

Institutional System and Current Problems of Car Parking in Tokyo, Japan

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Abstract.

This paper aims to review the current institutional system and to identify the problems pertaining to the car-parking and parking spaces in the Tokyo Metropolitan Area, Japan. The study consists of the following three parts: literature review of institutional system of parking policy in Japan; local interviews with experts and major stakeholders regarding parking policy; and two original surveys on car-parking demand and use of local people in Tokyo. The results present the current problems regarding parking policy in Japan, including the lack of integrated institutional system; the lack of parking space for freight traffic and motorbike; and no participation of private parking operators in the process of making the local parking policy.

Keywords: car parking, institutional system, current problem identification, Tokyo

1. Introduction

This paper aims to review the current institutional system and to identify the problems pertaining to the car-parking and parking spaces in the Tokyo Metropolitan Area, Japan. The study consists of three parts. The first part reviews the institutional system regarding the parking policy in Japan by literature reviews. The second part interviews the experts and the major stakeholders related to local parking policy in Tokyo. We interviewed them about the current parking policies, their identification of parking-related problems in Tokyo, and their request to other actors. The third part includes two surveys. One is a questionnaire survey about the parking demand and their opinions about the local parking policy in Tokyo. The other is an observation survey of dynamic parking use by using online data.

The paper is organized as follows. Chapter 1 shows the objectives of this report. Chapter 2 summarizes the statutory system of parking in Japan. Chapter 3 describes the current problems regarding parking and parking-related policy on the basis of interview results. Chapter 4 presents the results of questionnaire survey and the observation survey in Tokyo. The achievements of the study will be summarized in Chapter 5.

2. Parking System in Japan

2.1 Overview

First of all, “parking” is defined in Road Traffic Act in Japan. It is defined in two ways. The first way defines the parking as a status in which a driver stops his/her car continuously so as to wait for goods or people, to load/unload the goods to and from his/her car for 5 minutes or more, or to deal with accidents. The second way defines the parking as a status in which a driver goes away from the car and cannot restart his/her car immediately. Generally, the parking is divided into On-street Parking and Off-street Parking. The structure of parking system in Japan is shown in Figure 1 (Japan Society of Traffic Engineers, 2006). First, the On-street Parking is categorized into the following three types: On-street Parking Space regulated in Parking Act; On-street Parking Facilities regulated in Road Act; and On-street Parking at Parking Meter/Parking Ticket Machine regulated in Road Traffic Act. Note that some experts point out that the short stop at a stopping lane should be also included as one of the on-street parking spaces. Next, the Off-street Parking is categorized into the following two types: Off-street Parking for Specific Users and Off-street Parking for the Public. The Off-street Parking for Specific Users is further grouped into Obligatory Parking Space regulated in Parking Act and Private Parking Space regulated in Civil Law. The Off-street Parking for the Public is further grouped into Obligatory Parking Space regulated in Parking Act, Coin-operated parking Space over 500 m² regulated in Parking Act, Coin-operated parking Space 500 m² or less regulated in Parking Act, and City-Planning-based Parking Space regulated in City Planning Act and Parking Act.



Figure 1 Structure of Parking System in Japan

Private Parking Space regulated mainly in Civil Law. The Off-street Parking for the Public is further grouped into the following four types: Obligatory Parking Space regulated in Parking Act; Coin-operated Parking Space of over 500 square meters regulated in Parking Act; Coin-operated Parking Space of 500 square meters or less regulated in Parking Act; and City-Planning-based Parking Space regulated in City Planning Act and Parking Act. Finally, it should be noted that the parking policy in Japan highlights the Off-street Parking, particularly the City-Planning-based Parking, rather than the On-street Parking.

2.2 On-street Parking

In Japan, the drivers are not allowed to park their cars on streets in major cities. The exceptions are shown below.

2.2.1 On-street Parking Space

The On-street Parking Space is regulated in Parking Act. Note that this type of parking is regulated by Ministry of Land, Infrastructure, Transport and Tourism (MLIT). The on-street parking space is set in the Parking Space Development Zone by the local government. See “City-Planning-based Parking Space” for the details of the Zone. The On-street Parking Space is regarded as a supplement of the City-Planning-based Off-street Parking Space in the Zone. The local governments need to make an agreement from a Local Public Safety Commission when setting the On-street Parking Space. The users of the On-street Parking Space are required to pay the parking charges to the local government depending on their parking duration. The On-street Parking charge is controlled so as to be nearly equal to the prices of the Off-street Parking around the On-street Parking Space. The local government must use the revenue from On-street Parking not only for administrating the On-street Parking Spaces but also for developing the Off-street Parking Spaces.

2.2.2 On-street Parking Facilities

The On-street Parking Facilities are regulated in Road Act. Note that this type of parking is also regulated by MLIT. The On-street Parking Facilities are set outside of roadways by road administrators. The users of On-street Facilities are required to pay the parking charges to the local governments depending on their parking duration. The on-street parking facilities are also regarded as a supplement of the City-Planning-based off-street parking spaces.

2.2.3 On-street Parking at Parking Meter/Parking Ticket Machines

The On-street Parking at Parking Meters or Parking Ticket Machines is regulated in Road Traffic Act. Note that this type of parking is regulated by Nation Policy Agency. The Local Public Safety Commission can set the parking meters and/or parking tickets along the road

where the illegal on-street parking should be minimized. The users of parking meters and parking tickets are required to pay not the parking charge but the administrative service cost to the Commission. The parking time is fixed as 60 or 40 minutes. If the parking time is expired, the users must pay the fine for violating parking rule.

2.2.4 Short stop at a stopping lane

Some experts point out that the short stop at a stopping lane should be also included as one of the on-street parking spaces. The stopping lane is defined in Road Structure Act while the short stop at the stopping lane is defined in Road Traffic Act. Note that the stopping lane is regulated by MLIT. The short stop at the stopping lane is defined as the status in which a driver stops continuously so as to load/unload the goods within 5 minutes or to let people get on/off the car at the stopping lane. The short stop at the stopping lane is free of charge. The Acts state that the road administrator mainly in urban districts can set the stopping lanes on the left side of roads in order to realize the smooth and safe traffic flows. The width of the stopping lanes is 1.5 meter to 2.5 meters.

2.3 Off-Street Parking

2.3.1 Obligatory Off-street Parking Spaces

The Obligatory Parking Space for the Public is regulated in Parking Act while the Obligatory Parking Space for the large-scale retail store is regulated both in Parking Act and in Large-Scale Retail Stores Act. First, Parking Act states that local governments can establish the local parking regulations. Article 20 of Parking Act states that the local regulations can order the owners of large buildings of over 2,000 square meters and special-purpose building including theaters, department stores, and office buildings to establish the off-street parking areas. The off-street parking areas must have the space enough to cover the parking demand of the building. Next, Large-Scale Retail Stores Act prescribes the guideline and processes for establishing a new large-scale retail store, including parking spaces for visitors. Article 4 of Large-Scale Retail Stores Act states that the Minister of Economy, Trade and Industry issues a guideline for those who want to build a new large-scale retail store. The guideline includes the basic issues which the retailers must care about when starting business and preparing facilities. It intends to avoid the traffic disorder and the serious impacts on local environment caused by the traffic to and from the stores. They include a baseline of parking capacity for large-scale retail stores. Article 5 of Large-Scale Retail Stores Act requires those who want to build the new large-scale retail stores to submit a document about opening of the stores. The document should contain the exact location of parking space; its capacity; its opening hours; and the number of parking entrance/exit. The document must also include the method to calculate the parking capacity

which can cover the parking demand; the method to design the parking structure; and the method to estimate the number of entrance/exit. Additionally, the applicants for building new large-scale retail stores are required to show their plans to guide the cars to their parking spaces such as guiding routes, the number of signboards and the traffic-control staffs.

2.3.2 Private Off-street Parking Space

There are the three types of Private Off-street Parking Spaces. All of them are supplied and managed under private contracts (Nosaka et al., 2008). The first type of parking space is supplied and managed in which land owner rents the property to land borrowers for their parking purposes. In this case, the parking contract is legally regarded as the lease of land (Civil Law Article 601-). The owner of parking space is not allowed to relocate the borrowers' cars without their permission. This is because the borrowers have their right to occupy the land even if the land owner has its property right. The second type of parking space is supplied and managed in which car drivers request a parking manager to handle their cars. Usually a parking manager receives the keys of cars from drivers at the entrance of parking space and takes care of the cars in the parking space during a given period. This type of parking contract is legally regarded as deposit of cars (Civil Law Article 657-). In this case, the parking manager can relocate the customer's cars in the parking space. The third type of parking space is Coin-operated Parking Space. The parking-ticket machine is installed at the Coin-operated Parking Space but no one manages the cars at the sight. The Coin-operated Parking Spaces have become more popular rapidly since the revision of Road Traffic Act in 2006. However, the Coin-operated Parking is not clearly defined or regulated from the legal viewpoint. In practice, the contract of Coin-operated Parking follows the Parking Act. Article 13 of Parking Act requires the owners of parking space of over 500 square meters to prepare a provision to supervise the parking space. The provision is used for avoiding the legal trouble between contractors. An example of provision shown by the central government is widely used for preparing the provision. The provision usually describes that the legal troubles regarding the Coin-operated Parking are solved basically in the same way as the second type of Private Off-street Parking Space. Note that the owners of parking space of 500 square meters or less also often use the same provision for their contract.

2.3.3 City-Planning-based Parking Space

The City-Planning-based Off-street Parking is regulated in Parking Act. This type of parking space is regarded as the public parking space. Note that this type of parking is regulated by Ministry of Land, Infrastructure, Transport and Tourism. Chapters 2 to 4 of Parking Act define Parking Space Development Zone. The parking space developed in the Parking Space

Development Zone is called as City-Planning-based Parking Space. The Parking Space Development Zone is set by the local government to develop parking spaces in urban areas. Article 3 of Parking Act shows that each prefectural government can set the Zones in the areas including commercial zone and residential zone where the traffic volume is considerably high. Note that the commercial zone and residential zone are set by the prefectural government in their statutory city plan under the regulation of City Planning Act. The prefectural governments are requested to prepare a parking development plan on the basis of parking demand and supply at present and in the future when setting the Zones. Note that the parking policy in Japan seems to consider that the public parking space should be provided as the Off-street Parking Space. For example, Article 7 of Parking Act, which prescribes the parking charge, states that the revenue from the parking charge of City-Planning-based Parking Space must be used for constructing the Off-street Parking Space in addition to for maintaining the On-street Parking Space.

3. Problems Structure of Parking Policy in Tokyo

3.1 Method

The semi-structured interviews are used to figure out the problems regarding the local parking policy in Tokyo. The experts include Dr. Shinji Tanaka in the University of Tokyo and Dr. Satoru Kobayakawa in Nihon University. The stakeholders include the government officials in the Ministry of Land, Infrastructure and Transport and Tourism, the Tokyo Metropolitan Government, the Tokyo Metropolitan Police Agency, and Chuo Ward office. The interviews were carried out from November to December, 2009. The average interview time is about 1.5 hours.

3.2 Major Stakeholders in Parking Policy

There are the four actors relating parking policy: the central government, prefectural government, district government, and local police agency. The central government, the Ministry of Land, Infrastructure, Transport and Tourism monitors and manages the national parking policy. Although they used to have the power to make the decisions and/or give the direct guidance on the local parking policy, they lost their power through the decentralization process. Currently, the main roles of the central government are to collect the data and to present good practices of local policies to the local governments (Ministry of Land, Infrastructure, Transport and Tourism, 2009). Their policy target is to develop the compact city where the car-use demand is reduced. Next, local police agency takes a role to control the road traffic. They consider that the road should not be used for car parking spaces but for car traffic. Thus, they strongly request the development of off-street parking spaces. On the other hand, some experts and local governments request the utilization of on-street space for short-time parking. And local police

agency itself supervises parking meters (one important type of on-street type parking). They said in principle, parking meters should be eliminated, but as many claims from citizens concentrated to police agency, they have to care about these voices because their regulation is authorized through the trust of citizens. The prefectural governments set up the local parking policy and prepare the guideline for local parking management. They have the two approaches to manage the local parking policy. The first approach is to arrange their local parking ordinances. Although many local parking ordinances follow the guideline presented the central government, some local governments including the Tokyo Metropolitan Government introduce their original ordinance by taking their unique conditions into account. One of the unique trials in the Tokyo Metropolitan Government is to allow the district government to launch the special rule, such as Ginza rule in Chuo Ward (Chuo Ward, 2003). The second approach is to prepare their original guidelines for the district governments and/or operators. For example, the Tokyo Metropolitan Government prepares the “Integrated Parking Planning Guideline” (Tokyo Metropolitan Government, 2007) and Hyogo Prefecture prepares their original guideline (Hyogo Prefectural Government, 2008). Although the prefectural governments insist that they respect the decisions made by each district, the prefectural governments often intervene the local parking policy in the districts. Some district governments like Chuo Ward propose many unique rules, some of which include flexible usage of on-street parking, but they say that only some of these are accepted by Metropolitan government or Metropolitan police agency. This is maybe because the police agency clings to the principle that on-street parking should not be allowed, and Metropolitan government also have to care about equality among districts, so they cannot say OK to all of the policies the district propose though they promote original rules to each district. The central government, the Ministry of Land, Infrastructure, Transport and Tourism is also conscious of the latter problem. They say that while some prefectures or districts can make and manage a good policy of parking fitted to each area, there also exist many prefectures or districts which do not have enough budget and human resources to do that. It can be said that this is one of the problem that Japan’s nationwide decentralization policy yields.

3.3 Current Problems Regarding Parking Policy in Tokyo

First, the three major problems regarding the current parking policy were pointed out by the interviewees. The first problem is the lack of parking space for freight traffic particularly caused by the new management system of illegal on-street parking introduced in June 2006. Under the new system, the private operators are allowed to monitor the streets and manage the illegal on-street parking. This aims to improve the efficiency of managing the illegal on-street parking. Note that the local police agency used to be in charge of managing the illegal on-street parking in the old system. The new system has reduced dramatically the illegal on-street parking of

private cars whereas it has increased the off-street parking of private cars slightly in urban areas. This may mean that the individuals who used to use their cars give up using their cars by changing their travel mode or by changing their destinations. On the other hand, the new system causes the serious problems for the freight truck drivers. Many freight truck drivers face difficulties to search the parking spaces in the vicinity of their final destinations. Some stakeholders including the Japan Trucking Association consider that the small-scale freight operators have started to use the off-street parking spaces more while the large-scale freight operators and major chain shops such as convenience stores came to prepare their own parking spaces for their logistics system even after the new management system was introduced. However, in reality, a number of small-scale freight operators are forced to use the on-street parking even if they know it is illegal. The second problem is the lack of parking space for motorbikes. This was also caused by the new management system of illegal on-street parking. Although the new system covers the motorbikes in addition to cars, few off-street parking spaces are prepared for motorbikes. The central government currently promotes the installation of parking spaces for motorbikes at the off-street parking facilities. The third problem is the inflexibility of design code of obligatory parking space. The design code requires the building owner to prepare the parking space with a specific volume by a given formula. This is applied even to skyscrapers located near the rail stations, where the most visitors use the public transit to access. Note that many station areas have been recently redeveloped in Tokyo. The central government is now deregulating the design code with which the local government can arrange the parking space flexibly.

Then, the two problems regarding the decision-making system of parking policy were pointed out. The first problem is the lack of organization to coordinate the policy development among public sectors. Although there are various types of parking spaces including the on-street parking space and off-street parking space, no authority covers all of them. Thus, it is difficult to examine the integrated parking policy at local level. The second problem is the lack of participation of private parking operators in the process of making the local parking policy. This is partly because there is no regulation about the private parking business. The governments cannot grasp even the number of parking spaces given by the private operators. This should lead to the unbalanced and incomplete planning of parking spaces

4. Questionnaire Survey on Car Parking in Tokyo

4.1 Motivation and Method

The survey on car parking aims to collect the data of daily car-use and car parking of local households in Tokyo. The students studying at the Department of Civil Engineering, The University of Tokyo (UT) were requested to interview their household members who mainly use

his/her cars. The paper-based questionnaire sheet was designed by the Tokyo study team. The survey sheet includes the questions regarding the socio-demographics; the car-use travel episode on the latest day when using the car; the parking location choice on the latest day when parking the car; and the preference on car parking. The survey was carried out on November 27 to December 11, 2009 by one of the members from the Tokyo study team. The data were collected from 25 respondents. 10 respondents reside in Tokyo whereas 15 respondents reside outside Tokyo, including 8 respondents in Kanagawa; 4 respondents in Saitama; 2 respondents in Chiba and 1 respondent in Ibaragi.

4.2 Survey Results

4.2.1 Travel mode, car ownership, and car use

First, 50 percent of respondents own their car(s) in Tokyo while 80 percent of respondents own their car(s) outside Tokyo. 12 respondents out of 18 car owners own their garages at home while 2 respondents use the shared parking space installed at their apartment and 4 respondents use the monthly-rental car parking spaces operated by private parking space companies. The monthly parking charge varies from 9,450 yen to 30,000 yen. Note that 1 US dollar is nearly equal to 95 yen as of December, 2009. Next, 23 respondents use rail for their commuting to their workplaces while only 2 respondents use bicycle or walk for their commuting. This means that no respondent use car for their commuting. This reflects the long travel distance for commuting as well as the well-developed public transportation network in the Tokyo Metropolitan Area. Finally, 40 percent of respondents answered that they usually use their cars mainly for shopping. However, many of them also use their cars for going to the rail stations as well. This probably means that the cars are sometimes used for taking or picking up the family members to and from the rail stations in addition to going shopping. 4 respondents out of 15 households who used the cars drove their car alone.

4.2.2 Parking space choice

First, interestingly, no respondent paid parking charge during the latest car-use travels. It should be noted that 4 respondents used the discounted or free-charged parking services given by the commercial facilities. This reflects that many commercial retailers or shopping malls provide the discounted parking services to the customers who satisfy the given condition in Japan. One of the typical conditions is to consume the given amount of money or more at their facilities. Next, 92 percent of respondents answered that they usually plan the location to park their cars in advance of arriving at the destination. The main reasons for pre-planning of parking location are because they have the experience to visit there in the past and/or because they have used the parking spaces. Only 2 respondents answered that they have no plan about the parking location

before arriving at the destination. They answered that they could find successfully proper parking spaces within 5 minutes without any difficulties.

4.2.3 Preference of car-ownership and parking space

First, 90 percent of respondents residing in Tokyo think that car is not essential in the Tokyo Metropolitan Area whereas 73 percent of respondents think that car is not essential. This probably reflects the high quality of public transit network/service and the expensive land-price in the Tokyo Metropolitan Area. Second, 15 respondents out of 21 households answered that the most important factor for car parking is the closeness of the car-parking space to and from the final destination. Interestingly, only 3 respondents answered that the cheapness is the most important. This may mean that many parking spaces in Tokyo are located quite far from the destination. Third, 52 percent of respondents answered that they have felt the inconvenience by not using on-street parking spaces although it was near the destination. This means that the potential demand for using on-street parking is high but the on-street car parking is not allowed or it cannot be used due to some reasons. Fourth, 72 percent of respondents think that the number and the quality of parking spaces in Tokyo are unsatisfied. 22 percent of respondents answered that they are not satisfied with the current on-street parking regulation policy in Tokyo because they often find other cars which are parking illegally on street. Finally, 13 respondents out of 25 respondents answered that the well-developed public transit service does not require the local resident to use the car in Tokyo. 7 respondents out of 8 no-car owners answered that they are satisfied with the high quality of public transit service in Tokyo. However, the respondents residing outside Tokyo answered that the car may be needed outside Tokyo. This is probably because the public transit service in suburban area is not as good as in urban area.

5. Observation of Parking Occupancy in Tokyo through Website

5.1 Motivation

This survey aims to collect the data of major parking spaces, including parking facilities, capacity, and occupancy in Tokyo. The survey used a web site (<http://www.s-park.jp/>), in which the data of parking space is open to the public. The web site includes the data of location, price, capacity, and vacancy situation of each parking space. We collected the data in the three zones representing the typical land-use patterns in Tokyo. The three zones are Ginza, Tokyo, and Setagaya. Ginza is selected as a representative of commercial zone, Tokyo is selected as a representative of business zone, and Setagaya is selected as a representative of residential zone. Each zone covers 2.25 square kilometers. Note that the parking spaces covered by this web site are the off-street temporary parking spaces. The temporary parking spaces do not include the monthly- or annually-contracted parking spaces, which are mainly used for long-term parking

spaces. The following data of in the three zones has been collected: capacity of parking space including the maximum number of cars parked in the parking space; type of parking space; price system; dynamic parking occupancy: full/congested/vacant. The data of parking occupancy was collected at 9:00 am, 1:00 pm, and 7:00 pm on the two days, including a weekday (December 16, 2009) and a weekend day (December 20, 2009).

5.2 Survey Results

5.2.1 Parking capacity

The observed number of parking spaces and the parking capacity in the three zones are shown in Table 1. This shows that Ginza has the most parking spaces and the highest capacity among the three regions; and it was followed by Tokyo and Setagaya. This simply reflects the car-parking demand in the zone. First, the commercial facilities including retailers and restaurant in Ginza attract many customers visiting for shopping while they also generate the goods-transport demand. Thus, the car-parking spaces in Ginza are used by both the car-use visitors for shopping and the trucks loading/unloading the goods. Second, Tokyo is one of the busiest business zones. Although it attracts many travelers including businesspersons, commuters, and tourists, most of them do not use cars but rail to access there. It should be noted that Tokyo is located at the center of urban rail network in the Tokyo Metropolitan Area and the vast majority of commuters use the public transit for commuting to their workplace. However, the business travels and/or the freight transport generate to and from the offices in Tokyo. This means that the car-parking spaces in Tokyo are used mainly by business cars or freight trucks. Third, the number and capacities of parking spaces in Setagaya are lower than in other areas. This is first because the goods-transport demand is small. The goods transport in residential area is usually limited into the delivery service. This is second because the car parking demand for local residents is also small. The most households have their garages at home or use the monthly- or annually-contracted parking spaces.

Table 1: Number of parking spaces and parking facilities in three zones

	Number of parking spaces	Parking capacity
Tokyo	99	8,938
Ginza	140	26,700
Setagaya	46	356

5.2.2 Parking charge

Figure 2 shows that the parking charge in the three zones during daytime and nighttime. First, the parking charge during daytime is defined as the charge per 10-minute parking whereas the

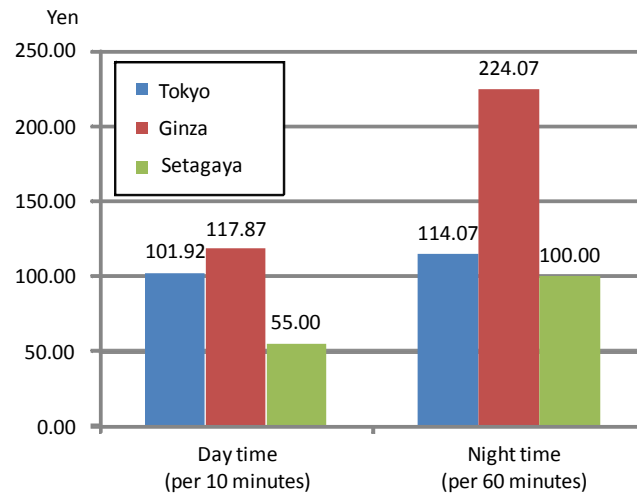


Figure 2 Comparison of parking charges by zone and by time of a day

charge during nighttime is defined as the charge per 60-minute parking. This is probably because the short-time parking demand is dominant during daytime while the over-night parking demand is dominant during nighttime. Second, the parking charge during daytime is higher than the charge during nighttime in all zones. This is simply because the car-parking demand is higher during daytime than during nighttime. Third, the parking charge during daytime is about six-time higher than the parking charge during nighttime in Tokyo whereas the parking charge during daytime is about three-time higher than the parking charge during nighttime in Ginza and Setagaya. This probably reflects the dynamic change in car-parking demand of non-freight transportation. The higher the car-parking demand is, the higher the parking charge is. On the one hand, the car-parking demand for shopping or private purposes keeps quite low all day long in Tokyo. On the other hand, the car-parking demand for shopping during daytime is much higher than during nighttime in Ginza whereas the car-parking demand for private purpose during daytime is higher than during nighttime. Fourth, the parking charge is the most expensive in Ginza and it is followed by Tokyo and by Setagaya. This reflects the difference of car-parking demand among zones. Finally, the parking charge does not vary among a week day and a weekend day.

5.2.3 Occupancy of parking space

Figure 3 shows the percentage of congested or fully-occupied parking spaces on the weekday by zone and by time of a day. This percentage means the average congestion rate at a specific time in a given zone. First, the congestion rate in Tokyo is the highest among zones and followed by Ginza and by Setagaya at 9:00 on the weekday. This is probably because some business-purpose car-users use the parking spaces even early in the morning in Tokyo whereas no shopping-purpose car-user or delivery-service truck visits the commercial area in Ginza early in

the morning; and no private-purpose car-use or delivery-service truck visits the residential zone Setagaya early in the morning. Second, the congestion rate in Setagaya is the highest among zones and followed by Ginza and Tokyo both at 13:00 and at 19:00 on the weekday. This is first because more delivery-service trucks and private-purpose cars use parking spaces in the afternoon than in the morning in Setagaya. This is second because the visitors for shopping at Ginza are less on a weekday than on a weekend day. This is third because the car-parking

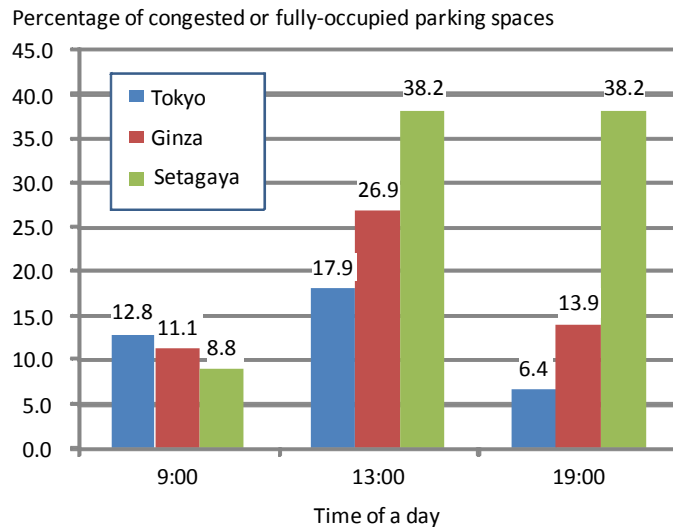


Figure 3 Percentage of congested or fully-occupied parking spaces on a weekday by zone and by time of a day

demand does not vary so much among the times of a day in Tokyo. Third, the congestion rates at 13:00 are the highest among the times of a day both in Tokyo and in Ginza whereas the congestion rate at 13:00 is the same as the rate at 19:00 in Setagaya. This means that the business and the commercial activities are the busiest in the early afternoon in Tokyo and in Ginza, respectively whereas the delivery-service trucks and the private-purpose cars visit the residential areas constantly from early afternoon to evening. Fourth, the highest congestion rates are 38.2 percent observed at 13:00 and 19:00 in Setagaya. This may mean that the car-parking capacity does not match the demand at some parking spaces in Setagaya. Fifth, the congestion rates vary more among the times of a day in Setagaya than in other zones. Particularly in Setagaya, the car-parking demand from early afternoon to evening is much higher than that in the morning and at night. The gap of demand between peak-time and off-peak time may make the car-parking companies reluctant to supply the car-parking spaces in Setagaya.

Figure 4 shows the percentage of congested or fully-occupied parking spaces on the weekend day by zone and by time. First, the congestion rate in Tokyo is the lowest among zones and followed by Ginza and by Setagaya at 9:00 on the weekend day. This is probably because no business-purpose car travel or the freight transport visits the business district around Tokyo

during the weekend. Second, the congestion rate in Tokyo is the highest among zones at 13:00 on the weekend day and followed by Ginza. The high congestion rate in Tokyo may reflect the recent development of commercial facilities around central Tokyo station. Many visitors for shopping use the car-parking spaces in Tokyo and in Ginza in the early afternoon on the weekend day. Third, the congestion rate in Ginza is the highest among zones at 19:00 on the weekend day. This is probably because many people eat out at the restaurants in Ginza.

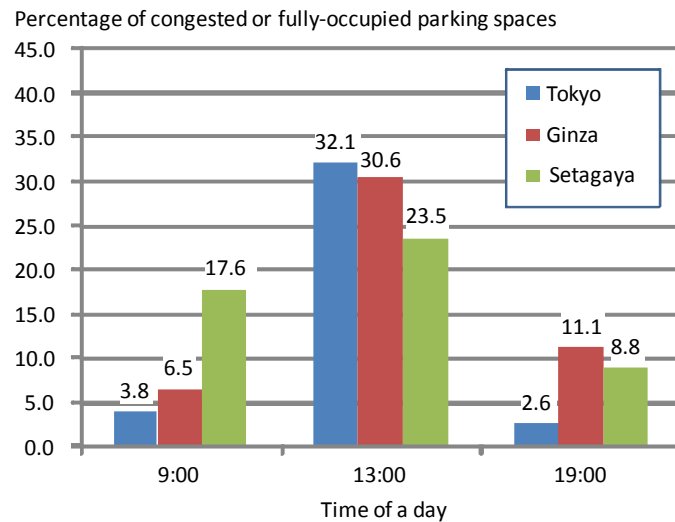


Figure 4 Percentage of congested or fully-occupied parking spaces on a weekend day by zone and by time of a day

Although many commercial facilities have been also developed in Tokyo, most of them are retailers rather than restaurants. Fourth, the congestion rate is the highest at 13:00 among the times of a day in all zones. This reflects the time variation of people’s travel demand on the weekend day.

6. Conclusions

This paper reports the institutional system of car parking in Japan and the current problems regarding the car parking in the Tokyo Metropolitan Area, Japan. The achievements of our study are summarized as follows.

First, the parking spaces are categorized into nine types by the related laws and acts. This indicates that the car parking spaces are regulated by various laws/acts in the different context. This means that there is no integrated institutional system of parking spaces in Japan.

Next, the stakeholder interview was carried out. We have four important stakeholders who decide Tokyo’s parking policy: the Ministry of Land, Infrastructure, Transport and Tourism, Tokyo metropolitan government, district government, and local police agency. Each stakeholder is working to realize their ideal parking policy, but they have different ends and means. That

enables sometimes contradictory policies co-exist in total structure of the parking policy. Through the interviews to these stakeholders, the problems of car-parking are identified. They include the lack of parking space for freight traffic; the lack of parking space for motorbikes; the inflexibility of design code of obligatory parking space; no organization to coordinate the policy development among public sectors; and no participation of private parking operators in the process of making the local parking policy.

Then, the questionnaire survey was carried out to collect the data of car-parking in Tokyo. The results show: (1) car-use travel demand is lower in Tokyo mainly because the public transit system is well developed and the parking space is expensive whereas the car-use travel demand is higher outside Tokyo; (2) car is used not for commuting but mainly for going shopping or other purposes; (3) many car users pay no charge or discounted charge for car parking at commercial facilities; (4) the vast majority of car users have their plans about where to park in advance; (5) the majority of car users think that the closeness of parking spaces from the destination is the most important factor to determine the parking location; (6) the demand for using the on-parking space is quite high but many people are unsatisfied with the on-street parking because they cannot use it as they like; (7) Illegal on-street parking cars frustrates other car users using off-street parking spaces; and (8) many car-users are unsatisfied with the quality and volume of current car-parking spaces.

Finally, the observation survey was carried out to collect the data of real-time use of car-parking spaces. The survey covers Tokyo, Ginza, and Setagaya. The results show: (1) Ginza has the most parking spaces and the highest capacity among the three zones; and it was followed by Tokyo and Setagaya; (2) the parking charge during daytime is defined as the charge per 10-minute parking whereas the charge during nighttime is defined as the charge per 60-minute parking; (3) the parking charge during daytime is higher than the charge during nighttime in all zones; (4) the parking charge during daytime is about six-time higher than the parking charge during nighttime in Tokyo whereas the parking charge during daytime is about three-time higher than the parking charge during nighttime in Ginza and Setagaya; (5) the parking charge is the most expensive in Ginza and it is followed by Tokyo and by Setagaya; (6) the parking charge does not vary among a week day and a weekend day; (7) the congestion rate in Tokyo is the highest among zones and followed by Ginza and by Setagaya at 9:00 on the weekday; (8) the congestion rate in Setagaya is the highest among zones and followed by Ginza and Tokyo both at 13:00 and at 19:00 on the weekday; (9) the congestion rates at 13:00 are the highest among the times of a day both in Tokyo and in Ginza whereas the congestion rate at 13:00 is the same as the rate at 19:00 in Setagaya; (10) the highest congestion rates are 38.2 percent observed at 13:00 and 19:00 in Setagaya; (11) the congestion rates vary more among the times of a day in Setagaya than in other zones; (12) the congestion rate in Tokyo is the lowest

among zones and followed by Ginza and by Setagaya at 9:00 on the weekend day; (13) the congestion rate in Tokyo is the highest among zones at 13:00 on the weekend day and followed by Ginza; (14) the congestion rate in Ginza is the highest among zones at 19:00 on the weekend day; and (15) the congestion rate is the highest at 13:00 among the times of a day in all zones.

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