Stakeholder Analysis in Carsharing Market in Urban Area: Evidence from the Tokyo Metropolitan Area, Japan

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Abstract. This paper surveys the characteristics of carsharing market in Japan and to withdraw the lessons from them particularly in terms of the cooperation among stakeholders in the market. Twenty-three individuals in ten organizations regarding the carsharing business were interviewed, including the carsharing operators, rail operators, bus operators, local governments, and central government. The results show that the stakeholders recognize two types of carsharing: the primary-mode-based system and the secondary-mode-based system; no carsharing operator has an idea to cooperate each other currently; the perceptions and expectation of carsharing operators are different from those of the national government; and the local governments have tried to introduce the carsharing system but suffer from the uncertainty regarding the effects of carsharing. Finally, the three potential cases where the cooperation is required among stakeholders in urban carsharing market are summarized: (1) the poor cooperation harms the benefit of carsharing users; (2) the poor coordination increases the external cost from transportation market; and (3) the poor coordination slows down the economic growth.

Keywords. carsharing, cooperation among stakeholders, interview survey, metropolitan area, Japan
INTRODUCTION
Carsharing market has been rapidly growing in many developed countries (1-6). Japan is also the case in which the number of carsharing users has kept increasing since 1998 (7). The most of carsharing service is provided by a number of private operators in Japan. The rapid growth of carsharing demand causes the tough competition among those operators. The tough competition is expected to improve the quality of service such as making the service charge lower and to strengthen the individual’s accessibility and mobility such as promoting the social inclinations. It may also contribute to the reduction of private car use and to result in the decrease of gas emission from automobile in total (8). However, on the other hand, it is afraid that too much competition among them may harm the accessibility and mobility of the urban travelers. For example, the competition among carsharing operators may reduce the compatibility between different carsharing services. The lack of integration between carsharing network and public transportation network may generate many barriers/seams in the transportation network. Thus some types of cooperation among the carsharing operators and/or between the carsharing operators and other stakeholders may be critical for the sustainable carsharing market. They include the service integration in ticketing system, the coordinated facility location planning between public transportation and carsharing, the quality partnership in carsharing service between carsharing operators and local governments, and the flexible membership strategy shared among the different carsharing operators. This paper aims to understand the characteristics of carsharing market in Japan by interviewing the stakeholders and to withdraw the lessons from them particularly in terms of the potential cooperation among the stakeholders. The study team composed of the authors interviewed twenty-three individuals in ten major organizations including the national government officials, the local government officials, the managers of the different types of carsharing operators, and the managers of the public transportation operators in the Tokyo Metropolitan Area. To the best of our knowledge, no study has reported the stakeholder opinions regarding the carsharing market in the context of Asia. The lessons in Japan may be also useful to other nations/regions where the carsharing market will emerge and grow in the near future.

The paper is organized as follows: first, the motivation and goals of this paper are presented. Next, the recent carsharing market in Japan will be quickly reviewed. Then, the method of stakeholder interviews and its results will be presented. The findings are summarized and implications are discussed in term of cooperation among stakeholders. Finally, the study is concluded with the future research issues.

CAR SHARING MARKET IN JAPAN
The general concept of having multiple users share a fleet of vehicles first emerged in Japan in the late 1990s (7). Honda (ICVS) and Toyota (Crayon) were the pioneering projects. However, they were the demonstration projects. Initial demonstration programs flourished during the period 1998 through 2002. Many of Japan’s initial shared-use vehicle systems used electric vehicles exclusively rather than conventionally powered vehicles. The first joint-venture carsharing system was established in February, 2002. ITS-CEV City Car system began as the government-sponsored MM21 (Minato-Mirai 21) demonstration project and has since been spun off as a separate company. The key shareholders for this company (CEV Co.) are Orix Rent-a-Car Corporation, Suzuki Motor Corporation, and NEC Corporation. Yokohama and Tokyo are the business areas. There were a total of 12 stations with 27 vehicles and approximately 550 members at the beginning. The primary target for this system was business use. Until 2007, CEV Co. expanded the business into 44 stations with 60 vehicles and about 1,000 members. In April 2007, CEV Co. was merged into Orix-Carsharing Co. Toyota also started the carsharing business in November 2007. After the deregulation of carsharing business in 2006, the carsharing market has been rapidly growing in Japan. New types of operators such as condominium owners, urban rail operators, and parking-place operators also started the carsharing service. Currently a number of carsharing operators give the carsharing services independently. Major carsharing operators include ORIX Auto Corporation, Park 24, and Car Sharing Japan Co., Ltd. TABLE 1 shows the vehicles and members of carsharing during 2003 to 2011 in Japan (9).

<table>
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<th>2002</th>
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<td>Vehicles</td>
<td>21</td>
<td>42</td>
<td>68</td>
<td>86</td>
<td>118</td>
<td>237</td>
<td>510</td>
<td>563</td>
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<td>Members</td>
<td>50</td>
<td>515</td>
<td>924</td>
<td>1,483</td>
<td>1,712</td>
<td>2,512</td>
<td>3,245</td>
<td>6,396</td>
<td>16,177</td>
<td>73,224</td>
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Source: Foundation for Promoting Personal Mobility and Ecological Transportation

There is no law/act directly regulating the carsharing in Japan. Carsharing business is regarded legally as one of the rent-a-car businesses. Rent-a-car business is regulated by the Road Transport Act and by the Garage Act under a supervision of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT). Section 79 of the Road Transport Act regulates that rent-a-car operators must apply for the permission from Local
Transport Bureau of MLIT to start the new business. Section 1 of the Government Ordinance of Garage Act also regulates that a rent-a-car station must be located within two kilometers from an office with staffs. “Official Notice on Rent-a-car” regulates that a car borrower is required to present or to submit a copy of driving license to the car leasing organization when leasing a car. This means that the staff(s) must always stay at the rent-a-car depots/stations. Then, the Restructuring Special Zone (RSZ) was introduced in April, 2003 when Mr. Junichiro Koizumi was the prime minister. The carsharing was also included as one of the policies in the framework of RSZ in 2004. Under this framework “Note on interpretation of Section 80 (2) of Road Transport Act in applying for the rent-a-car-based environmentally-friendly carsharing program under RSZ law” was issued by MLIT in 2004. This allows the car leasing service without face-to-face contact of customers and staffs. Rent-a-car-based carsharing is defined as “a business to lease a car to an individual belonging to a specific carsharing organization.” However, the one-way carsharing service is not allowed by the Garage Act. In 2006, the carsharing business was deregulated furthermore. After 2006, a new carsharing business can start if the following conditions are satisfied: environmentally-friendly automobiles are used and the real-time data collection system is introduced for carsharing service particularly using the Information Communication Technology (ICT) devices. Note that the key-box system is not permitted in this scheme. It should be also noted that the 2-km parking regulation is still active even now. However, in practice, when the ICT-based facilities at carsharing stations and ICT-based devices in a vehicle are installed, the carsharing service is regarded as if the carsharing stations were the offices with staffs. A local police agency evaluates whether this condition is satisfied or not. The one-way carsharing service is still not allowed even now.

**STAKEHOLDER INTERVIEWS ON CARSHARING IN JAPAN**

The study team including the authors interviewed the major stakeholders relating the carsharing market in Japan. First, the potential stakeholders are selected where a “stakeholder” is defined as a participant who can influence or be influenced by the corresponding transportation problem. To select the potential stakeholders, we first discuss the experts and academics on carsharing in Japan. Then, the potential stakeholders were sequentially interviewed in order to comprehend their problem perceptions. The interview consists of structured questions and open questions. The structured questions include the following three key questions:

- What is (are) your or your organization’s goal(s)?
- What is (are) the major constraint(s) disturbing your activities to reach the goal?
- What is (are) the possible cooperation with other stakeholders in terms of your business?

On an average, each interview took around two hours; after asking the structured questions, the interviewers requested the interviewees to freely respond about the current problems and future of the carsharing market in Japan. In most of the cases, two or three people were interviewed: most of these people were chief executives or officials responsible of managing their organizations. When an additional stakeholder is pointed out during the interviews, they are sequentially included in the list of interviewees. The details of the method used in the interviews follow the method presented by Kato et al. (10). Finally twenty-three individuals composed of the following ten organizations were interviewed: a rent-a-car-operation-based carsharing operator, a parking-space-operation-based carsharing operator, a gas-station-operation-based carsharing operator, an urban rail operator, a rent-a-car operator, an urban bus operator, the Department of Transport Planning in the MLIT, the Department of New Transport Service in the MLIT, a Prefectural Government, and a Ward Government. The interviews were carried out in July to August, 2010.

**Rent-a-car-operation-based carsharing operator**

This is the private company that has been operating the car leasing and rent-a-car businesses. The primary strategy of this company is to provide the cars to users. There are the two reasons for starting the carsharing business. The one is that they have suffered from the decline of the conventional business for years mainly because the car leasing demand of business customers has been decreasing due to the long economic recession. The other is that they want to capture the young customers in rent-a-car service or carsharing service because the car ownership of young people has been decreasing significantly in Japan. Their final goal is to develop an integrated car providing service combining the car leasing, rent-a-car service, and carsharing service. They consider that it is important to promote the individuals to change their mind from the car ownership to the smart car use through the multimodal transportation system and/or the modal shift from private car to public transportation incorporating the carsharing. They assume that the main effect of introducing the carsharing system is that the car users can reduce their direct cost, including the fuel cost, the car-ownership cost, and car-insurance cost. They also suppose that the carsharing users drive the cars less than private car users because they probably care about the transportation cost more seriously since the service charge is explicitly indicated to users during the carsharing drive.
They forecast that carsharing supply will grow into 50,000 cars in Japan. When it is assumed that one car is shared by fifty customers per year, about 2.5 million users may use the carsharing service annually. Although the demand is expected to grow, they have a supply-driven strategy to expand the carsharing users rather than the passive strategy to wait the future demand increase. Thus, they have been actively investing the carsharing stations all over the nation. Currently, they do not take an account of the integration or standardization of carsharing system with other carsharing operators. However, they are now examining the feasibility to cooperate the service with public transportation in order to supplement the public transportation network with the carsharing service. Although they regard the urban bus operators as one of their competitors in the urban transportation market, they feel there is a room for a negotiation with them to establish some partnership in order to achieve the sustainable urban transportation market. They have no idea to work together with an advertising agency but they may flexibly discuss the feasible option with them if the market size grows sufficiently. The main constraint of their business is the financial burden caused by the large investment of parking spaces. The investment cost of parking spaces is the largest component among the three major cost factors: vehicle cost, parking-space cost, and operating cost. Although they hope that the on-street parking space is available for carsharing business, the Japanese regulation does not satisfy their hope. Although they understand the importance of introducing the electric vehicles (EVs) to contribute to the global environmental issue, the recharging devices for the EVs are too costly for them to invest. Thus they strongly request the national government to give the subsidies for supporting the investment of recharging device for EVs. They also consider that the transportation system should be restructured in a long run by coordinating the private-based service and the public regulation. They request the government to introduce a land-use planning in which the land-use pattern is changed into the physically compacted style where the public transportation is the main transportation mean for the local mobility.

**Parking-space-operation-based carsharing operator**

This is the private company that originally runs the business to operate the parking spaces. They own a number of off-street parking spaces in the nation, particularly in urban areas. Recently they have invested actively small-scale parking spaces in the residential areas. They regard as if the parking space were the public transit stops. They assume that the urban transportation network is divided into the two types: the carsharing service network is a primary transportation network whereas the access links connecting an origin to the carsharing station and the egress links connecting the carsharing station with a destination are the secondary transportation network. They consider that the well-planned secondary transportation network will support the primary public transit network. In order to improve the secondary transportation network, the parking space should be well-developed, particularly which is open for twenty-four hours a day. As they have already had the parking-space monitoring system as well as the active maintenance system in their parking-space business, they can use much of such existing system. This gives them a strong motivation to integrate the parking-space business with the carsharing business. They are strongly concerned with the sustainable parking-space market. They are afraid that the consumers have recently lost their interest in automobile in Japan. They have a marketing strategy to increase the consumer’s motivation to drive the cars by providing the opportunity to drive high-quality cars for the carsharing users. They also consider that the provision of appropriate information relating the location of carsharing stations is one of the most critical issues for achieving carsharing customers. The dynamic optimization of car allocation among the stations is also one of their important strategies. Additionally they estimate that the parking-space charge and the vehicle purchase cost are critical among the fixed cost elements. They suppose the carsharing vehicles can be resold in the second-hand market at considerable price; thus the vehicle purchase cost could be smaller in the carsharing business than that in rent-a-car business. This is because the period in which the vehicle is used for the carsharing service is short enough to be damaged less during the drive for carsharing than that for rent-a-car.

Currently they are focusing on the expansion of their business by making best use of their original business, parking-space operation. This means that they put the highest priority on the survival in the tough competition of carsharing business rather than the cooperation with the competitors and/or other business partners.

**Gas-station-operation-based carsharing operator**

This company runs mainly oil business importing the crude oil, refining it, and selling the gasoline and other oil product in Japan. They have a number of service stations throughout Japan. Their goal is to support the customers and society as a whole as an energy solution provider. They have been extending their business to a new business of alternative energy resources mainly reflecting the recent worldwide decline of oil consumption due to the high cost of oil production and the environmental concerns of the society. They have just started the
carsharing business as a pilot scheme. The current situation is under examination of feasibility of this new
business. One of the motivations for starting the carsharing business is to make use of their existing service
station network. As they suppose that it is difficult to earn the positive profit only from the carsharing business,
they have the strategy to gain new customers of service stations by adding the value of carsharing service to that
of the service station service. In addition to the simple carsharing service, other services such as vehicle
maintenance and retailing service are considered to introduce at the service stations.

They also consider it difficult to run the carsharing business with EVs because they have poorer
performance in their cost, running distance, and refueling/recharging efficiency than the conventional gasoline
vehicle. Although some customers might choose the EVs in the carsharing business for their simple motivation
of experience, the company does not expect them to be the sustainable customers. It should be noted that the gas
station company generally has the advantage in installation of the quick-charging device compared with other
operators. This is because, in Japan, the legal regulation requires the service stations to have the necessary
permission of installing such the device at their site. However, the current fire regulation in Japan does not allow
the service stations to park the cars for long hours in the service stations mainly due to the safety reason. The
company expects the government to deregulate the fire regulation. They have not yet fixed their strategy on the
partnership with other stakeholders in the light of carsharing business because they are still at the demonstration
stage. Although they expect the future cooperation among the carsharing operators in terms of service contract
with customers, they are afraid that the current regulation does not permit a simultaneous contract between
customers and multiple operators. This is because the current law requires the customers to make an
independent contract with each operator even if the operators establish a consortium consisting of multiple
operators. They also expect the deregulation of one-way carsharing service.

**Urban rail operator**

This is one of the major urban rail private operators in the Tokyo Metropolitan Area, which have a number of
umbrella companies including bus operation and real estate business. They have already had the partnership
with three carsharing operators. Their motivation of partnership with them is to utilize the existing remaining
land plots around the rail stations and existing parking spaces that are not used efficiently. For example, they
provide the EV-based carsharing service in cooperation with a carsharing operator at the building complex
including office, hotel, and parking space. This aims to make use of empty parking space in the building
complex as well as to achieve a better reputation from the customers by supplying the environmentally-friendly
service. This service is mainly used by the office workers but the operating rate is quite low. Although one of
their umbrella companies has also started the carsharing business, it does not run the business proactively. This
is first because they regard that the carsharing market is still small in Japan and second because the role of
carsharing is not clear in the urban transportation network. The rail operator has not yet established its own
department for carsharing service. They are carefully watching the movement of carsharing market.

**Rail-business-based rent-a-car operator**

This company is one of the umbrella companies under a large rail operator. The scope of their carsharing
business covers the access and egress transportation to/from their rail stations. A new carsharing service has
been just started in several stations in the Tokyo Metropolitan Area. They have already set up the rent-a-car
business that combines the rail service and the new carsharing service. They expect the high carsharing demand
at the urban rail stations where the accessibility is poor mainly due to the low level of local bus access service.
One of their motivations of introducing the carsharing service is to utilize the existing vehicles of rent-a-car
service that are not used during the out-of-service hours in a day. They also expect the potential carsharing
market at the rail stations where there is no rent-a-car office. However, they have not planned to extend the
carsharing business immediately. This is because of the difficulty of carsharing demand forecast in addition to
the uncertainty of the carsharing market in the future. They do not consider that they competition with other
carsharing operators and other public transportation operators. They are afraid of the future decline of public
transit rideship. This reflects the recent popularization of in-home working. They are also afraid that in-home
leisure activities such as internet shopping reduce the out-of-home travel frequency of consumers and this will
lead to the decline of public transit demand.

**Urban bus operator**

This is the private bus operating company that has a number of umbrella companies under it such as hotel
business, real estate business, and coach service. They consider that the bus transportation itself contributes to
the global environment and to the improvement of quality of transportation service. They are also positive for
introducing the environmentally-friendly technologies such as the low emission bus. They recognize that the
carsharing is not one of the public transportation modes but one of the personal transportation modes. This means the carsharing is one of the competitors of the public transportation modes including them. They also consider that the rail service is a primary transportation service whereas the bus service is the secondary transportation service in the context of multimodal public transportation network. They complain that the government goal of the past carsharing-related policy seems unclear: does their carsharing policy aim the contribution to the improvement of individual’s mobility or does that aim the reduction of CO2 emission from automobile? They expect that the government fixes clearly their strategy of carsharing in transportation policy.

They may support the carsharing if the government presents the clear strategy, but they probably request additional conditions to the government for doing so.

Department of Transport Planning in the Central Government (MLIT)

This is one of the departments in the national government that is in charge of transportation planning in general. Their goals are (1) infrastructure development for economic growth, (2) regional development for realizing local autonomy, (3) sustainable landscape development and the promotion of tourism on the basis of history and local culture, (4) contribution to the global environmental issues, and (5) establishment of reliable society with safety and security.

The government supported the carsharing at earlier stage by subsidizing the pilot schemes and the demonstration projects. They recognize that the early stage when the government support is required has been already finished and that the carsharing market is now at the stage of private-based development. They clearly understand the importance of setting the goal of carsharing policy. Carsharing may contribute to the reduction of gas emission due to the modal shift from personal car use to shared car use while it may increase the car use due to the improvement of service quality of car use in carsharing market. If the carsharing service increases the car use, it may be one of the attractive business opportunities for private operators. In reality, the carsharing demand has been sharply growing particularly in metropolitan areas in Japan. However, it is not scientifically found out to what extent the carsharing contributes to the global warming issues. Additionally, they are afraid of negative economic impacts of the carsharing on the automobile ownership in Japan. As the automobile industry is one of the main industries in Japan, the promotion of carsharing may damage the domestic economy due to the reduction of automobile sales in Japan. Thus, the government carefully examines the impacts of supporting the carsharing market. Consequently, the government has some expectations on the future development of carsharing market and it identifies the importance of preparing the infrastructure for its market growth, but it considers that there is no urgent requirement for proactively supporting it. The Department strongly requests the scientific research on the impacts of carsharing both on the environment and the economy.

Department of New Transport Service in the Central Government (MLIT)

The Bureau of Automobile Transport which the Department belongs to is one of the bureaus under the Ministry. They are in charge of car registration, reduction of noise and environmental impact, and promotion of public transportation. They regulate the rent-a-car business including the carsharing with the Road Transport Act. The Act requires the rent-a-car business operators to get the permission from the authority to start a new business. This intends to prevent the transportation operators from illegal operation. They know that there are the requests of further deregulation in the carsharing market from the business. However, as the carsharing market was deregulated in 2006, they do not think it is further necessary to deregulate the statutory system relating to carsharing business.

Department of Environmental Issue in a Prefectural Government

The main task of this organization is to plan and to implement the transportation policy that aims to reduce the car traffic volume. The policy includes the travel demand management such as the promotion of efficient car use, the modal shift from automobile to public transportation, travel generation control, and the dynamic control of traffic demand. They have just completed the demonstration project of carsharing in their prefecture in order to examine the impacts of carsharing. This demonstration project introduced a tentative carsharing program under the cooperation among the prefectural government, a public transportation operator, and a carsharing operator. The demonstration project showed that the carsharing increases the individual’s driving with the shared cars while it decreases the individual’s driving with his/her own private car. Although they expect that the reduction of private car use is dominant over the increase of car use in carsharing system, they found that the impact mechanism may be dependent on the conditions including the user’s personal attributes, location, travel purpose, etc. This result makes them to conclude that they should support the carsharing service only when there is the explicit evidence that the carsharing contribute to the reduction of environmental impacts. Although the private carsharing operators request the prefectural government to support them by leasing the publicly-owned parking
spaces and/or open spaces to them, in reality there are little spaces for the use of carsharing station. If the
evidence of positive impact of carsharing on the environment is explicitly presented, they may introduce a new
policy that promotes the users of a public transit operated by the prefectural government to use the carsharing.
This policy includes the introduction of mileage point system for carsharing use. Although the evidence that
carsharing reduces the environmental negative impact is unclear, but that of EV is clear. Thus, they suppose that
the public support to EV-based carsharing business may be encouraged by the local tax payers.

Ward Government
This ward is located at the central business district in the Tokyo Metropolitan Government. As the business
sector consumes the huge volume of electricity in the ward, they have made much effort to reduce the energy
consumption. They have owned the EVs as their official cars and use them for the official activities to reduce
the gas consumption. They also started to use these EVs for carsharing service during the period that the official
use is not expected. This is a partnership program with a private carsharing operator in which the carsharing
service is provided to the local residents and local business. Additionally they have introduced the exemption of
membership charge and the discount system of carsharing use for the local residents and local business. In this
program the Ward Government gives the exclusive right to use their EVs and their parking spaces to the private
carsharing operator while the carsharing operator installs the recharging device as well as manages the
carsharing system. They work jointly under the contract in which the operator can earn the predetermined fixed
profit while the excess profit gained from the project will be reimbursed to the local residents through the Ward
Government. The contract shows that the operator is not allowed to get any financial support from the
Government even if it earns the negative profit. The introduction of carsharing system increased the annual
maintenance cost of the Ward’s official cars by 150,000 Japanese Yen (nearly equal to 180 US dollar) per
vehicle. This is mainly because the legal regulation in Japan requires the carsharing operators to carry out the
regular automobile inspection every year. The tax payers in the Ward accept the cost increase as one of the
expense for the EV promotion. Additionally, the EV recharging devices installed for the carsharing service are
open to be free of charge to the public EV users. Although they have taken much effort to promote the
carsharing, they are now facing the financial sustainability in the service. For promoting the carsharing
particularly using the EVs, they strongly request the national government to give the financial support to the
local government projects.

DISCUSSION
Findings from the stakeholder interviews
The interviews reveal the various opinions of stakeholders in Japanese carsharing market. The main findings are
summarized as follows. First, the expected ways of using the carsharing service recognized by the stakeholders
are categorized into the two types: the one is the primary transportation mode with which a carsharing user
travels from an origin to a destination directly and the other is the secondary transportation mode with which the
carsharing user accesses and/or egresses the public transit service to transfer into public transit service. The
parking-space-operation-based carsharing operator, the gas-station-operation-based carsharing operator, and the
bus operator recognize it as the primary mode while the rent-a-car-operation-based carsharing operator and
urban rail operator recognize it as the secondary mode. When the carsharing is regarded as the primary mode,
the carsharing stations should be located near the origin such as in the residential area whereas it should be near
the destination such as in the shopping area. When it is regarded as the secondary mode, the carsharing stations
should be located near the public transit stops. The assumed ways of carsharing use also influences the
stakeholder’s attitude toward the carsharing. When the bus operators assume the carsharing to be the primary
mode, they regard it as the competitor in the local transportation market. When they assume it to be the
secondary mode, they regard it as a potential partner to integrate the urban transportation network.

Second, currently no carsharing operator has an idea to cooperate each other. The reasons for this are
summarized as follows: first, as the carsharing market has kept growing, the operators can earn the positive
profit even without the partnership; and second the motivation of starting the carsharing for many operators is to
manage their side businesses in which they utilize the existing excess facilities in their main business rather than
to success in the carsharing business only. This may mean that the carsharing market is currently driven by the
supply side rather than the demand side in Japan. The operators compete toughly by investing the carsharing
stations, carsharing cars, and related devices to expand their own market share rather than contribute the
sustainable market growth by improving the compatibility among the different carsharing services.

Third, the perceptions and expectation of carsharing operators are different from those of the national
government. The carsharing operators expect the government to support the carsharing market while the
government does not find the clear reasons for supporting it. The support assumed by the operators includes the
The carsharing market emerged about a decade ago in Japan. It is still regarded as one of the new transportation means by many stakeholders. Additionally the carsharing business has so far developed independently from the conventional transportation planning process in Japan. Thus, its role and significance in the urban transportation system are not well understood and not shared among the stakeholders including the operators, government, and transportation planners. Should one stakeholder cooperate with another stakeholder in the context of carsharing market? This depends on the conditions to be considered. On the basis of the above stakeholder analysis the authors raise the three potential cases where the cooperation among stakeholders could be required in the urban carsharing market.

The first is the case in which the poor cooperation harms the benefit of carsharing users. One of its reasons is that the technological incompatibility among different operator’s systems could deteriorate the quality of service. For example, many carsharing operators currently adopt the different membership system, ticketing system, and reservation system independently. This partly aims to enclose their customers within own services; but this leads to the poor integrity of carsharing network. An individual who is a member of one carsharing operator cannot use the carsharing service of other operators. The individuals also need to understand the different reservation systems simultaneously for using the different operator’s carsharing services. The integration of membership, ticketing, and reservation systems could solve the inconvenience of customers.

Another reason for lower user’s benefit caused by poor-cooperation is that the economy of scale does not work well under the independent operations. The initial investment of the parking spaces is costly for a single operator while the accessibility to the carsharing is highly dependent on the density of carsharing stations. If the existing carsharing stations are shared or new stations are jointly invested among different operators, the accessibility to the stations may be improved significantly. Additionally, when the economy of scale works, the carsharing charge may be reduced due to the investment cost savings. This also contributes to the user’s benefit.

The second is the case in which the poor coordination increases the external cost from transportation market, mainly the negative environmental impacts and the traffic congestion. As shown earlier, the Department of Transport Planning in the MLIT and the Department of Environmental Issue in a Prefectural Government are concerned with the negative impacts of the carsharing on the global warming. It may be true that the public transportation users shift to carsharing and this may increase the car use in total if the carsharing operators provide the primary transportation mode service to the customers. However, if the carsharing operators provide the secondary mode service under joint business planning with public transportation operators, the private car drivers may shift to the joint service of carsharing and public transportation; and this could contribute to the reduction of environmental impacts. The results of our stakeholder analysis suggest that there is no guarantee that the market-oriented strategy leads to the secondary-mode-based carsharing service in Japan. This may imply that the Government needs to promote the secondary-mode-based carsharing service rather than the primary-mode-based carsharing service in order to reduce the external cost.
The third is the case in which the poor coordination slows down the economic growth. For example, the Department of Transport Planning in the MLIT worries about the negative impacts of carsharing on the automobile industry. However, the carsharing could be used for advertising the automobiles to the customers. If the automobile producers establish a partnership with the carsharing operators, they could have a good opportunity to demonstrate a new brand of automobiles; and this may encourage the car ownership. Although it may sound curiously, theoretically the promotion of car ownership does not always mean the promotion of car use. The motivation of some car owners particularly who wants to buy a new brand car may be to achieve the status symbol rather than to drive the cars. Actually, many of the car owners drive on weekend days only in the Tokyo Metropolitan Area. In this sense, the sales promotion of automobile through the carsharing may be acceptable.

CONCLUSIONS

This paper presented the current carsharing market in Japan through the interviews with major stakeholders. It showed that the stakeholders recognize two types of carsharing: the primary-mode-based system and the secondary-mode-based system; no carsharing operator has an idea to cooperate each other currently; the perceptions and expectation of carsharing operators are different from those of the national government; and the local governments have tried to introduce the carsharing system but suffer from the uncertainty regarding the effects of carsharing. Finally, the three potential cases where the cooperation is required among stakeholders in urban carsharing market are summarized: (1) the poor cooperation harms the benefit of carsharing users; (2) the poor coordination increases the external cost from transportation market; and (3) the poor coordination slows down the economic growth.

Finally, as the scope of this paper is limited to the carsharing market in the urban areas, the interviewees are selected from the stakeholders in the Tokyo Metropolitan Area. However, the feasibility of cooperating among the stakeholders in the rural carsharing market should be also explored. This is because the poor coordination may worsen the inequality among different social groups or may cause the serious social exclusion particularly in the rural areas. It should be noted that currently the most of carsharing services are available only in urban areas in Japan. One example of the problems in rural carsharing market is the poor accessibility of the public-transportation-use travelers from urban areas to rural areas. If there is no carsharing system is provided at the rural area, they may find the difficulties to access from the public transit stop that they get off to the final destination that is located far from the station. Another example is the social inclusion of the refugees who evacuated from the areas damaged by tsunami in Tohoku region, Japan. They may suffer from the poor mobility mainly due to the lack of their private cars. The government could have some cooperation with private operators to provide the shared car system to support such the refugees to participate in the social activities.

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