create a council system for MaaS

⇒Promote discussion/cooperation among various participating concerned parties

Example of MaaS (Izu)



Provide a free pass for multiple transportation services

Enhance support for transportation infrastructures

[Local Public Transportation Revitalization Act / Promotion of Comprehensivization and Improvement of Efficiency of Distribution Operations Act]

○Add development of the following transportation infrastructures, in addition to LRT and BRT, to the scope of the fund loan system of the Japan Railway Construction, Transport and Technology Agency (* budget related)

・Develop railways that are approved under the Local Public Transportation Revitalization Act

⇒Improve transportation networks

・Develop logistics bases (truck terminals, etc.) that are approved under the Promotion of Comprehensivization and Improvement of Efficiency of Distribution Operations Act

⇒Promote efficient logistics through cooperation of multiple business operators

Railway infrastructure

Logistics base

Source: New Mobility Service Division, Policy Bureau, Ministry of Land, Infrastructure, Transport and Tourism

Hypothesis

What are the Requirements for a Sustainable Provision of Rural MaaS?

Many rural public transportation services keep shrinking due to increasing dependence on individual private cars, population decline, and deterioration of central urban areas. In addition to these trends, the shortage and aging of professional drivers are putting pressure on fixed-route buses and taxis to shrink even further.

Considering the fact that the population is further aging and more schools are being consolidated in rural areas, the decline of public transportation systems and taxi companies could worsen depopulation. Consequently, ensuring minimum necessary transportation means for local residents is becoming more and more important and expectations for rural MaaS are increasing.

However, many of the existing rural MaaS projects lack a decisive factor as a solution, or they are mere demonstration tests introduced temporarily. Therefore, it is critical for rural communities to have convenient rural MaaS services provided by operators in a sustainable manner.

In this section, based on a hypothesis, requirements for a sustainable provision of rural MaaS are presented.

1) User friendliness

The most important point for a rural MaaS to be provided as a sustainable service is whether it is user friendly or not. Most rural residents are accustomed to using their personal car for traveling, thus inconveniences, such as poor access to service points (e.g., a bus stop) or transfers with long waiting times, will likely make it less attractive for local users to use the service. Some of the demand-responsive transport services provided in rural areas are said to be inconvenient for users: for example, users need to transfer to a fixed-route bus to reach the urban area, or they cannot go to the places they need to the most because they are located outside of service areas.

In addition, in some cases of private fee-based passenger transport services, users can use the service to go to their destinations from their homes but they are not allowed to use it for their return trip, and therefore they need to use fixed-route buses or taxis to go home.

With regard to service fees, ideally, the price range should be set between bus fares and taxi fares at an appropriate price point to provide convenience for users and profitability for the business operator. However, service fees have been set in an unbalanced manner in many cases, because regulatory restrictions only allow bus or taxi derived services.

Unfortunately, many of the mobility services currently provided are not useful enough for users, because operators tend to cling to conventional business models and maintain current management resource allocation without responding to social and economic shifts, resulting in their services remaining within the frameworks of existing regulations and business practices. Furthermore, while a great number of demonstration tests are underway, including national projects, many of them are time-limited or free of charge. Service fees are often set without considering the possibility of introducing the service permanently. Such approaches cannot effectively measure the true needs of local residents, possibly creating a large gap between what the service offers and what users actually need, and as a consequence end up only as demonstration projects, and no permanent service will be introduced later.

On the contrary, Choisoko's service in Toyoake, as described earlier, was launched as an actual service and became a paid service with a fee of 200 yen (approximately $2 or €2) in April 2019. In addition, the company has been making efforts to maintain user convenience, reviewing the bus routes and bus stop locations in consideration of sponsor companies' and users' opinions.

To make rural MaaS user-friendly, the strong intention of service operators to introduce it as an actual service is essential. Operators must be careful not to be strongly affected by current regulatory frameworks or conventional business practices.

2) Existence of operators who have the potential to provide the service sustainably

Regardless of how the mobility service is provided, local residents can only depend on the service when there exists an operator with the intention of providing the service on a continuous basis. Candidates for the operator include public transportation companies that provide fixed-route buses and other services, local taxi companies, local non-profit companies, and new mobility service providers. **There are three key questions to ask when selecting one: "Which service operator is trying to provide the most appropriate service, based on the mobility challenges the area is facing and user needs in the area?," "Does the service operator have the intention of sustainably providing the service" and "Is the business model profitable?" The motivation of potential service operators largely depends on the support the local government or government can offer, as described in requirement (3).**

In most cases, new mobility services are provided by new companies (or projects) that are not local to the target areas, and these new companies usually work together with local transportation companies, supported by local governments. **The role of local governments is essential to the success of rural MaaS because local governments can play an adhesive-agent-like role and encourage private companies to be committed to rural areas.**

3) Strong support from the central and local governments

It is obvious from the cases of Kyyti and Choisoko that it is difficult to implement rural MaaS as an independent, profitable service. Furthermore, as described in requirements (1) and (2), as long as the existing traffic order and regulatory frameworks underlie the implementation of rural MaaS, the provision of services that would fulfill real user needs will become difficult and the emergence of an operator to provide a sustainable service with a commitment to the area cannot be expected. **Both central and local governments must support rural MaaS financially as well as legally so that user needs are met and minimum necessary transportation methods will be maintained with a certain level of subsidies.**

With the establishment of the Revised Regional Public Transportation Revitalization Act, an ecosystem has become available to allow MLIT and District Transport Bureaus to provide full assistance "in designing a local transportation system by the community itself." **It is desirable that the local government firmly supports the new mobility service provider while MLIT and District Transport Bureaus enforce regulations flexibly according to local interests and transport needs.**

In many cases, existing mobility services were not able to fulfill user needs, interests of local governments, or business interests of service operators, due to restrictions on ① vehicle registration, ② the type of driving license required by the driver (e.g., Class 2 license), ③ consideration for existing bus services, and ④ flexibility in setting fares. These restrictions are expected to be relaxed by enforcement of the Revised Regional Public Transportation Revitalization Act.

In addition, for service operators to provide a service in a sustainable manner, an incentive that allows them to increase sales and profits through their own efforts must be incorporated in the system. In the case of Finland, when a patient living in a rural area goes to hospital by taxi, the cost is mostly covered by their health insurance, and therefore, financial support is guaranteed for mobility service providers, such as Kyyti.

The Finnish system provides an incentive for business efforts, allowing mobility service providers to gain new business opportunities by selling vacant taxi seats to general passengers. On the other hand, in the case of Choisoko Service, municipal subsidies are likely to be reduced if service providers are able to increase revenue from sponsor companies, and as such, service providers' sales and profits gained by their own business efforts are not guaranteed. It is therefore **expected that a framework will be established where a certain amount of subsidies necessary for maintaining rural transportation is set by the central and local government, and if business operators gain additional sales and profits by their own efforts, additional income is guaranteed to be kept by them.**

4) Business model applicable to other areas/countries

When the Japanese economy was growing and the population was increasing, transportation service companies were able to find opportunities to earn sufficient revenue just by providing various community-based transportation services. However, it is becoming difficult for local transportation companies to survive without some transformation due to monopolar centralization to Tokyo, higher dependence on private cars, deterioration of central urban areas, and a shortage of drivers.

In contrast, business operators providing new mobility services that took shape in other countries, such as ridesharing, car sharing, and e-scooter sharing, are significantly improving business efficiency and profitability by introducing new, community-based mobility services and then, after they gain popularity, extending them to other areas and countries.

As population decline is unavoidable, **rural MaaS service providers must be able to expand their business models to other areas and countries, so that they can improve business efficiency and profitability.**

For this purpose, it is essential to create new partnerships between community-based business operators and nationwide enterprises so that both parties can work together to develop services applicable to local regions but also expandable to other areas and possibly overseas.

In this section, four components were presented as requirements for a sustainable provision of rural MaaS. However, various unexpected challenges might become clear as more and more organizations enter the rural MaaS market. To solve such challenges and increase the chance of succeeding, establishing an ecosystem that allows the government, municipalities, and business operators to work together, following a PDCA cycle, would also be necessary. We hope that this report will serve as a guidebook for many rural MaaS stakeholders and that sustainable services will be provided across the country, with local transportation companies, new mobility service providers, local governments, and the central government building new partnerships and playing unprecedented roles.

Requirements for sustainable provision of rural MaaS

1 User-friendly service

- ☐ Is it easy for users to get to riding points?
- ☐ Is the waiting time short?
- ☐ Do users need to transfer?
- ☐ Is the service available at a certain frequency?
- ☐ Is the service fee reasonable?

2 Existence of operators who have the potential to provide services sustainably

- ☐ Is there a service operator willing to cope with the real needs of local communities?
- ☐ Is there a service operator who intends to provide a service on a continuous basis?
- ☐ Does the service operator have a profitable business model?

3 Strong support from the central and local governments

- ☐ Is a certain amount of financial support guaranteed by the local government with the aim of maintaining minimum necessary transportation?
- ☐ Have relevant regulations been flexibly applied to the area by MLIT and the District Transport Bureau?
- ☐ Does the underlying structure allow the service operator to increase its sales and profits through its own efforts?

4 Business model applicable to other areas/countries

- ☐ Is the business model applicable not only to a specific region but also to other areas and countries?
- ☐ Do community-based service operators and nationwide enterprises work together to develop the service?

About KPMG Mobility Research Japan

With the automobile industry undergoing drastic changes, the transport of people and goods, or mobility, has become one of the key themes that have a significant impact on global industrial structures, in the wake of the advancement of three innovative technologies: environments for electric automobiles, widespread use of connected and autonomous vehicles, and mobility as a service (MaaS), which is represented by carsharing.

Mobility in local cities also follows the trend and there is an expectation that the utilization of next-generation mobility will be a solution to the transportation challenges arising from population outflow and aging. Sustainable solutions have been discussed across the world, as well as in Japan. To solve mobility challenges in local cities, knowledge must be gathered from diverse fields, including energy, industrial machinery, finance, telecommunications, and civil service, as well as the key players, automobile and transportation industries, and possible solutions must be actively discussed among industry, government, and academia.

KPMG Mobility Research Japan captures changes in social structures from a single viewpoint, mobility, and conducts research on it using cross-sectional approaches, in global cooperation with relevant overseas research groups and KPMG Japan's industrial sectors. The organization aims to contribute to the future development of mobility in Japan, acting as the hub for industry, government, and academia.

Overview

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