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AN EMPIRICAL STUDY ON SUSTAINABLE FORMATION OF LOCAL PUBLIC TRANSPORT SYSTEMS BY PARTICIPATION OF COMMUNITY MEMBERS

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AN EMPIRICAL STUDY ON SUSTAINABLE FORMATION OF LOCAL PUBLIC TRANSPORT SYSTEMS BY PARTICIPATION OF COMMUNITY MEMBERS

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ABSTRACT

In Japan, residents and companies increasingly cooperate to provide local public transport services as a form of social capital. This study examines the solutions and obstacles of the organization process of community members in providing local public transport. A comprehensive framework for community members' participation in providing local public transport identifies four key roles: human resources, sharing operational costs, identifying the current situation, and exchanging opinions. As a result, 1) community participation in all four key roles is necessary to form and maintain community-provided local public transport, 2) community members must voluntarily participate by setting common objectives in accordance with regional demands, and 3) public assistance systems encourage a community-based approach to providing local public transport.

Keywords: Local Public Transport, Community, Residents Participation

INTRODUCTION

Ordinary Japanese public transport systems are operated by self-accounting systems of fare receipts from passengers. This scheme is difficult to continue because of a decline in passengers; therefore, public sectors in particular municipalities subsidize local public transport provides. However, from the municipalities' perspective on financial conditions, such subsidies are also unsustainable.

Recently, many Japanese communities' members have begun providing local public transport. Kato et al. (2009) investigates these local public transport systems and names them "bottom-up local public transport system." Bottom-up systems are founded on stakeholders' commitment to local public transport systems, such systems have proven effective in maintaining local public transport systems with cooperation among stakeholders.

However, most cases are unplanned and isolated, and some are disconnected from the existing public transport network and municipal policies of public transport. Therefore, a methodology for sustainable formation of local public transport systems by participation of community members is necessary.

This study examines the problems and solutions in the organizing process for community members' local public transport systems.

EXISTING RESEARCH

In Japan, few local public transport services are provided by community members, as the research review shows. Taniuchi et al. (2009) investigate a regional peculiarity related to resident participation in bus transport, using "the social capital" concept. They focus on securing funds and supplying bus services. Inoi et al. (2004) investigate the efficiency and significance of the community bus service managed by local residents. Deguchi et al. (2007) evaluate the planning processes for redeveloping bus services and establishing community bus systems in depopulated areas.

The United Kingdom, however, reports many experiences of community transport management and operation systems. In the United Kingdom, post 1980s, many unconventional transport services were studied (e.g. Nutley, 1988) Examples of unconventional transport services are community transport (voluntary minibus services operated by community members), Demand Responsive Transport (DRT; no fixed route and scheduled transport services, and car-sharing.

Reason for this, the deregulation of regional bus services in the United Kingdom. A voluntary bus service as called "Community Transport" was institutionalized by 1985 Transport Act.

"Community Transport" in the United Kingdom emphasizes the concept of social exclusion and mainly aims to provide transport service for the people lives in rural areas and for those who are mobility handicapped (e.g., Gillingwater, Sutton, 1995; Department for Transport and Greater Manchester Passenger Transport Executive, 2004). Besides there exists another association named as "Community Transport Association" (CTA) where all the relevant actors of "Community Transport" work as advisory for the voluntary groups (CTA, 2012).

Many studies examine community transport. For example, Bryman et al. (1992) discuss decision-making processes in community transport organizations. They reveal that the leadership approach of the community transport operators' key staff is of particular significance. Gray et al. (2006) study community transport in rural areas, focusing on the relationship between mobility, accessibility, social exclusion, social capital, and networks.

These unconventional transport services are now considered as Flexible Transport Services (FTS), where "flexible" takes diverse meanings that are route, vehicle, operator, passenger and payment (Brake et al., 2007).

FLEXIBILITY OF TRANSPORT SERVICE

From the perspective of management and operation, passenger transport service flexibility comprises of four dimensions (Figure 1). Management flexibility is defined by operators' goals, typically profit. However, unconventional flexible operators (including local authorities and community) do not have a profit motive, but rather focus on social inclusion and community and mutual help among neighbors.

Operational flexibility is defined by whether the route and schedule are fixed or demand responsibility.

Figure 1 depicts conventional, commercial transport services in the lower row. Typical commercially operated services include conventional route bus services with fixed routes and schedules as well as taxi services.
On the other hand, upper columns illustrate non-profitable bus services. In the United Kingdom, many FTS take the form of community transport services with DRT (row of right). But in Japan, many community transport services have a fixed route and schedule (row of left).

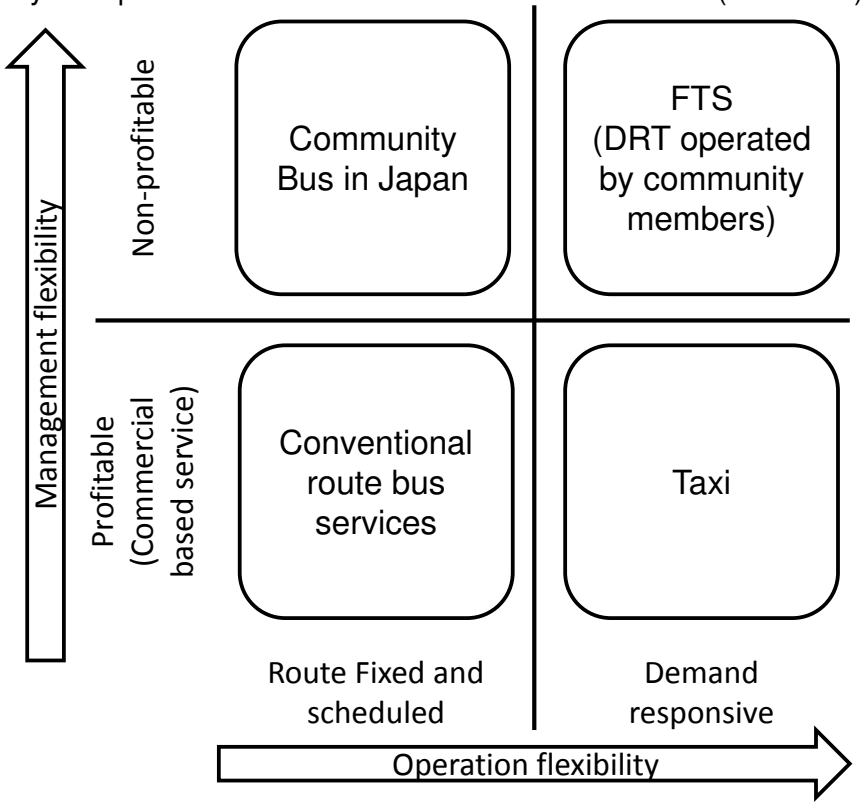

Figure 1 –Flexibility of Management and Operation

TYPES OF LOCAL PUBLIC TRANSPORT MANAGEMENT SYSTEMS

Classification of schemes

This study proposes a methodology for developing role sharing and participation by each community member's local public transport systems' activities. In this methodology, the three stages of local public transport systems' formation by participating community members are planning, management, and operation. The five stakeholders are municipality, public transport provider, commercial company, resident, and passenger. This study illustrates a framework for role sharing by these five stakeholders, which in turn defines four key roles: human resources, sharing operational costs, identifying the current situation, and exchanging opinions. This framework describes a method for community members' role sharing to provide local public transport systems (Table 1).

Table 1–Four key roles and their details

Key roles	Detail
Human resources	Planning: management and operational plan Management: Managing money, human resources, and vehicles, making a fleet plan Operation: fleet, fare collection, and service for passengers Support and backup
Sharing operational cost	Fare Not fare (donations)
Identifying the current situation	Recognizing current situations of local public transport Recognizing the presence of local public transport
Exchanging opinions	Constructive advice Egoistic opinion Complaint

Human resources means offering the human power needed to plan, manage, operate, and support local public transport systems. Sharing operational costs means bearing management and operating costs. Identifying the current situation means acknowledging the need of local public transport provision based on volunteers' awareness. Exchanging opinions means expressing stakeholders' opinions on local public transport service provision.
Types of role sharing are illustrated by Table 2 matrix, which identifies levels of role sharing among stakeholders in various local public transport systems. Each cells are filled by based upon investigation result of four key roles.

Table 2–Role sharing matrix

		Key roles			
		Human resources	Sharing operational costs	Identifying the current situation	Exchanging opinions
Stakeholders	Municipality				
	Public transport provider				
	Commercial company				
	Resident				
	Passenger				

Legend: ◎ contribute willingly, ○contribute, △ contribute in some cases

Classification of case studies

Table 3 summarizes case studies and results of classification using the matrix presented as Table 2 encompassing various management and operational systems. Each case is classified by the role sharing method as identified by an interview survey. As a result, there are five types of local public transport systems: 1) Led by a private bus operator, 2) Led by a municipality, 3) Led by a commercial company, 4) Led by a community, and 5) Hybrids (cooperation among residents, companies, the municipality, and private bus operators).

Table 3–Case studies

Type		Cases	Operating area	Management	Operation	Revenue other than fare
1) Led by a private bus operator	Ordinary bus management and operation scheme	Ordinary route bus	-	Private bus operator		-
		Ordinary route bus with subsidies	-	Private bus operator		Subsidies
2) Led by a municipality	Municipal bus	Municipal bus	-	Municipality	Private bus operator or Municipality	Subsidies
	Municipal bus with residents' participations	Suzunone Bus	Matsusaka city, Mie	Matsusaka city (Municipality)	Mie Kotsu (Private bus operator)	Subsidies and donations form commercial companies and individuals
		Takaoka Fureai Bus	Toyota city, Aichi	Toyota city(Municipality) and Fureai bus management association	Takaoka Fureai bus operation joint venture	Subsidies and burden charge from households(24,000 JPY/year)
		Kurobe-Higashi community bus	Kurobe/Higashi, Matsusaka city, Mie	Matsusaka city(Municipality) and Kurobe and Higashi residents association	Mie Meitetsu Taxi (Private bus operator)	Subsidies
3) Led by a commercial company	Managed by Shopping Center	Sunmarche loop bus	Kozoji NT, Kasugagi city, Aichi	Kozoji New town center development	Meitetsu Bus (Private bus operator)	donations form commercial companies
	Managed by companies' association	Odaka e-machi taxi (Demand Responsive Shared Taxi)	Odaka, Minami-souma city, Fukushima	Odaka machi commerce and industry association	Sanwa Shokai and Fuji Taxi (Private bus operator)	Subsidies
4) Led by a community	Managed and operated by community in rural areas	Mizuo community bus	Ukyo-ku, Kyoto city	Mizuo residents association		Subsidies and burden charge from households (1,000 JPY/month)
		Nagasawa mini bus	Nagasawa, Awaji city, Hyogo	Nagasawa mini bus operating association		Subsidies and burden charge from households (10,000 JPY/year)
	Managed by residents' association of New town	Danchi Kotsu bus	Mihama, Chiba city	Danchi Kotsu (private bus operator)		-
5) Hybrids (cooperation among residents, companies, the municipality, and private bus operators))		Seikatsu bus Yokkaichi	Hazu-Ikaruga, Yokkaichi city, Mie	Seikatsu bus Yokkaichi (Non-profit organization)	Mie Meitetsu Taxi (Private bus operator)	Subsidies and donations form commercial companies and individuals

1) Led by a private bus operator

A typical bus operation scheme led by a private bus operator provides bus service to passengers to obtain profit from fares. A private bus operator contributes human resources, while passengers contribute operational costs in the form of fare. (Table 4)

Table 4–Matrix of ordinary bus services

		Key roles			
		Human resources	Sharing operational costs	Identifying the current situation	Exchanging opinions
Stakeholders	Municipality				
	Public transport provider	◎			
	Commercial company				
	Resident				
	Passenger		◎		

If a commercial bus service runs a deficit, the bus route management system changes to the subsidized system. (Table 5)

Table 5–Matrix of ordinary bus services with subsidies

		Key roles			
		Human resources	Sharing operational costs	Identifying the current situation	Exchanging opinions
Stakeholders	Municipality		○		△
	Public transport provider	◎			
	Commercial company				
	Resident				
	Passenger		◎		

2) Led by a municipality

The municipality contributes human resources, sharing operational costs, and exchanging opinions. Examples include replacement bus service for abolished commercial routes by private bus operators and the municipal bus service (often called “Community bus” in Japan but operated and managed by the municipality, not by the community) that private bus operators never operated because it was unprofitable. (Table 6)

Table 6–Matrix of municipal bus services

		Key roles			
		Human resources	Sharing operational costs	Identifying the current situation	Exchanging opinions
Stakeholders	Municipality	○	◎		◎
	Public transport provider	○			
	Commercial company				
	Resident				△
	Passenger		○		

Recently, several municipalities have introduced a participation system. Matsusaka city, Mie introduced a bus called the “Suzunone bus,” for which commercial companies and individuals donate one-third of the operational costs. In this case, residents participate in public transport systems by sharing operational costs to maintain the service. Also Toyota city, Aichi introduced a scheme called the “Chi-iki bus”. Community members can form association for bus service. There are 12 services are introduced and managed by each community.

3) Led by a commercial company or multi-company association

The commercial sector contributes human resources and shares operational costs. This type of system leads fund-raising as their contribution by sharing operational costs. However, the bus fleet’s primary target is transport customers, and so the route and schedule sometimes do not match passengers’ needs.

This system has two characteristics: 1) managed by a shopping center and 2) managed by a multi-company association.

1) Managed by a shopping center: the shopping center provides bus services for their customers’ convenience, it covers operational costs and delegates operations to a private bus operator. (Table 7)

Table 7–Matrix of shopping center bus

		Key roles			
		Human resources	Sharing operational costs	Identifying the current situation	Exchanging opinions
Stakeholders	Municipality				
	Public transport provider	○			
	Commercial company	◎	◎		◎
	Resident				
	Passenger		△		

2) Managed by a multi-company association: this association provides regional bus services. Typically, a commerce and industry association provides bus services in cooperation with a municipality. The municipality contributes to sharing operational costs through subsidies and exchanging opinions through decisions on routes and schedules. (Table 8)

Table 8–Matrix of multi-company association bus

		Key roles			
		Human resources	Sharing operational costs	Identifying the current situation	Exchanging opinions
Stakeholders	Municipality	○	○		○
	Public transport provider	○			
	Commercial company	◎	◎		◎
	Resident				
	Passenger		○		

4) Led by a community

The local residents' association contributes to human resources through planning routes and schedules and to sharing operational costs by bearing the burden of expenses. Passengers, as direct beneficiaries of the public transport service, and residents, as indirect beneficiaries, cooperate to provide public transport service. Its characteristic is that residents exhibit a strong need for local public transport systems, thus, they are more willing to use services. However, residents' associations are sometimes financially weak.

The two types of this scheme are 1) managed and operated by the rural area community and 2) managed by the residents' association of a new town.

1) Managed and operated by the rural area community: The municipality supports human resources by negotiating with the control authority and sharing operational costs by providing subsidies. Typically, the rural area community collects the fares that its members pay for this exclusive voluntary transport service. However, some communities provide local public transport services when a strong community exists. (Table 9)

Table 9–Matrix of rural areas' community bus

		Key roles			
		Human resources	Sharing operational costs	Identifying the current situation	Exchanging opinions
Stakeholders	Municipality	○	◎		○
	Public transport provider				
	Commercial company				
	Resident	◎	○	○	○
	Passenger		○	○	

2) Managed by residents' association of a new town: A private bus operator works with residents to provide bus services. This occurs in new towns (e.g., housing complexes)

In cases of adequate demands but no adequate bus service provisions, newcomers contribute "human resources" to provide bus services.

5) Hybrid (cooperation among residents, companies, and private bus operators)

These cases do not assume municipality subsidy; instead, local residents, companies, and a private bus operator participate to manage and operate the public transport service. All stakeholders identify the current situation of the value of providing local public transport provision. Methodology and leadership are necessary to establish the local public transport providing association. Each stakeholder contributes to human resources and sharing operational costs through management, operation, support, and backup. Thus, all stakeholders derive significant benefits from the local public transport service. (Table 10)
However, the difficulties arising from participation inequity and/or sharing commitment among many stakeholders include the fear of "free ride" participants and the failure to ensure consistency with the existing public transport network. Stakeholders' interests must be coordinated, and this association must collaborate with existing bus network operators and the municipality to overcome these difficulties.

Table 10–Matrix of hybrid type

		Key roles			
		Human resources	Sharing operational costs	Identifying the current situation	Exchanging opinions
Stakeholders	Municipality	○	△	○	△
	Public transport provider	◎	△	◎	△
	Commercial company	○	◎	◎	○
	Resident	◎	◎	◎	◎
	Passenger		○	○	○

METHODOLOGY FOR PROMOTING RESIDENTS' PARTICIPATION IN LOCAL PUBLIC TRANSPORT PROVISION

Creating opportunities

The primary difficulty confronting residents' participation in local public transport systems is the lack of involvement opportunities for residents in local public transport. Many local public transport systems by community members in Japan arise without planning. For example, when they face a bus route abolishment they organize to address that problem. In such cases, the community association often initiates the organization process, having never before treated transport problems. However, it is difficult to organize an association of local residents for providing local public transport service without a strong existing community in urban areas and/or when conflicts of interest occur because residents in those situations have no opportunity to participate in resolving public transport problems.
An efficient solution is that the municipality creates opportunities to involve residents in local public transport. The municipality supports the residents association's efforts by ensuring

subsidies and contributing substantially to obtain consent from other residents and companies along the route.
However, if the municipality overly supports the residents association, the group may become too dependent on subsidies and discontinue its efforts.

Raising awareness and institutionalization

The formation of local public transport provision by community members' participation is more likely if municipalities provide opportunities for residents' involvement. However, residents require other structures to participate and continue their effort.
In Japan, the most common form of community transport service is an exclusive voluntary transport service for community members in rural areas. Public transport operations and management exceed the ability of volunteer activities alone because they require diverse tasks and considerable human resources. Thus, community transport systems seldom take the form of a public transport service, but rather an exclusive voluntary transport service.
If a particular individual heads activities for a community public transport provision and/or a particular sponsor bears the operational costs, it is danger of failing to provide public transport service. Therefore, such efforts succeed when they disperse the burdens of human resources and operational costs among participants who share roles and raise residents' awareness of local public transport provision. Sustainable local public transport provision by community members' participation can be achieved on the basis of all members' shared sense of the purpose of public transport. This process of institutionalization occurs more readily in rural areas because they have strong community associations and the residents generally share the same sense of their area's problems.

CONCLUSION

This study examined the formation of sustainable local public transport system managed and operated by community members' participation.
The proposed framework identifies four key roles: human resources, sharing operational costs, identifying the current situation, and exchanging opinions. Five stakeholders—municipality, public transport provider, commercial company, resident, and passenger—share these four key roles. This study describes a role sharing framework within which these five community-member stakeholders can provide a sustainable local public transport.
This framework identifies five types of local public transport systems, which are categorized by the appropriate allocation of stakeholder roles. However, it is difficult for community members to create a local public transport system because residents lack involvement opportunities for providing local public transport. Further, institutions must raise community members' awareness of public transportation needs so that they can share the sense of purpose for providing public transport. Such opportunities and frameworks are necessary to establish sustainable community transport provision.

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