

Suggestions for Continuous Cooperation Derived from Cases of Services Supporting People with Limited Access to Shopping Facilities

**Ken-ichi KUDO, Atsushi KIMURA,
Hiroyuki NOZAKI and Kazumasa UEDA**

Nomura Research Institute

Suggestions for Continuous Cooperation Derived from Cases of Services Supporting People with Limited Access to Shopping Facilities

Ken-ichi KUDO, Atsushi KIMURA,
Hiroyuki NOZAKI and Kazumasa UEDA

- I Overview of Research
- II Existing Literature
- III Study of Service Cases
- IV Required Activities to Enable Continuous Cooperation
- V Suggestions for Continuous Cooperation and Challenges to Address

Against a backdrop of a declining and aging population and increased motorization, the number of stores located within walking distance of community residents is decreasing and the availability of public transportation is diminishing in depopulated areas. As people age, they find it difficult to drive to stores some distance away. According to our projections, all over Japan, about 6.8 million people face limited access to shopping facilities. In an attempt to offer suggestions for launching and continuing services aimed at assisting these people, we selected 24 service cases and classified them into three categories, namely, (1) small lifestyle-related service facilities (small bases), (2) transportation of merchandise and (3) transportation of people. Based on our research results, we derived the following suggestions to ensure continuous cooperation among multiple entities in different sectors such as private sector enterprises, community residents and the national and local governments. These suggestions are: (1) setting up small lifestyle-related service facilities (small bases), (2) rebuilding distribution and transportation networks, (3) sharing distribution functions among businesses, residents and the government, (4) sharing business resources and (5) establishing a balance between public benefit and profitability.

I Overview of Research

1 Background

The purchasing behavior of Japanese people is such that little stock is stored at home and frequent shopping trips are made to make unscheduled purchases (spot purchases). To cater to this purchasing behavior, traditionally, there have been many small- and medium-sized retailers who serve relatively small commercial areas in Japan.

On the other hand, for items that take only a short time to select, such as groceries, a one-stop shopping format in which several items can be purchased at the same time tends to quickly expand. For this reason, supermarkets have become commonplace, while small- and medium-sized traditional retailers that sell only a single product category have been disappearing. In addition, as many small- and medium-sized retailers switch their businesses over to convenience stores that sell a wide range of products, it has become even more difficult for other such retailers in the neighborhood to survive.

Furthermore, against a backdrop of increased motorization in rural areas and the deregulation of large-scale retail store locations, there has been an increase in large-scale retail facilities such as shopping centers in the suburbs. Because of such increase, people are seeing the closing of not only small- and medium-sized retailers but also supermarkets within walking distance of their homes. At the same time, the relaxation of regulations imposed on passenger transport businesses concerning the withdrawal from services has led to a decrease in or even the abolishment of public transport services such as buses that take people from nearby bus stops to areas where they can shop.

In 2000, Japan entered an era of a serious population decline, resulting in falling populations in those market areas where, in the past, there were enough people to

support the retail industry. In addition, as people age, their mobility decreases because of reasons such as their no longer being able to drive a car to a shopping area some distance away.

In this way, those people who do not have shops or bus stops within walking distance and who are not able to drive find that day-to-day shopping is extremely inconvenient. They are known as “people with limited access to shopping facilities” (Figure 1). While there is no precise definition of “people with limited access to shopping facilities,” in this research, we defined provisionally and for the sake of convenience that they are “people aged 60 or over who find everyday shopping difficult.”

According to the 2011 survey²² conducted by the Director General for Policies on Cohesive Society, Cabinet Office, Government of Japan, among men and women aged 60 and above throughout the country, 17.1 percent responded that they “find day-to-day shopping difficult.” This figure is up from 11.6 percent in the 2001 survey and 16.6 percent in the 2005 survey, and is on an increasing trend. When the increase in the elderly population itself is taken into account based on Population Estimates 2011¹⁹ published by the Statistics Bureau, Ministry of Internal Affairs and Communications, the number of people with limited access to shopping facilities totaled 3.6 million in 2001, 5.7 million in 2005 and 6.8 million in 2010. As such, the number has increased by 1.9 times at an average annual rate of 7.4 percent over these nine years (Figure 2). The survey also implies a typical image of women aged 70 to 84 in relatively poor health who live in towns and villages and who only go out about once a week. However, it should also be noted that municipalities where a larger number of people with limited access to shopping facilities are found are not just towns and villages, but rather are middle-sized cities (cities with a population of 100,000 or more, excluding Tokyo’s 23 wards and cities with a population of 500,000 or more).

Figure 1. Environment giving rise to people with limited access to shopping facilities

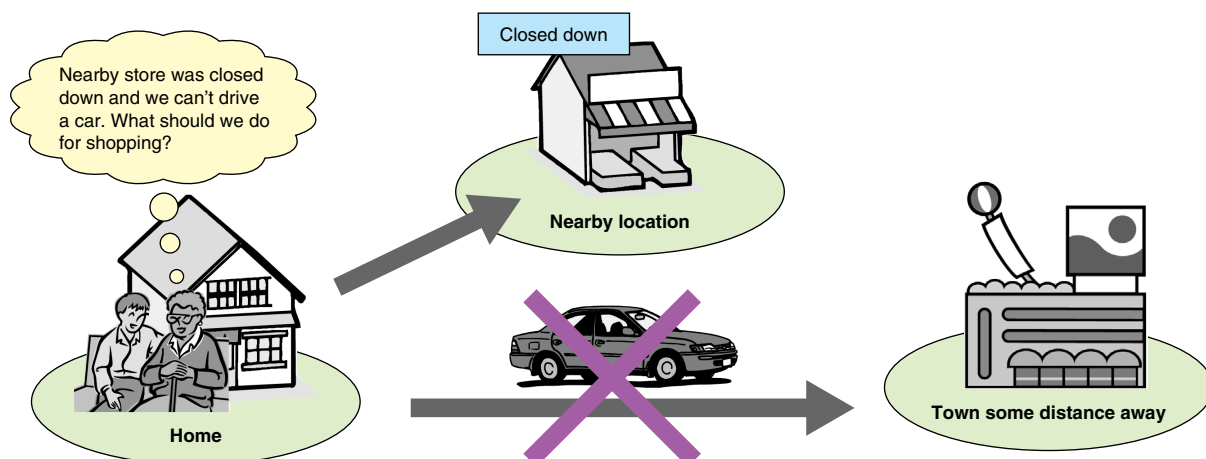
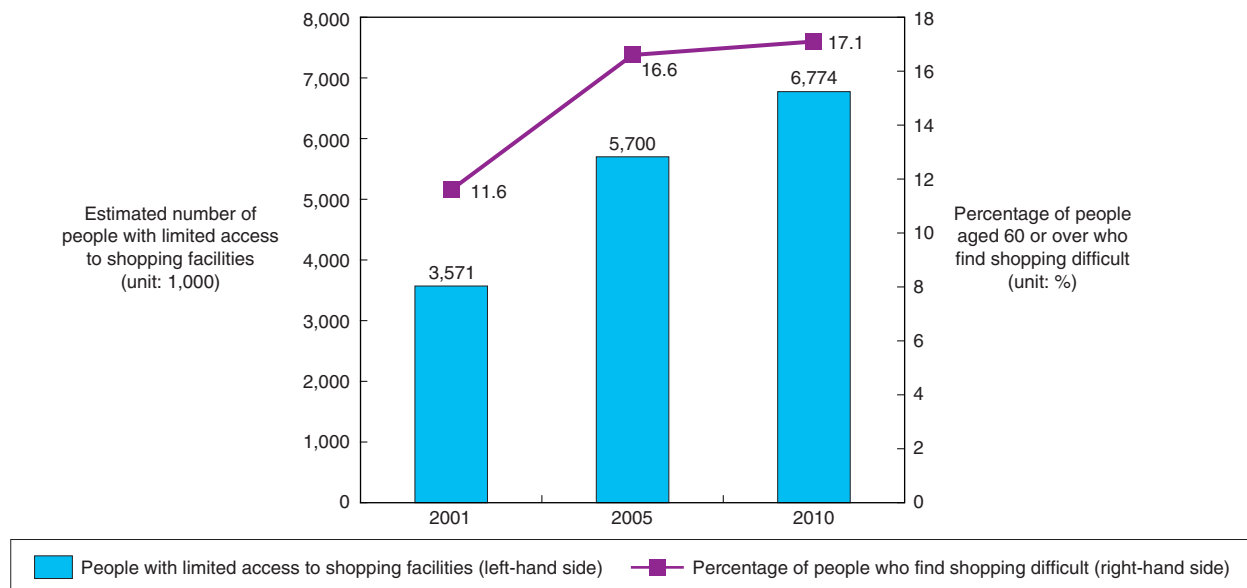


Figure 2. Increase in the number of people with limited access to shopping facilities

Source: Compiled based on the 2011 survey²² conducted by the Director General for Policies on Cohesive Society, Cabinet Office, Government of Japan and “Population Estimates 2011”¹⁹ published by the Statistics Bureau, Ministry of Internal Affairs and Communications.

On the other hand, when a previously established market has disappeared, it is difficult for a distributor, a transportation company, a logistics company, residents or the local government to single-handedly restart and maintain services. Therefore, it will be necessary to establish and continue the new types of businesses that eliminate the difficulty that people face in shopping and that support more stable lifestyles in a community through the cooperation of multiple entities in different sectors, which provide their respective service resources beyond the boundaries of private-sector businesses, public service projects and community activities.

2 Purpose

Upon recognizing this situation, the Ministry of Economy, Trade and Industry published the Shopping Accessibility Aid Manual—Supporting People with Limited Access to Shopping Facilities¹⁶ for the purpose of effectively launching and efficiently continuing services assisting such people, which are tailored to the specific characteristics of each community, through the cooperation of many entities in different sectors such as private sector companies, non-profit organizations, community residents and the national and local governments.

The objective of this research is to provide suggestions regarding the actions required to enable continuous, long-term cooperation by reconsidering the cases of services presented in the Shopping Accessibility Aid Manual from a more general point of view.

3 Contents of the research

In this research, we first examined the existing literature, and then categorized the cases of services presented, and

considered the characteristics of each category. Upon such consideration, we propose suggestions regarding the activities required to enable continuous, long-term cooperation.

4 Research targets and methods

In this research, from among the cases of services identified based on the existing literature and interviews that we conducted, 24 were selected and classified into three types from the perspectives of long-term continuity, the possibility of expansion to other areas and the degree of cooperation among multiple entities. We compared and considered these cases.

II Existing Literature

1 People with transport difficulties

In the fields of civil engineering and urban planning, studies have been made of the transport difficulties faced by disabled persons and elderly people from a relatively long time ago, such as Mihoshi (1991)²⁶, Habu (1992)²³ and Mihoshi (1997)²⁷. Based on the survey of the actual status in Habikino City, etc., these studies reported that transport difficulties are caused by physical disabilities and aging, with more women than men being affected. The studies also found that people who are not disabled or elderly (elderly people are defined as being 65 or older in these studies) but who face transport difficulties accounted for 17 percent.

In addition, Akiyama (2009)⁵ looked at how to provide a means of transportation to persons facing transport difficulties (or persons with mobility problems),

thoroughly and concretely covering both theory and actual cases. As to governmental action, the Transport Planning Division, Policy Bureau, Ministry of Land, Infrastructure and Transport (2008)¹¹ has collected and published examples of the revitalization and rejuvenation of local public transportation.

Many studies were made in the field of transportation because reductions in the number of public transportation routes or even their complete closure, such as of trains and buses, and how to provide a means of transportation for disabled persons and elderly people constituted major research themes. However, because the main target of the research in these studies was passenger transportation, the reports barely touched on the relationships with cargo transportation or retail businesses although they discussed the relationships with social welfare.

2 Food deserts

In the field of nutrition, researchers have been looking at the issue of food deserts since around 2000. The term “food deserts” is defined as those areas where it is difficult to obtain nutritious food including fresh produce (Whitehead (1998)³, Wrigley (2002a)⁴), and was first used by the Low Income Project Team of the Nutrition Task Force set up by the UK Department of Health (Beaumont (1995)¹). Furthermore, in the U.S., according to Sharkey (2008)², 20 percent or more of rural Texas residents must travel at least 7.6 km to the nearest convenience store to buy groceries and there is concern about the nutritional status of these people. In Europe and the U.S., the trend towards motorization, the growth of supercenters (hypermarkets) and a gap between the rich and the poor are much more pronounced than such phenomena in Japan to the point where concerns are voiced about the health of the poor and elderly who do not have access to or can no longer drive a car.

In the field of geography, based on the above-mentioned studies of nutrition, Komaki (2007)¹⁴, Araki (2007)⁶, Komaki (2010)¹⁵ and Iwama (2010)⁸ used a geographic information system (GIS) to apply these research results to Japan and created a map of food deserts existing in the country.

These studies have been very effective in projecting and visualizing the current situation, that is, where people with limited access to shopping facilities are and how many such people there are. However, these studies are not designed to provide suggestions about specific measures to provide services to assist such people.

3 People with limited access to shopping facilities

In the field of architecture, based on the studies of transportation difficulties mentioned above, Hino (2002)²⁴ looked at difficulties in shopping against a backdrop of

an increasing number of elderly singles and couples who are living by themselves.

On the other hand, Sugita (2008)¹⁸ raised the issue of “shopping refugees,” which draws attention to the plight of seniors, who are particularly vulnerable within society. Sugita noted that the progress of motorization and the deregulation of large-scale retailers have led to an increasingly difficult lifestyle for seniors who have to rely on walking as their only means of getting around. He proposed that the government should strengthen the regulations governing the provision of public transport routes and the closing down of retail stores; retail businesses should provide an alternative means when they withdraw from a certain area; and local residents should support neighborhood stores by buying goods at these stores.

The government has also found that the functions provided by retail stores are not simply limited to those of providing services in a competitive market involving private-sector enterprises, but that in recent years, their functions began to include those as part of social infrastructure (the Study Group on the Role of Convenience Stores as Social Infrastructure (2009)¹⁷, the Ministry of Economy, Trade and Industry (METI) and the Study Group on the Role of Distribution Systems in Community Infrastructure (2010)²¹, METI). The Shopping Accessibility Aid Manual published by METI (2011)¹⁶ is a part of the outcome of these studies. This paper also uses these studies as a base to consider the continuity of services through cooperation among private sector enterprises, community residents and the national and local governments.

III Study of Service Cases

1 Classification of services

As shown in Figure 3, the METI Manual (2011)¹⁶ classified the methods used to assist people with limited access to shopping facilities into three types. They are (1) setting up stores somewhere close to people with limited access to shopping facilities, (2) delivering merchandise to the homes of those people and (3) making it easier for them to go out. These three supporting methods respectively correspond to (1) small bases, (2) the transportation of merchandise and (3) the transportation of people, as indicated in Table 1. Any of these categories are infeasible if any of the following businesses is not available: retail, freight and passenger transportation. The Manual suggests the possibility of efficiently and continuously supporting people with limited access to shopping facilities by optimally combining these businesses across industry sectors.

Of these three categories, “(1) small bases” refers to small stores in a small market area. According to a survey conducted by the Urban Transportation Planning

Figure 3. Classification of services

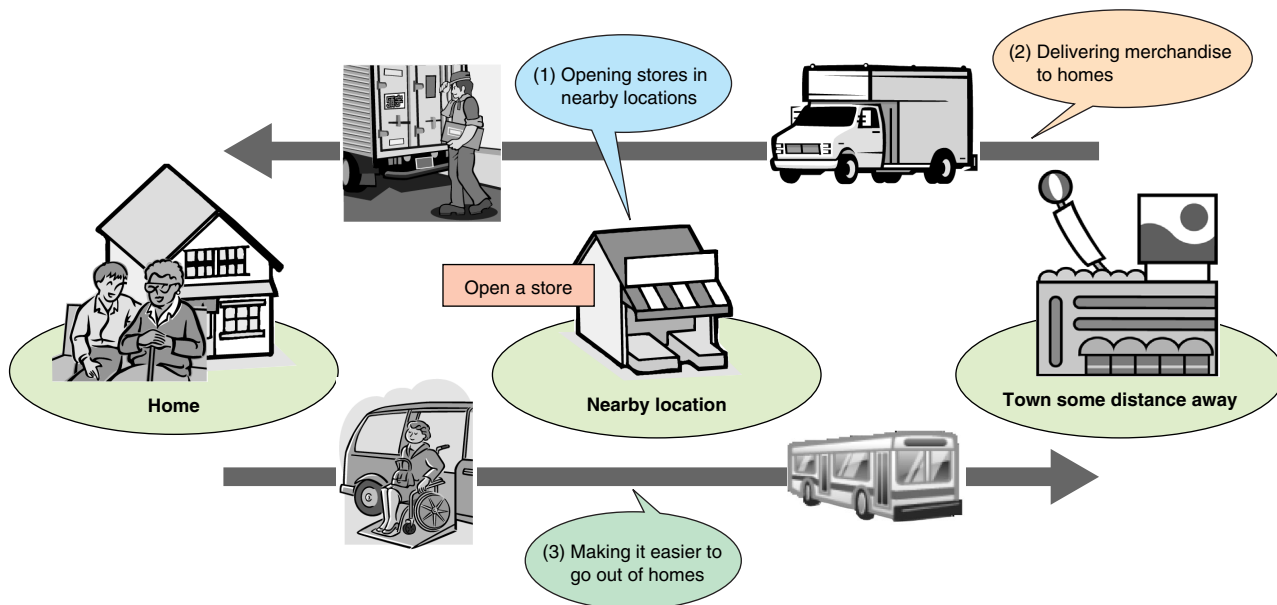


Table 1. Classification of services

Supporting method (Category)	Outline	Examples
(1) Opening stores in nearby locations (Small bases)	Opening small stores (small bases) within walking distance where daily necessities and services are provided.	Convenience stores in sparsely populated areas, mini supermarkets, etc.
(2) Delivering merchandise to homes (Transportation of merchandise)	Mobile grocery vending: Merchandise is shipped from urban distribution centers and delivered to small bases by making the rounds of such bases to provide goods and services that are not available at such bases.	Mobile grocery vending, operating booths, etc.
	Home delivery: Delivering heavy goods, etc. from small bases to individual homes.	Home deliveries, “net super” (online supermarkets), etc.
(3) Making it easier to go out (Transportation of people)	Bus type: By providing routes that start and end in urban areas and making the rounds of small bases, buses enable people to go to urban areas where goods and services that are not available at small bases are available.	Community buses, demand responsive transport, etc.
	Taxi type: Taxis visit individual homes to take shoppers to and from small bases.	Demand responsive transport, shared taxis, paid transportation in sparsely populated areas, etc.

Office, City Planning Division, City and Regional Development Bureau, Ministry of Land, Infrastructure and Transport (2008)¹², the median distance that seniors aged 65 or over can walk is about 1 km. Therefore, the area served by one of these small bases should have a radius of no more than 1 km. Generally speaking, such facilities should be set up in each community in the case of towns and villages and in each residential block in the case of large cities. It would be sufficient if the floor space of each store were in the same order as that of a typical convenience store, that is, around 100 m².

However, the importance of small bases (Category (1)) is not limited to a simple retail function. Rather, small bases should also act as relay points for the transportation of merchandise (Category (2)) and the transportation of people (Category (3)). That is, they should serve as locations for temporary storage or transfer. Such function would make it possible to maintain levels of service by assuring the efficiency of the network. The

importance of such nearby base functions (small bases) was also described in the report published by the Study Committee on Community Issues, Policy Group, National Land Development Council (2008)¹³ (Table 2). Discussions with not only distributors but also with people engaged in medical services and disaster preparedness activities confirmed that small bases are expected to provide safe, reliable lifestyle-related services by consolidating the functions listed in Table 3 in a compact manner.

Next, the transportation of merchandise, Category (2), can be broadly divided into mobile grocery vending and home delivery. Mobile grocery vending employs the above-mentioned small bases as stations, and generally adopts a format of “a fixed route, fixed schedule and selling at each small base.” On the other hand, home delivery often involves a format of “a non-fixed route, non-fixed schedule and delivering to each individual home” in which deliveries are made to individual homes

Table 2. Overview of a small base

A wide variety of facilities are considered necessary for a “small base” such as clinics, nursing care facilities, shops selling groceries and daily necessities, financial institutions enabling people to withdraw cash such as pension benefits, community meeting places, libraries, post offices, child day care centers, processing facilities and direct sales shops for primary products, and coffee shops. All of these facilities should be located within walking distance so that even seniors and others who cannot drive a car can satisfy their needs on a one-stop basis.

A “small base” where all such diverse facilities are located can also be expected to fulfill the role of rebuilding community “ties” by functioning as the place where people meet, talk and interact.

(Omitted)

Setting up a “small base” and providing a means of access to this base will be realized through the participation of many entities in different sectors such as residents’ associations, non-profit organizations (NPOs), agricultural cooperative associations, consumers’ cooperative associations, transportation companies, local governments, etc. It is important to provide events where efforts are made to form a consensus among these diverse entities.

Source: Excerpt from the report published by the Study Committee on Community Issues, Policy Group, National Land Development Council (2008)¹³.

Table 3. Functions required of a small base

- ① Supplying beverages and groceries including perishables
- ② Providing medical and health care services and prescription medications for medical treatment by professionals
- ③ Functioning as a place where people can interact and enjoy conversation
- ④ Functioning as the transfer/transshipment point for passenger and freight transportation
- ⑤ Providing the minimum level of financial functions such as bill payments and cash withdrawals
- ⑥ Providing a means of communications by means of a wireless LAN

at times and dates designated by customers. However, in the case of membership grocery home deliveries, deliveries are made to registered individual homes at fixed times and dates, which entails a format of “a fixed route, fixed schedule and delivering to each individual home.”

In the case of mobile grocery vending, merchandise is shipped from urban distribution centers or large stores and delivered to multiple small bases by making the rounds of such bases, which is expected to improve load efficiency and daily sales volume. In the case of home deliveries, small bases are used as depots (temporary storage, transshipment points). By separating the main distribution network (using, for example, 1- to 2-ton trucks) from local delivery networks (using hand trucks or bicycles with trailers), a high level of service can be maintained in local delivery networks without compromising main distribution efficiency.

Finally, the transportation of people, Category (3), can be roughly divided into that by bus and that by taxi. Buses generally adopt a format of “a fixed route, fixed schedule and for the unit of each small base” in which buses use small bases as bus stops and run on fixed schedules. Taxis often involve a format of “a non-fixed route, non-fixed schedule and for the unit of each individual home” in which taxis serve individual homes at any time as needed. However, shared taxis and demand responsive transport (DRT) fall under an in-between format such as “a non-fixed route, non-fixed schedule and for the unit of each small base.”

If the bus type were to have routes starting and terminating in urban areas where there are many shops and services and make the rounds of multiple small bases, it could be expected to improve the efficiency of bus oper-

ations and fare income per round. On the other hand, by using small bases as transfer points and by separating the bus type network that acts as the main network from the taxi type network that acts as the local network, the taxi type would be able to maintain a high level of service in the local network without diminishing the efficiency of the main network.

2 Selected service cases

From among the service cases that we have come to know based on the existing literature including newspaper articles and through interviews with service providers, we selected 24 cases that fall under three categories from the perspectives of long-term continuity, possibility to develop in other regions and cooperation among multiple entities (Table 4). In selecting these services, we considered a balance between categories, a balance between regions, a balance between urban areas and sparsely populated areas and which sector serves as a service provider, that is, a private sector enterprise, a public service entity or community residents. Based on such considerations, we selected nine cases for the “small base” category, two for the “mobile grocery vending” sub-category, six for the “home delivery” sub-category, six for the “bus type” sub-category and one for the “taxi type” sub-category. While there are three cases that use automobiles such as taxis, the number of cases that fall under the taxi type in the service sub-category is limited. While “Local Coop Station” service is classified in the home delivery sub-category in the Manual¹⁶ published by METI in 2011, we classified this service in the small base category because we believe that this service

Table 4. Service cases

Category	Sub-category	Case	Service provider	Region	Private sector enterprise	Public service entity	Local government	Community residents
Small bases		Y Shop, JACK Osaki, Yamazaki	Yamazaki Baking Co., Ltd.	Hiroshima	SP	CE		CE
		City Market	Zennihon Shokuhin	Nationwide	SP			
		Maruetsu Petit	The Maruetsu, Inc.	Urban areas	SP			
		Convenience stores in sparsely populated areas	Seicomart Company Ltd.	Hokkaido	SP	CE		
		Small-scale joint delivery by wholesalers	DCD Ltd.	Shimane	SP	CE		
		No-son Club	Yabakei No-son Club	Oita	CE			SP
		Aoken	Chuo Aozora Kikaku	Kumamoto	CE	SP		
		Yamato Friendly Shop	Yamato	Yamanashi	SP		CE	
		Local Coop Station	Saitama Co-op	Saitama	CE	SP		CE
Transportation of merchandise	Mobile grocery vending	Happy Liner	Sun Plaza Co., Ltd.	Kochi	SP		CE	CE
		Hearts Delivery	Fukui Co-op	Fukui		SP	CE	CE
	Home delivery	Easy Shopping System	Kengun Shopping Center	Kumamoto	CE	SP		
		Home delivery for elderly people	Super Sanshi Co., Ltd.	Mie	SP			
		Net Super for mountainous areas	Okuwa Co., Ltd.	Wakayama	SP		CE	CE
		Seven Meal	Seven-Eleven Japan Co., Ltd.	Nationwide	SP		CE	
		Faithful Delivery	Nishiwaga Town Social Welfare Council	Iwate	CE			SP
Home delivery supermarket project	EveryD. Com, Inc.	Kyushu	SP					
Transportation of people	Bus type	Kirara-chan Bus	Community Development Bus Tsuchiura	Ibaraki	CE	CE	CE	SP
		Ao Bus	Aobadai Community Bus Project Committee	Chiba	CE		CE	SP
		Life Bus Yokkaichi	Life Bus Yokkaichi	Mie	CE		CE	SP
		Shopping Bus	Co-op Sapporo	Hokkaido	CE	SP		CE
		Odekake Bus	Kegoya Genkimaru (NPO)	Hiroshima	CE		CE	SP
		On-demand bus service	Committee for Promoting Public Transportation in Hokuto city	Yamanashi	CE	CE		SP
	Taxi type	Welfare fare-paying transportation in sparsely populated areas	Sai Village Social Welfare Council	Aomori	CE		CE	SP

Notes: 1) While "Local Coop Station" was classified in the home delivery sub-category in the Manual¹⁶ published by METI in 2011, it was considered more appropriate to classify it in the small base category. 2) SP = service provider, CE = cooperating entity. 3) Private sector enterprises refer to corporations, limited liability companies and sole proprietors. Public service entities include associations, public corporations and universities. Community residents refer to those who are group leaders, caregivers and volunteers in organizations such as NPOs and social welfare councils.

fulfills the major functions required of a small base, which were described in Table 3.

In indicating service providers and cooperating entities in Table 4, public service entities refer to those operating for non-profit purposes such as consumers' cooperatives, agricultural cooperatives, business associations, public corporations and universities. Community residents refer to those who are group leaders, caregivers and volunteers in organizations such as NPOs, project committees, social welfare councils and consumers' cooperatives. When we look at who is a service provider, we find that private sector enterprises are service providers in 11 cases, public service entities are service providers in five cases and community residents are service providers in eight cases.

The selected service cases are listed in the Manual¹⁶ published by METI in 2011 with the consent of the respective service providers. Each project is introduced in a fixed format in which the service outline, service concept, results, opinions of both users and providers, ingenuity in role sharing, ingenuity in improving efficiency and service continuity, future development plans and contact details are described for each case.

3 Characteristics of each category

(1) Small bases

While each of the nine cases in the small base category has its own particular characteristics, "Y Shop" and "Local Coop Station," in particular, have much to offer from the perspectives of cooperation among multiple entities, possibility to develop in other regions and long-term continuity.

① Y Shop

In the island area in Kure, Hiroshima, JA (Japan Agricultural Cooperatives) Hiroshima Yutaka joined "Y Shop," which is a cooperative project between JA and a private sector company (Yamazaki Baking Co., Ltd.), as described in a report²⁵ written by Ryuichi Fukuda in 2010. In this area, the continued presence of JA stores was at stake because of a declining and aging population. In order to maintain their presence, these JA stores joined forces with "Y Shop," which is a voluntary chain. By becoming part of the Y Shop voluntary chain, JA was able to achieve the following features: (1) exhibiting leadership and maintaining autonomy, (2) acquiring a distribution network as well as expertise in store operations and (3) meeting the demands of users. As such, this project offers suggestions in terms of the possibility of developing service in other areas and long-term continuity.

First, with respect to (1) exhibiting leadership and maintaining autonomy, a JA leader exhibited strong leadership to gain the cooperation of all related parties and, at the same time, developed a concept for and designed stores on his own responsibility, realizing a

collaboration that had never existed previously. In addition, because a voluntary chain contract is less restrictive than a franchise chain contract, JA was free to design their own stores and was able to meet the demands of islanders and visitors precisely by offering a wide range of products such as agricultural production materials, fish and the island's special products.

Regarding the next point, (2) acquiring a distribution network as well as expertise in store operations, JA was able to quickly acquire a means of distribution and expertise in store operations, something that JA stores had not achieved in the past. For distribution, the powerful nationwide distribution network of Yamazaki Baking Co., Ltd., which consists of a fleet of trucks having three separate temperature-controlled compartments, has proved to be sufficiently effective even in the island area by improving efficiency such as the consolidation of delivery trucks. By introducing store operation expertise, which is similar to that for convenience stores, it was possible to offer a better assortment of products, as well as to improve the level of customer service skills and store clerk motivation. Because it is not necessary to provide the high level of service such as 24/7 operations that convenience stores must offer, the workload of store clerks is smaller, and the fixed operating costs that are paid to the chain headquarters is also smaller.

From the viewpoint of (3) meeting the demands of users, the JA branch manager acts as store manager and gives meaning to conversations between sales clerks, co-op subscribers and community residents so as to maintain a good relationship with them. These efforts have led to good performance of one of the stores such as being No. 1 in the prefecture and No. 11 in the country in terms of pre-orders for ehomaki rolls (sushi rolls associated with the setsubun festival), Christmas cakes, etc.

Through adopting this highly systemized approach, Y Shop is not merely keeping failing stores alive, but instead has increased its sales by 15 percent by improving service levels and attracting new customers.

② Local Coop Station

"Local Coop Station," offered by the Saitama Co-op, is a service that enables co-op subscribers to designate community stores as locations at which home delivery services can drop packages. Through this service, (1) community stores can act as small bases, (2) delivery efficiency is improved and (3) goods can be held temporarily for subscribers to the service if they are not home when the delivery truck attempts delivery. Regarding (1) community stores acting as bases, community residents gather at community stores where they receive co-op products and also buy goods at the stores. Therefore, there is interaction between residents at such community stores, which fulfill the functions of a small base as described in Table 3. Then, (2) improved delivery efficiency is achieved by delivering goods addressed to several subscribers to a single location (a community store)

rather than to their individual homes. In addition, (3) temporarily holding goods for subscribers is a safer service option than individual home deliveries for those who often tend to be away from their homes. In a sense, we can say that community stores provide the functions that were fulfilled by group leaders and caregivers in conventional co-op group supplies.

(2) Transportation of merchandise

Each of the eight cases of the transportation of merchandise has its own unique characteristics. From the viewpoints of the possibility of developing in other regions and long-term continuity, Hearts Delivery and Seven Meal offer many excellent ideas.

① Hearts Delivery

“Hearts Delivery” is a mobile grocery vending service by the Fukui Co-op, which was introduced by the report⁷ written by Yuichiro Ichinose in 2010. Because the co-op conducts a mobile grocery vending service, this service can provide the following features: (1) making use of existing stores and delivery networks, (2) meeting the demands of users and (3) achieving a balance between public benefit and profitability. Therefore, this project provides suggestions in terms of the possibility of developing service in other areas and long-term continuity.

Considering (1) making use of existing stores and delivery networks, the co-op uses the existing distribution networks that it has for non-store retailing, and its delivery trucks to pick up products from existing stores. In this way, the co-op was able to create efficient delivery routes in a short time. In addition, because the Hearts Delivery trucks are equipped with a point of sales (POS) system to share order and stock information with stores, there are basically no losses resulting from unsold stock.

Regarding (2) meeting the demands of users, the co-op has had a subscriber base in areas where group supplies were conducted in the past. Some of these subscribers volunteered to become caregivers to collect orders from subscribers living in their neighborhoods and to hold tea parties before or after the arrival of the delivery truck. In this way, community residents are grouped, thus strengthening the customer base. In addition, because everyone could participate in the process of selecting delivery stations, the degree of satisfaction among the residents is high and new friendships are being built among users who gather at the stations. Furthermore, experienced drivers who conducted group supplies in the past joined the project as the drivers of the delivery trucks. Therefore, they remember the faces of individual customers and offer a selection of products that are suitable for those customers. With such attentive customer service, customers feel a high degree of confidence.

In addition, on the subject of (3) achieving a balance between public benefit and profitability, a cooperative is, by definition, serving the public, and gives the impression of working for the public interest. Therefore, it was

easy to arrange public facilities such as community centers for use as delivery stations. If any other type of commercial enterprise were to attempt mobile grocery vending, there would be a possibility of people opposing the use of public spaces by profit-making enterprises. Cooperatives are very well placed in this regard. Furthermore, the needs of the users are not necessarily fulfilled at low prices. By offering a range of products that offer quality and freshness, the cooperative continues to be well patronized. When festivals and events are held in a district, the local co-op accepts pre-orders for appetizers, sashimi, sushi platters, etc., which increases the average amount of spending per customer.

Through this highly systematized approach, the Fukui Co-op considers mobile grocery vending as its third area of business after stores and non-store retailing (group supplies and home deliveries).

② Seven Meal

“Seven Meal” is designed to deliver nutritious meals from 7-Eleven stores to customers’ homes. The meals are delivered either by Yamato Transport home delivery service or, possibly, by the staff of the store. For this service, Seven-Eleven Japan makes full use of its technical expertise in developing and processing box lunches and daily dishes, its distribution network and store network, thus improving efficiency. At the same time, another feature of this service is that the convenience stores act as the small bases described in Item (1).

(3) Transportation of people

Similarly, each of the seven cases has its own special characteristics. The existing research literature in the transportation field, such as a book⁵ written by Tetsuo Akiyama et al. in 2009, covers the bus-type sub-category. This paper introduces “welfare fare-paying transportation in sparsely populated areas” as a project falling under the taxi-type sub-category, which faces strict conditions for realization but for which there are high expectations.

Sai Village, Aomori Prefecture, which faces the Tsugaru Channel, is a depopulated village where residents are unable to return home on the same day by fixed-route bus service, even from the relatively near Mutsu City, except for those from the central areas of the village. “Welfare fare-paying transportation in sparsely populated areas,” which was also reported in the cases¹¹ published by the Transport Planning Division, Policy Bureau, Ministry of Land, Infrastructure and Transport (2008), is offered by the Social Welfare Council of Sai Village. Pursuant to Article 79 of the Road Transportation Law, this shared fare-paying transport service uses personal cars, with volunteers as drivers.

The service is provided in areas where it would be difficult even for a shared taxi service to make a profit. Community residents themselves provide business resources (vehicles and drivers) and collect fees to

ensure service continuity. This service can be considered as an extension of being transported by one’s family, relatives or friends, with the local community stepping in to do so by charging fees. However, because it is a time-sharing arrangement that uses the resources of community residents based on mutual trust, it does not lend itself to long distances or journeys. In the case of Sai Village, the service is also used to take people from their homes to the nearest bus stop. Therefore, in order to ensure continuous service, an effective combination with small bases, mobile grocery vending and buses would be necessary, rather than providing “welfare fare-paying transportation in sparsely populated areas” alone.

IV Required Activities to Enable Continuous Cooperation

1 Policies for identifying required activities based on the steps of service creation

We have identified the activities, albeit not comprehensively, needed to enable continuous cooperation among residents, businesses and the national and local governments at low cost for each step involved in the creation of services. That is, as shown in Figure 4, they are, through the creation of a map of people with limited access to shopping facilities: (1) quantitatively and visually understanding user needs and making use of unused facilities; (2) building an efficient operation platform and (3) launching and continuing service through cooperation among multiple entities in different sectors, including residents.

To enable “(1) quantitatively and visually understanding user needs,” expectations are given to the roles played by the local governments. For “(2) building an efficient operation platform,” tangible and intangible business resources that private sector enterprises have will be effective. Finally, “(3) launching and continuing service through cooperation among multiple entities in different sectors” implies that community residents and the national and local governments should join forces with service providers to support services.

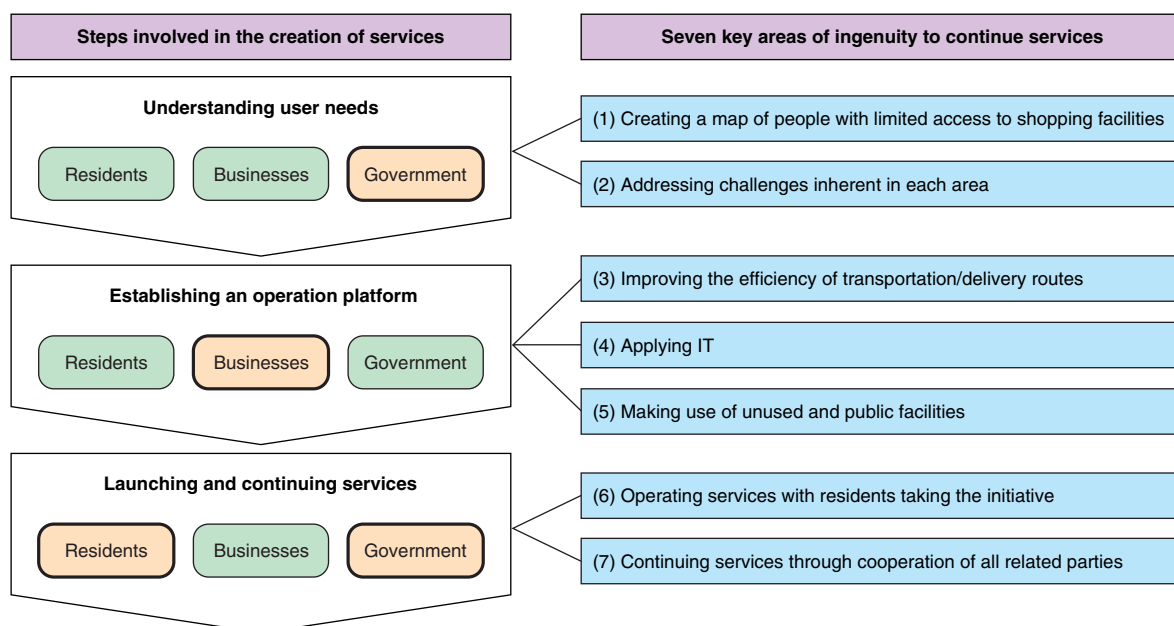
2 Quantitatively and visually understanding user needs

(1) Creating a map of people with limited access to shopping facilities

The use of a geographic information system (GIS) to quantify and visualize the locations of people with limited access to shopping facilities who live in food deserts is described in Araki (2007)⁶, Iwama (2010)⁸ and Komaki (2010)¹⁴ in detail. The Manual¹⁶ published by METI in 2011 presents a method to create a “map of people with limited access to shopping facilities” relatively easily even if the local municipality, the chamber of commerce and industry or residents are not necessarily equipped with high GIS literacy, and introduces a case in Sayo Town, Hyogo.

Putting aside whether GIS is used, it is essential to quantitatively and visually identify the locations and number of people with limited access to shopping facilities in order to provide services supporting such people. If this information is not available, it is not possible to make appropriate decisions as to the location of a small base, stations and routes for mobile grocery vending and community buses.

Figure 4. Steps involved in and ingenuity in the creation of services



(2) Addressing challenges inherent in each area

When people talk about services supporting people with limited access to shopping facilities, they tend to think of hilly and mountainous areas. However, such people are also found in large, skyscraper-lined cities and urban areas as well as in the suburbs that are filled with housing complexes. Accordingly, efforts must be made in line with the characteristics of each region.

For example, while many commercial facilities are located in large cities and urban areas, there are also districts in urban areas where it is difficult to buy perishables. In such districts, the needs for perishables should be met by mini supermarkets or convenience stores that handle perishables.

In the suburbs, stores located on the first floor in the common space of apartment complexes that are more than 30 years old were closed, and residents living there are aging. Going up and down stairs to and from high floors is not merely inconvenient; it is dangerous for aged people. In such districts, there are examples where organizations such as residents' associations or apartment management associations sell groceries in the common space of the first floor, temporarily hold packages delivered to residents, and deliver packages to residents living on high floors.

In the central cities of rural areas, rural cities, the suburbs of rural cities, etc., stores are located some distance away. However, in some cases, stores located along the main roads of the suburbs do not correspond with the bus routes that mostly operate between railway stations. In these districts, the reorganization of a bus-type transportation network such as introducing community buses and shuttle buses operated by retailers could be effective.

In the hilly and mountainous regions, it is considered necessary to effectively combine some of the categories and sub-categories described in Section 3 (Study of Service Cases), which are small bases, mobile grocery vending, home delivery and a taxi-type transportation network.

3 Building an efficient operations platform

(1) Improving the efficiency of transportation/delivery routes

For the transportation of both merchandise and people, it is necessary to establish efficient routes to ensure business continuity. It is not realistic to expect retailers serving a trade area having a radius of 20 km to deliver goods unaided to all individual customers living within that area. Conversely, it is unlikely that all individuals with limited access to shopping facilities who live 20 km away will visit stores by taxi. As described in Section 3 (1) (Classification of services), small bases should act as nodes for transshipment and transfer. Through adopting a layered network structure by separating a main distribution network from local delivery networks, the operation schedules for these networks

should be synchronized. As a result, service can be continued without significantly compromising both operation efficiency and level of service. For example, Yamato Transport Co., Ltd. adopts the layered network structure for its nationwide distribution network covering all individual households. Yamato employs both a bus stop method (for areas having a radius of about 400 m or more) that uses delivery trucks and hand trucks (used between delivery truck stations and individual homes) and a method using bicycles with trailers (for areas having a radius of less than 400 m) that delivers goods from a satellite center. In this case, delivery truck stations and satellite centers fulfill part of the functions of small bases.

Table 5 lists and outlines the cases that are discussed in this paper. With small bases acting as nodes, the sharing of distribution functions between businesses and consumers can be seen in a variety of formats (for example, as indicated in Yahagi (1994, pp. 47-48)²⁹).

(2) Applying IT

For small- and medium-sized enterprises, their associations and community residents, the use of IT to improve the efficiency of distribution is not necessarily easy from the perspectives of both human resources and funding. Possible options that enable the improvement of efficiency in a short time and with limited initial investment include the use of SaaS/ASP-type services provided by large retailers and joining a voluntary chain, etc. For example, Yamato Transport and EveryD.Com offer an online "Net super" retailing and home delivery support service principally for medium-scale retailers. In addition, the case of JA joining the Y Shop voluntary chain attains similar effects.

Besides improved business efficiency, it is also possible to use IT for issuing orders and making user payments. However, some problems must be solved in order to promote the spread of IT use. Elderly people with limited access to shopping facilities have difficulty with online sales using PCs and mobile phones. Even with a large touch screen terminal, these people need repeated assistance in operating the terminal. In addition, a different operating screen for each service is likely to hinder the diffusion of services. With the spread of tablet PCs, it has become possible to use the Internet to issue orders and make payments at lower costs and with lower psychological stress than before. In the future, common operating screens having large icons that are easy for seniors to understand and operate should be developed. In addition, expectation can be given to the use of handy terminals carried by home delivery drivers to receive orders face-to-face.

(3) Using unused or public facilities

Because people who face limited access to shopping facilities mostly come into view as a result of the closing down of nearby stores and the discontinuance of bus

Table 5. Cases of role sharing between a main transportation network and local delivery networks with small bases acting as nodes

Case	Node (small base)	Main transportation network	Local delivery networks
Y Shop: JACK Osaki, Yamazaki	Y Shop	Truck delivery by Yamazaki Baking Co., Ltd.	Walking by users
Local Coop Station	Community stores	Truck delivery by Co-op	Walking by users
Hearts Delivery	Stations	Co-op's mobile grocery vending	Walking by users
Seven Meal	Seven-Eleven stores	Truck delivery by Seven-Eleven	Delivery by store staff or by Yamato Transport
Welfare fare-paying transportation in sparsely populated areas	Not fixed (bus stops, clinics, etc.)	Fixed route buses	Volunteers' own cars
Reference: Fixed route bus	Bus stops	Fixed route buses	Walking by users
Reference: Shopping center	None	Users' own cars (role sharing not involved)	Users' own cars (role sharing not involved)
Reference: Convenience store	Convenience store	Truck delivery by convenience stores	Walking by users
Reference: Co-op group supplies	Home of group leader or caregiver	Truck delivery by Co-op	Walking by users

routes, possible solutions include the use of unused stores and idle vehicles (buses, trucks, etc.) at low costs in the districts where there are many such people. It is also possible to use facilities owned by municipalities, community centers and chambers of commerce and industry as small bases. The use of community centers by profit-making enterprises was strictly restricted in the past. However, with the Notice²⁸ of the Director General, Lifelong Learning Bureau, Ministry of Education, Culture, Sports, Science and Technology (1995), it is now possible for profit-making enterprises to use such centers for purposes in the public interest under prescribed conditions. Moreover, by reorganizing private transportation networks such as shopping shuttle buses, school buses and patient transportation buses or by permitting the use of such buses by those other than the originally intended users, both the vehicle operation rate and the level of user convenience can be increased.

4 Launching and continuing services through cooperation among multiple entities in different sectors

(1) Organizing community residents

People with limited access to shopping facilities are considered different from urban consumers who follow the pleasure principle (Tamura (2001, pp.161-166)²⁰). Rather, in the same way as was done in conventional co-op group supplies, although the social background is different from that in the past, if community people are grouped and are willing to take on part of the distribution functions such as issuing orders, temporarily holding packages, making deliveries to individual homes and transporting people to and from their destinations, the possibility of service continuity will increase. This is true even for services that are difficult for private sector

enterprises to continue alone. For example, in the case of the Shonai Town Development Cooperative Association, "Niji," six organizations such as associations and social welfare corporations joined forces to establish a joint undertaking covering a wide range of fields such as supplying food, transporting people to and from their destinations, pharmacies, medical services, insurance and nursing care. Through these activities, Niji is promoting the resident-led development of the town.

(2) Improving profitability

It is essential to ensure a certain level of profitability in order to continue service for a long time. It is not realistic to expect government subsidies to continue for a long time to make up for losses. In addition, dependence on subsidies might dampen service providers' enthusiasm to improve business performance. Similarly, it is difficult to maintain the motivation of volunteers who receive little or no remuneration for a long time. They are prone to collapse due to overwork.

Based on the existing service cases, Table 6 outlines suggestions for improving profitability by dividing them into those for increasing sales and reducing expenses. However, it should be noted that the cases listed in this table are not necessarily all-inclusive.

① Increasing sales

Contributors to increased sales include increasing the number of users, the average amount of spending per user, use frequencies (repeat rate) and non-operating income.

In order to increase the number of users, service providers must establish small bases and stations based on user needs that are identified quantitatively and visually. The government can cooperate in understanding these needs by conducting surveys on the awareness of

Table 6. Suggestions for improving profitability

Revenue and expense	Change element	Service provider	Community residents	Government
Increasing sales	Increase in the number of users	<ul style="list-style-type: none"> • Setting up bases and stations based on user needs identified quantitatively and visually • Building and maintaining trust among community residents • Providing a selection of products designed to meet user needs (agricultural production materials, fresh fish, special products, etc.) 	<ul style="list-style-type: none"> • Expressing one's own needs • Encouraging acquaintances and neighbors to use the service • Organizing community residents 	<ul style="list-style-type: none"> • Conducting a survey on the awareness of residents to support the efforts to quantitatively and visually identify user needs • Providing public notices because stable food supplies constitute part of social infrastructure that must be secured by the government
	Increase in the average amount each customer spends	<ul style="list-style-type: none"> • Refraining from discounts • Providing a selection of high-price products that meet user needs (high-class fish, brand-name Japanese beef, etc.) • Receiving pre-orders for seasonal products, etc. 	<ul style="list-style-type: none"> • Being receptive to high prices 	<ul style="list-style-type: none"> • Issuing coupons, etc. (excessive aid is not recommended)
	Increase in frequency of use (repeat rate)	<ul style="list-style-type: none"> • Introducing operation expertise (customer service skills, etc.) such as that possessed by a voluntary chain, etc. • Building and maintaining trust among community residents 	<ul style="list-style-type: none"> • Organizing community residents; introducing a membership system • Regularly taking orders 	
	Increase in non-operating income	<ul style="list-style-type: none"> • Advertising revenue from local companies, donations, etc. 	<ul style="list-style-type: none"> • Membership fees • Purchasing a book of coupons 	<ul style="list-style-type: none"> • Grants, subsidies, etc. (dependence on subsidies is not recommended)
Reducing expenses	Cutting the cost of goods sold	<ul style="list-style-type: none"> • Using existing stocking and distribution networks owned by large retailers, etc. • Adopting a pre-order system to eliminate losses resulting from unsold groceries • Sharing inventory information among stores and mobile vending trucks to eliminate losses resulting from unsold groceries 	<ul style="list-style-type: none"> • Accepting a pre-order system 	<ul style="list-style-type: none"> • Providing coordination for joint stocking
	Cutting operating costs	<ul style="list-style-type: none"> • Using existing distribution networks, store networks and IT infrastructure that are owned by large retailers, etc. • Adopting a layered structure for operation routes, synchronizing operation schedules • Using unused facilities and unused vehicles • Maintaining a moderately appropriate level of service (avoiding an excessively high level of service) • Shifting from home deliveries to deliveries to small bases • Holding goods temporarily at community stores, etc. • Picking up goods at stores (for home deliveries, mobile vending) 	<ul style="list-style-type: none"> • Accepting a moderately appropriate level of service (not demanding an excessively high level of service) • Offering private land as a station • Offering or using the common space of apartment complexes • Fulfilling part of the distribution functions (packages are temporarily held at a caregiver's home; packages are received at a small base; community residents take people to and from small bases by car) 	<ul style="list-style-type: none"> • Reorganizing public bus routes (including school buses and welfare buses) • Permitting mobile vending at public facilities, community centers, parks and public housing • Easing regulations concerning parking by mobile vending trucks • Offering government facilities and vehicles • Temporarily holding packages at public facilities and community centers • Easing regulations concerning home deliveries by taxis • Using post offices as small bases • Grants, subsidies, etc. (dependence on subsidies is not recommended)

residents. It is also considered effective for residents themselves to actively express their needs. By drawing on the public nature of cooperatives and gaining the understanding of and cooperation from municipalities, trust can be built and maintained between service providers and community residents. With community residents encouraging one another to use services, from the mid-term perspective, community residents should be organized so as to increase the level of continuity. Moreover, without relying on the public nature, service providers should provide a selection of products

designed to meet user needs (such as agricultural production materials in the case of Y Shop), thereby acting to attract customers.

For the purpose of increasing the average amount of spending per user, service providers should refrain from offering discounts. At the same time, community residents themselves should be receptive to higher prices if they can be justified. However, rather than simply charging higher prices, what is important here is that service providers achieve a high degree of satisfaction by providing high-quality products that meet user needs and

that justify higher prices. One possible option could be the issuance of subsidy coupons by the government. However, we do not recommend excessive subsidies.

To increase use frequencies (repeat rate), service providers should build and maintain trust among community residents by leveraging the public nature and customer service skills. At the same time, it would be effective for community residents to cooperate in regularly collecting orders by organizing themselves or establishing a membership system.

A means of increasing non-operating income is not limited to gaining revenue from advertising for other businesses in the same community. Other means such as the payment of membership fees or the purchase of books of coupons by residents are also worth studying. However, again, dependence on grants, subsidies, etc. is not recommended.

② Reducing expenses

Reductions in the cost of goods sold and in operating expenses can contribute to a reduction in overall expenses.

Major contributors to cutting the cost of goods sold include the use of existing stocking and delivery networks owned by large retailers and the elimination of losses resulting from product disposal. Effective measures to eliminate losses stemming from unsold goods would include receiving pre-orders from users and the sharing of inventory information among stores and mobile vending trucks, etc. In this case, service continuity would be increased if community residents readily accept a system of pre-orders.

In order to reduce operating expenses, possible measures that can be adopted by service providers alone to improve efficiency would include the use of the existing distribution networks, store networks and IT infrastructure that are owned by large retailers; the development of a layered network structure for operation routes (separating the main distribution network from local delivery networks) and the synchronization of operation schedules of the main distribution network with local delivery networks. If service providers, community residents and the government join forces in providing existing resources, available resources such as unused stores, unused vehicles, private land, common spaces in apartment complexes, public facilities, community centers, parks, public housing and vehicles owned by local governments can all be used effectively. The effective use of these resources will contribute to reductions in rent and depreciation expense. Furthermore, if distribution functions are shared by businesses and community residents—for example, if packages are received collectively and are held temporarily at a caregiver's home or a Local Coop Station, if residents transport people to and from stores and if residents make deliveries to individual homes—services that are difficult for private sector enterprises alone to continue will become sustain-

able. In sharing the roles, community residents should accept a moderately appropriate level of service and should not expect businesses to provide excessively high levels of service. Such consideration would help businesses control their costs, which will eventually contribute to lowering prices for products and services. The government is also expected to take part in the efforts to ensure service continuity. Specific governmental actions include reorganizing public bus routes including school buses and welfare buses, permitting mobile grocery vending and parking on public land, collectively receiving and temporarily holding packages at public facilities and deregulating home deliveries by taxis. Here, again, reliance on grants, subsidies, etc. is not recommended.

V Suggestions for Continuous Cooperation and Challenges to Address

1 Suggestions for continuous cooperation

The suggestions derived from this research are as follows:

- 1) Setting up small bases
- 2) Rebuilding distribution and transportation networks
- 3) Sharing distribution functions among businesses, the government and residents
- 4) Sharing business resources
- 5) Establishing a balance between public benefit and profitability

Regarding Item 1), setting up small bases, JA stores (for example, Y Shop), community stores, convenience stores, mobile vending stations, bus stops and caregivers' homes serve as small bases, and these bases are equipped with a variety of distribution functions. The common element in the cases introduced in this paper is the effective use of existing facilities as small bases.

As described in III-1, classification of services, and IV-3(1), improving the efficiency of transportation/delivery routes, Item 2), rebuilding distribution and transportation networks, refers to measures that use small bases as network nodes to maintain a level of service that is offered by local delivery networks without diminishing the efficiency of the main transportation network.

In rebuilding these networks, distribution functions should be shared among businesses, the government and residents (Item 3)). In the case of Local Coop Station, operated by Saitama Co-op, community stores assume the role of receiving and holding packages, and users bring packages from community stores to their homes. This format is similar to that adopted by group supplies in the past in which a caregiver issued orders, received

goods and temporarily held them, and each user brought his or her goods from a caregiver's home to his or her own home. Similar role sharing took place spontaneously in Hearts Delivery in which a caregiver issues orders and temporarily holds goods. The case of "welfare fare-paying transportation in sparsely populated areas" is a pioneering project involving the passenger transportation function assumed by community residents. A suitable combination of this project with other services is expected to increase continuity. The case seen in food home delivery services such as that in which orders are placed one week before delivery can be considered that users assume the function of demand forecast.

When roles are shared, business resources are also shared (Item 4)). Tangible resources include land, buildings, vehicles and human resources. Intangible resources include distribution networks, operation expertise and IT. The cases of Y Shop, Local Coop Station and "welfare fare-paying transportation in sparsely populated areas" are cases in which related entities mutually share business resources. Hearts Delivery and Seven Meal are cases that successfully use existing business resources for new services within the same company.

The last, but most important suggestion for continuous cooperation is the establishment of a balance between public benefit and profitability (Item 5)). A service that supports people with limited access to shopping facilities is difficult to continue if it is either one hundred percent public service or one hundred percent profit making. While the public nature of a service that maintains residents' healthy eating habits should be emphasized in building and maintaining trust among a wide range of related parties, it is equally or more important for service providers in the capacity of profit-making enterprises to provide high value-added services efficiently so as to gain user satisfaction. The cases of Y Shop, Local Coop Station and Hearts Delivery are noteworthy in that a balance between public benefit and profitability is achieved.

We believe that our suggestions in these five fields will enable the development of service models that were established through cooperation involving multiple entities including private sector enterprises, community residents and the government to other areas, and will contribute to ensuring continuous cooperation over a long time.

2 Challenges to address to attain continuous cooperation

The suggestions that we derived from our research are not yet all-inclusive or do not yet reach a necessary and satisfactory level. Furthermore, they are not quantitatively verified based on concrete data.

We regard this study as introductory research that provides suggestions for establishing more specific research

hypotheses concerning the continuity of services that support people with limited access to shopping facilities. For example, it would be meaningful to create quantitative models that apply a network structure with small bases serving as nodes or relay points, specify shared distribution functions and ensure profitability. It would also be significant to compare multiple cases quantitatively based on these models. Furthermore, by creating simulation models that include user behavior, it would be scientifically useful to examine the appropriateness of the sharing of distribution functions and identify the point of demarcation at which the utility function becomes indifferent.

The issue of people with limited access to shopping facilities heralds the appearance of a new retail industry or a new type of role sharing in distribution functions. At the same time, it presents new research themes for marketing, distribution and supply chain theories. We hope to see future progress in research relating to people with limited access to shopping facilities.

Note:

This research paper is based on the results of a survey conducted at the request of the Commerce and Information Policy Bureau, Ministry of Economy, Trade and Industry.

References:

- 1 Beaumont, J., Lang, T., Leather, S. and Mucklow, C. (1995), Report from the Policy Sub-group to the Nutrition Task Force: Low Income Project Team, Institute of Grocery Distribution.
- 2 Sharkey, J. R., Horel, S. (2008), "Neighborhood Socio-economic Deprivation and Minority Composition Are Associated with Better Potential Spatial Access to the Ground-Truthed Food Environment in a Large Rural Area," *The Journal of Nutrition*, Vol. 138, pp. 620-627.
- 3 Whitehead, M. (1998), "Food Deserts: What's in a Name," *Health Education Journal*, Vol. 57, pp. 189-190.
- 4 Wrigley (2002a), "'Food Deserts' in British Cities: Policy Context and Research Priorities," Vol. 39, No. 11, pp. 2029-2040.
- 5 Akiyama, T., Yoshida, I., Inoi, H. and Takeuchi, R. (2009), *Seikatsu shien no chiiki kokyo kotsu* (Local Public Transportation for Life Support), 2009, Gakugei Shuppansha.
- 6 Araki, H., Takahashi, M., Goto, T., Ikeda, M., Iwama, N., Iga, M., Tatemi, J. and Ikeguchi, A. (2007), "New Theoretical Trends in Food Geography and the Perspective on Japan," *E-journal GEO*, Vol. 2, No. 1, pp. 43-59.
- 7 Ichinose, Y. (2010), "Joken furi chiiki no kaimono nanmin to kyodo kumiai (People with Limited Access to Shopping Facilities in Areas with Disadvantageous Conditions)," *The Norin Kinyu*, Vol. 47, No. 11, pp. 644-659.
- 8 Iwama, N. (2010), "Food deserts mondai no genjo to taisakuan (Current Status of the Issue of Food Deserts and Proposed Countermeasures)," 1st Food Access Seminar, Policy Research Institute, Ministry of Agriculture, Forestry and Fisheries.

- 9 Uehara, Y. (1999), *Marketing senryaku ron* (The Theory of Marketing Strategy), Yuhikaku Publishing Co., Ltd.
- 10 Passenger Transport Division, Road Transport Bureau, Ministry of Land, Infrastructure and Transport (2009), *Chiiki kokyo kotsu zukuri handbook* (Handbook for the Development of Local Public Transportation). <http://www.mlit.go.jp/common/000036945.pdf>
- 11 Transport Planning Division, Policy Bureau, Ministry of Land, Infrastructure and Transport (2008), "Chiiki kokyo kotsu no kasseika saisei heno jireishu (Examples of the Revitalization and Rejuvenation of Local Public Transportation)." <http://www.mlit.go.jp/sogoseisaku/transport/jireiindex.html>
- 12 Urban Transportation Planning Office, City Planning Division, City and Regional Development Bureau, Ministry of Land, Infrastructure and Transport (2008), "The 4th Nationwide Person Trip Survey." http://www.mlit.go.jp/crd/tosiko/zpt/pdf/h17zenkokupt_panf2.pdf
- 13 Study Committee on Community Issues, Policy Group, National Land Development Council (2008), "Shuraku kadai kento iinkai chukan torimatome "Interim Report of the Study Committee on Community Issues."
- 14 Komaki, N. (2007), "Nihon ni okeru food deserts mondai no jisho kenkyu (Empirical Research on the Issue of Food Deserts in Japan)," Research Abstracts on Spatial Information Science.
- 15 Komaki, N. (2010), "A comparative of food desert maps of local cities in Japan," *Proceedings of GIS Association of Japan*, Vol. 19.
- 16 Ministry of Economy, Trade and Industry (2011), "Shopping Accessibility Aid Manual."
- 17 Study Group on the Role of Convenience Stores as Social Infrastructure, Ministry of Economy, Trade and Industry (2009), "Kyoso to kyodo no naka de shakai to tomoni shinka suru konbini (Convenience Stores Developing with Changes in the Social Environment under Competition and Collaboration)."
- 18 Sugita, S., *Kaimono nanmin* (People with Limited Access to Shopping Facilities), Otsuki Shoten.
- 19 Statistics Bureau, Ministry of Internal Affairs and Communications (2011), "Population Estimates 2011." <http://www.stat.go.jp/english/data/jinsui/index.htm>
- 20 Tamura, M. (2001), *Ryutsu genri* (the Principle of Logistics), Chikura Publishing.
- 21 Study Group on the Role of Distribution Systems in Community Infrastructure, Ministry of Economy, Trade and Industry (2010), "Report of the Study Group on the Role of Distribution Systems in Community Infrastructure."
- 22 Director General for Policies on Cohesive Society, Cabinet Office, Government of Japan (2011), "Koreisha no jutaku to seikatsu kankyo ni kansuru ishikichosa kekka (Results of Survey on the Awareness of Elderly People on Residential and Living Environment)."
- 23 Habu, K., Kato, H., Mihoshi, A. and Nitta, Y. (1992), "Aging Effects on Mobility in Habikino City," *Proceedings of Infrastructure Planning*, Vol. 15, No. 2, pp. 33-38.
- 24 Hino, K. (2002), "Connection between Inconvenience for Shopping and Eating Habits of Old People," *Journal of Architecture and Planning*, Vol. 556, pp. 235-239.
- 25 Fukuda, R. (2010), "Mikan to lemon no shima no Y shop (Y Shop in the Island of Oranges and Lemons)," *Chosa to Joho*, Nourinchukin Research Institute Co., Ltd., Vol. 20, pp. 20-21.
- 26 Mihoshi, A. (1991), "Eikoku National Travel Survey (NTS) ni okeru "kotsu konnansha" chosa to karei bunseki (UKÅfs National Travel Survey (NTS) on mobility difficulties and aging analysis)," *Proceedings of Infrastructure Planning*, Vol. 14, No. 2, pp. 75-79.
- 27 Mihoshi, A. and Nitta, Y. (1997), "Kotsu konnansha no gainen to kotsu juyo ni tsuite (Concept of People with Mobility Difficulties and Demand for Transportation)," *Journal of the Japan Society of Civil Engineers*, Vol. 518, No. 28, pp. 31-42.
- 28 Notice of the Director General, Lifelong Learning Bureau, Ministry of Education, Culture, Sports, Science and Technology (1995), "Shakai kyoiku ho ni okeru minkan eiri shakai kyoiku jigyoisha ni kansuru kaishaku ni tsuite (Interpretation of Private-Sector Profit-Making Social Education Businesses under the Social Education Act)." http://www.mext.go.jp/b_menu/hakusho/nc/t19950922001/t19950922001.html
- 29 Yahagi, T. (1994), *Convenience Store System no kakushinsei* (Innovative Convenience Store System), Nikkei Inc.
- 30 Yano, Y. (2011), "Ryutsu gyo ga seikatsu infra to shite hatasu yakuwari (Role of Distribution Business as Life Infrastructure)," *Journal of Marketing and Distribution*, No. 491, pp. 14-21.

Ken-ichi KUDO is a consultant at NRI's ICT and Media Industry Consulting Department. His specialties include supply chain systems and medical information.

Atsushi KIMURA is a group manager at NRI's ICT and Media Industry Consulting Department. His specialties include business reform and social system innovation by IT and the planning and operation of field tests.

Hiroyuki NOZAKI is a senior consultant at NRI's Social Systems Consulting Department. His specialties include risk management and risk finance.

Kazumasa UEDA is the executive assistant to the Cabinet Public Relations Secretary, Prime Minister's Office. Formerly, he was the assistant director, Commerce and Information Policy Bureau, Ministry of Economy, Trade and Industry, with responsibility for local commerce policies, etc.

As a leading think tank and system integrator in Japan, Nomura Research Institute is opening new perspectives for the social paradigm by creating intellectual property for the benefit of all industries. NRI's services cover both public and private sectors around the world through knowledge creation and integration in the three creative spheres: "Research and Consulting," "Knowledge Solutions" and "Systems Solutions."

The world economy is facing thorough structural changes led by the dramatic growth of IT industries and the rapid expansion of worldwide Internet usage—the challenges of which require new concepts and improvement of current systems. NRI devotes all its efforts to equipping its clients with business strategies for success by providing the best in knowledge resources and solutions.

NRI Papers present selected works of NRI Group's 7,000 professionals through its worldwide research network. The mission of *NRI Papers* is to contribute new ideas and insights into business management and future policy planning, which are indispensable for overcoming obstacles to the structural changes in our society.

All copyrights to *NRI Papers* are reserved by NRI. No part of this publication may be reproduced in any form without the prior written consent of NRI.

Inquiries to: Corporate Communications Department
Nomura Research Institute, Ltd.
E-mail: nri-papers@nri.co.jp