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The Vicissitudes of Local Omnibus Services and Operations in Japan

Oshima Toshihiko

1. Introduction

Japan's omnibus services are on a nationwide scale, and include a variety of forms and characteristics, such as, (1) inter-city highway buses competing with JR's limited express trains (Japan Railways) and airlines, (2) services between railway stations and housing areas in urban zones, (3) routes connecting local cities, and (4) public transportation in rural areas. Passenger density in (1) and (2) is relatively high and the routes tend to be profitable, but for (3) and particularly for (4), there are unprofitable routes with less demand which require subsidies. There is, therefore, a considerable disparity in passenger density and profitability. During the first 50 postwar years there were dramatic vicissitudes in bus services, and trial and error solutions were repeatedly attempted.

In recent years, to tackle omnibus service issues in local areas, municipalities have considered omnibus services from the perspective of resident satisfaction and welfare, and community-buses have been introduced alongside other measures. Bus service operators are thus now actively discussing business plans for the continuation of their companies and strategies for survival after deregulation. When considering omnibus services in local communities, however, many municipalities tend to consider only business plans that take into account currently existing circumstances as influenced by public facility locations, resident questionnaires and workshops, rather than learning from and discussing the very dramatic vicissitudes that have affected omnibus services.

In many cases, scholarly studies of local omnibus services up to date, from respect of human science, have been case studies in the geography, examining relationships between local omnibus services and regional society. More specifically, as part of transport geography, research has been started relatively in an early stage, mainly by Arisue (1953) and Nagasawa (1962・1963・1969)[1) 2)]. In succeeding years, geographic study of omnibus services has been done, after several studies by myself, Oshima (1983・1987・1993[3)]), and recently by Fukutome (1996), Nakamaki (1997・2001), and

Ro (1998)[4) 5) 6)]. In this period, while studies have been done by Watanabe (1978), Oshima (1993) and others[7) 8)], setting bus operation management and regional dominancy conditions as indexes, enough study results were not accumulated.

As a report to illustrate vicissitudes of omnibus industry as a whole, Nihon Bus Association published several books on history of the development[9)]. However, many local omnibus services are mainly operated by private companies and past documents owned by operators are in many forms to clarify historical evidences of each bus operator or basic data of each business operator is not publicized. As for timetables and route maps, which directly indicate operation situations, they are not reserved at resource centers (libraries, archives, etc.), municipalities, or at each bus operator's office, limiting availability of materials on bus operations in the past and becoming a major obstacle.

On the other hand, while descriptions of land transportation in prefectural or municipal history involve many records of businesses which public administrations had direct involvement, such as road systems or bridges, pre-war records of establishment, closing, and acquisition of omnibus businesses tended to lay ubiquitous at operators or areas where the documents were owned.

Organizations of bus operators tended to repeat vicissitudes regionally and within a short period of time, such as elimination and consolidation during wars, and also diversification of operations by company split-ups of bus operators or community-bus operations in recent years. However, accumulation of study results has been scarce, both nationally and in time series. Consequently, I, the author of this paper, have examined vicissitude processes of omnibus services and underlying issues in Gunma Prefecture, where omnibus services declined prominently, studying omnibus services in history of transport[10)].

As just described, discussions of vicissitudes of omnibus services did not develop well, studying mainly regionally and for a period of time, without acknowledging nationwide genealogy enough. In this paper, from a nationwide perspective, I will discuss brief overview of vicissitudes of local omnibus services, which has a long history of repetitive major vicissitudes and especially in recent years with further declining users, has a lot of topics and issues, as community-buses and demand-taxis increase in various places. At the same time, I tried to classify the vicissitudes into several periods.

2. Overviews of vicissitudes of omnibus operation in Japan and the classification into several time periods

Omnibus service in Japan was started in January 1903 (36th year of Meiji era) by Segawa and

other between Yokogawa and Kabe in Hiroshima Prefecture. However, the one started by Nii shokai in Kyoto city on September 20th in the same year is set to be the first according to omnibus business regulations and September 20th is instituted as Bus Day[9]. From then on, reviewing local omnibus operation nationwide, several major transitions in tends can be observed. Though I have already discussed the situations[3], I re-classified the time periods to include recent major transitions in trends, as illustrated in Table 1.

Meanwhile, since detailed vicissitudes, time of transitions of time periods, or degree of vicissitudes slightly vary for each prefecture and also depend largely on each bus operator, in this paper, I will discuss nationwide trends, without focusing too much on individual situations. As basic statistics in doing so, I pulled together nationwide total of numbers of passengers carried per year, of vehicles, of operators, and licensed kilometers, which are major statistical items in bus operation, taking identical criterion of statistical values as long period as possible as shown in Figure 1.

(1) The 1st stage (Dawn period)

After 1903, omnibus services started in various places in Japan, using large-size passenger vehicles. However, despite of the inauguration of businesses, horse carts and Jinrikisha (human-powered carts) are thought to have played major roles in road traffic for a while. This period is considered to be Dawn period for omnibus services. As for omnibus businesses in earlier years, opening, closing, and abolishment of routes occurred frequently in various places, failing to keep stable operations, resulted in many business closures in a short period of time. As for legislation, though automobile regulations were instituted in several prefectures, their contents were almost different. In this period, operating foundations and social orientation of omnibuses were not established yet.

Though it is not clear when omnibus services started to grow stably, from 1910s and to the beginning of 1920s, while the numbers of horse carts and Jinrikisha, human-powered carts, started to decline rapidly, the number of new bus operators and their licensed kilometers surged from about 1918 to 1919. Furthermore, after enactment of automobile laws as a nationwide standard in 1919 (8th year of Taisho era), and also the occurrence of The Great Kanto Earthquake on September 1st, 1923, omnibus market steadily started to grow, as shown in Table 2. From about 1919 to 1923, it can be said that there was a transition to the next prewar developing period.

(2) The 2nd stage (prewar developing period)

Making enactment of automobile laws and occurrence of The Great Kanto Earthquake

Table 1. Classified stages of omnibus businesses in Japan

Classification of stages	Major vicissitudes including management and technology	Trends of major policies, backgrounds, railways, and Japanese economy
The 1st stage (Dawn period) From 1903 to about 1920	・Start of omnibus business (1903) (Many businesses started in this period did not last long.)	・Enactment of automobile regulations in some prefectures ・Light railway law (1911, promotion of local railway construction) ・Enactment of automobile law (1919)
	〔Enactment of automobile law, The Great Kanto Earthquake〕	
The 2nd stage (prewar developing period) From about 1920 to about 1937	・Expansion of bus routes Small-scale operators ↓ Bus operation by railways as subsidiary business Establishment of ministerial and public buses in various places (Establishment of foundation for major bus operators in the present) ↓ Voluntary integration among operators (Decrease in No. of operators)	・Shifting of regulatory power from Ministry of Communications to Ministry of Railways (1928) ・Foundation of Nihon omnibus association (1929) ・Enactment of automobile traffic business law (1933)
	〔Sino-Japanese war to World War II〕	
The 3rd stage (wartime/ restoration period) From about 1937 to about 1951	・Restriction of oil consumption to alternative fuel ・Increase of cancelled routes Acceleration of operator integration (compulsory integration) (End of World War II) ・Improved oil supply condition to revival of the cancelled routes ・Restructuring of wartime integration (Promotion of reintegration and rise of new operators)	・Prohibition of importing foreign cars (1938) ・Issuance of land transport business adjustment law (1938) ・Dissolution of Nihon omnibus association (1941) ・Settlement of integration policy for bus businesses (1942) ・From automobile traffic business law to Road transport law (1947) ・Reestablishment of Nihon omnibus association (1948) ・Enactment of Road transport law, etc. (1951)
	〔Korean War to high economic growth〕	
The 4th stage (postwar developing period) From about 1952 to about 1964	・Rapid development of vehicular technologies (Larger buses, diesel engines, rear engines, etc.) ・Sharp increase of bus passengers and extended bus routes Expansion of bus network throughout the country Increased bus operation frequency and expanded operation hours Battles over bus route licenses Start of long-distance bus operation (on ordinary roads) in various places	・Expansion of living sphere and promotion of municipal mergers ・Enactment of audit law for auto transport businesses etc. (1955) ・Transfer of regulatory power from Minister of Transport to a head of motor vehicle official (1962) ・Closing trend of local private railways in series ・Rise of high-speed transport Opening of Meishin Expressway (1963) Opening of Tokaido Shinkansen (1964) ・Tokyo Olympics (1964)
	〔Affluence resulted from economic growth penetrated to local areas〕	
The 5th stage (decline/ contraction period) From about 1965 to about 1979	・Full-fledged prevalence of private cars and road improvement ・Decrease of bus passengers and worsening of management Increased bus fares due to repeated fare raise Advance of route cancellation Promotion of streamlining (mainly to one-man bus) ・Worsening of traffic jam to difficulty in on-time operation (Reduction in operational efficiency and loss of reliability)	・Full-fledged improvement of road network including expressways ・Surge of labor cost due to active annual spring labor offensive ・Prominent discussions of local line issues of JNR ・Prominent congestion and depopulation in Japan ・Start of measures of Bus priority system Start of Bus subsidy system "Outline of sustaining measures for local bus route operation" (1972) Increase of bus priority/ bus exclusive lanes
	〔Penetration of bus priority system and measures for user convenience〕	
The 6th stage (review/ transition period) From about 1980 to about 1991	↳These negative spirals continued. ・Rapid increase of municipal substitute buses for closed routes (Increase of Article 21 chartered buses from Article 101 private buses) ・Utilization of medium and small buses and second-hand buses from cities ・Search for improvement of services and operation patterns Free getting on-off and demand-buses Bus location indication system, etc. ・Start of highway buses between cities in series	・Time limit for subsidy for the 3rd class daily life routes ・JNR privatization reforms (rehabilitation law) to breakup and privatization Closing of specific regional traffic routes or shifting to the third sector Discontinuation of new construction of local railways Increased frequency of intercity local trains ・Enactment of September 20th as Bus day (1988-) ・Expansion of expressways nationwide ・Stagnation of Japanese economy due to two oil shocks ↓ ・Economic growth with bubble economy
	〔Collapse of bubble economy to priority to environmental welfare〕	
The 7th stage (restructuring/ deregulation period) From about 1992 to the present	・Expansion of highway buses between cities ・Brake to decreasing trend of bus business as a whole (Decreasing of users continued) Rise of community-buses in many municipalities Brake to fare raise (partial introduction of one-coin buses) ・Restructuring and streamlining of businesses and routes Company split-ups by conventional bus operators Rise of new bus operators ・Barrier-free buses Busses with lifts or one-step to non-step bus ・Development and introduction of low-emission vehicles	・Fullness of welfare and environmental policies Barrier-free law Strengthening of environmental measures (emission limit for diesel cars) ・Reorganization of Ministry of Transport and Ministry of Construction into Ministry of Land, Infrastructure and Transport ・Deregulation of bus businesses (for omnibus in 2002) ・Promotion of municipal merger (Big merger of Heisei era) ・100th anniversary for bus operation (2003) ・Establishment of review meeting for bus hijack measures (2000) ・Increase of closed local private railways ・Economic stagnation, restructuring, severe employment situations

This Table is created by the author with references from "Bus business in Japan" (annual publication) by Nihon Bus Association.

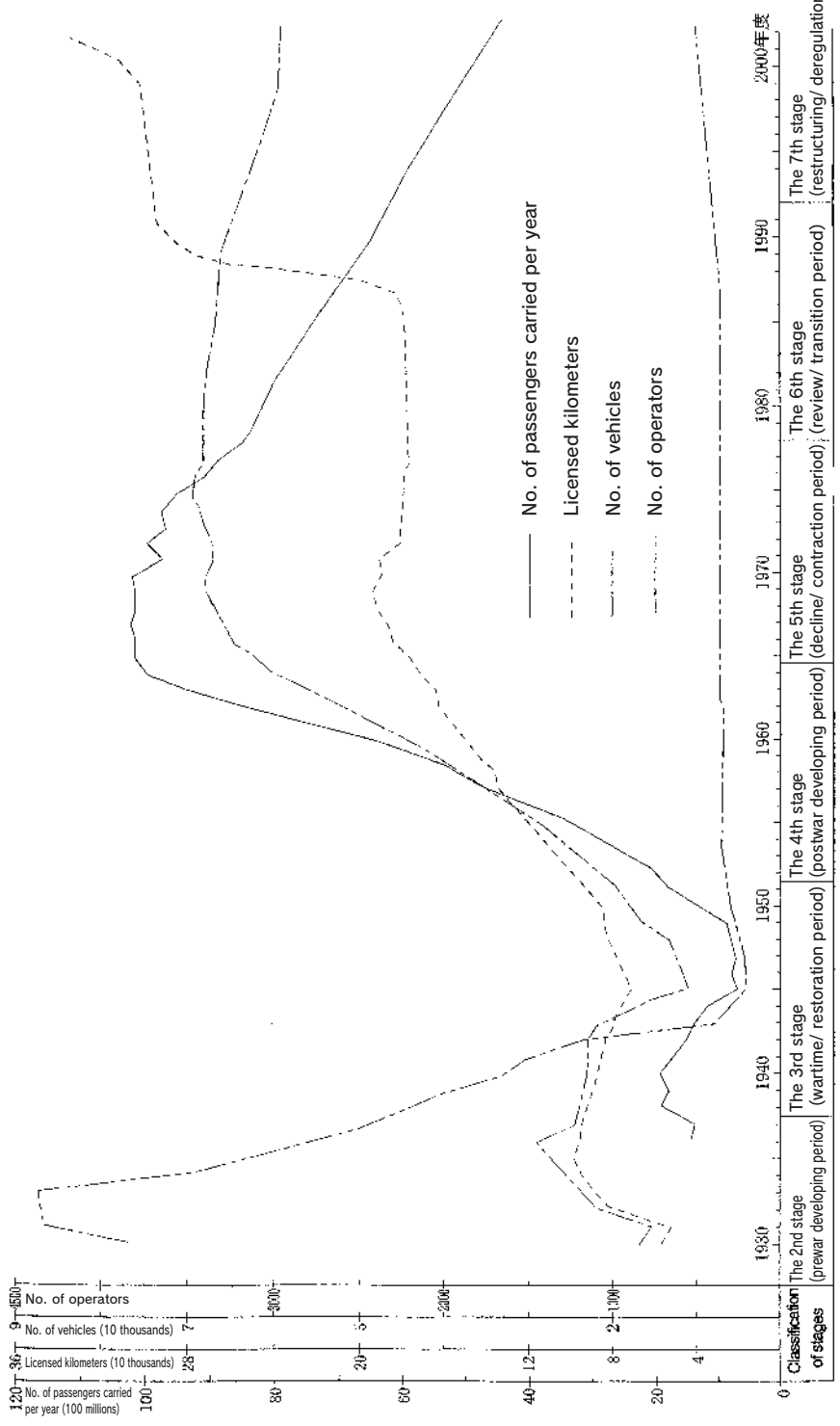

Figure 1. Transitions of bus transportation conditions in Japan
This Figure is created by the author with the following sources
"10 years to a leap forward", p28, Nihon omnibus association, 1963
"Bus business in Japan, Vol. 11", pp. 2-3, Nihon Bus Association, 1971
"Bus business in Japan, Vol. 21", pp. 2-3, Nihon Bus Association, 1982

(September 1st, 1923) as momentum, in this stage (prewar developing period), the use of omnibus services popularized among general public and many bus operators started businesses, resulting in rapid increase of licensed kilometers, the numbers of vehicles, and of passengers carried. As for bus operation in this period, nationwide overview can be grasped from history of the development by Nihon omnibus association[9] and a list of nationwide bus routes for each prefecture and operator as of October 1933[11]. Furthermore, insertion of bus operation to books of municipal history in various places throughout the country increased. After the end stage of Taisho era, as bus operation started to develop indiscriminately with the speed to expel local railways, to defend railways, in 1928 (3rd year of Showa era), power of supervision for automobile transportation was transferred from Ministry of Communications to Ministry of Railways. With this momentum, railway companies (including Ministry of Railways and municipal corporations with railway ownership) started to establish or acquire bus routes which competed with its own railway lines or which operated on neighboring roads. For this reason, many bus operators, which have been in businesses after the war, were established in this period.

After enactment of automobile traffic business law in 1933, opportunities for elimination and consolidation among small and medium businesses were created, halving the number of businesses.

Table 2. Transitions of automobile conditions in Japan in 1910s and in the beginning of 1920s

Year	Total no. of vehicles	No. of new omnibus operators	Increased licensed kilometers by new omnibus operators	No. of horse carts	No. of Jinrikisha
1912	…	3	161.2	8,733	134,232
1913	535	20	325.9	8,581	126,846
1914	761	13	190.3	8,254	118,904
1915	1,316	15	259.7	8,091	115,229
1916	1,557	16	344.8	8,976	112,687
1917	2,116	19	394.8	8,694	113,274
1918	3,856	40	712.1	7,211	113,924
1919	5,272	59	1,141.7	6,827	110,541
1920	7,976	73	1,467.5	6,178	110,405
1921	10,390	91	1,868.0	5,827	106,861
1922	13,070	122	1,929.7	5,463	100,541
1923	16,682	167	3,450.7	4,912	89,149

This Table is created by the author with the following sources
Total no. of vehicles: "History of road traffic with chronology", Keisatujihosha Co., Ltd., 1982
Data for omnibuses: "50-year history of Bus business", Nihon omnibus association, 1957
For horse carts and Jinrikisha: "Modern Japanese transport history - discussion, chronology, statistics", Transport economic research center, 1979

However, since operational scale and the number of passengers carried were still expanding, this could be considered as part of prewar developing period (Figure 1).

(3) The 3rd stage (wartime/ restoration period)

When Sino-Japanese war started in 1937, after October the same year, control of oil consumption was strengthened in stages. This was hard time for whole society during and after the war. At the same time, as a result, this promoted integration of businesses, making small businesses consolidated to neighboring larger businesses or retiring from businesses. Furthermore, in 1942, in a letter ruling from a chief of regulatory office at Ministry of Railways to provincial governors, bus operation integration policy was decided for each prefecture, instructing nearly compulsory elimination and consolidation by core businesses in prefectures or in areas. Over a short period of time by 1945, consolidation of bus businesses was undertaken.

However, in this period from Sino-Japanese war, during the Second World War, and postwar restoration, businesses were further integrated. Furthermore, in postwar restructuring processes, prewar operators were split up again and public bus operators in small and medium cities newly entered into businesses, resulting in establishment and revival of small-scale enterprises in various places. In addition, in 1951, basic laws such as load transport laws were enacted, establishing nationwide foundations for dominance by postwar bus businesses. In this way, this period is significant in vicissitudes of omnibus businesses.

(4) The 4th stage (postwar developing period)

In the course of postwar high economic growth, industry structures were transformed and municipal mergers were undertaken (Big merger of Showa era). In this period, connections between cities and rural communities were strengthened and education continuance rate to high schools grew, surging traffic demand both in volume and in distance. As for omnibus services, in addition to route extension, the numbers of passengers carried and of vehicles, licensed kilometers, frequency of travels jumped and operational hours were expanded. This could be called postwar developing period, as developing period prior to the war can be called prewar developing period.

In the latter part of this period, for each bus operator, more expansion of bus routes was undertaken. Moreover, in 1962, as right of supervision for license for local lines was transferred from the Minister of Transport to an agency head of motor vehicle official, in boundary areas of each bus operator's dominancy, fierce battles over licenses in the areas were taken place (Oshima 2006[12]). During this time, development of technologies for vehicles was significant. In this period, sizes of vehicles became larger, and driving speeds and accommodation were enhanced, while basic

configuration of bus body for the later years was established. Together with road improvement, transportation capacity leaped and long-distance express buses started businesses in various places. On the other hand, many local private railways were closed, with passengers shifting to competitive omnibus services in the same areas with bus operators' business policies to induce passengers' shift to omnibus services, slashing the demand for railways.

(5) The 5th stage (decline/ contraction period)

In this period, the number of passengers carried by local omnibuses shifted to decreasing trend, with many businesses operated at a deficit. At the same time, as a result of streamlining, closing of routes and contraction of businesses progressed in various places (decline/ contraction period). As this background, progressing motorization with prevalence of private cars was a major cause of this decline. Aggravation of traffic jam accompanied by the increased number of private vehicles worsened the operational environment for buses, becoming a major factor for the decline. To cover the increased cost due to the decline of passengers and sharp increase of labor cost accompanied by high economic growth, fare raises and business contraction were repeated. In this period, these adverse elements invited further decline of passengers, repeating the negative spirals. However, at the same time, labor-management issues of bus operators and vicissitudes of social environment and business plans accompanied by streamlining, such as shifting to one-man bus operation, also had large effects. These effects are major issues of my future research.

In the latter part of this period, subsidizing system to secure omnibus services as transportation for daily lives was developed, while in urban areas, bus priority or bus exclusive lanes were allocated. There also were policies to give favorable treatment to omnibus services. In addition, as a result of two oil shocks, there were opportunities to reexamine excessive economic growth and motorization. However, even these could not halt declining passengers and contractive tendency of omnibus market.

(6) The 6th stage (review/ transition period)

Trends of decreasing passengers and of rising fares further continued. For local bus operators, as streamlining by measures such as one-man bus operation reached the limit, promoting elimination by consolidation of business offices, miniaturization of vehicles, and purchasing of second-hand vehicles from major companies in urban areas, expenditure reduction started in this period. In addition, business operators seriously started to search the ways to secure the number of passengers and to enhance quality of transportation services. As part of these efforts, for bus routes in rural depopulated areas, free getting on-off system and melody bus,[13] , were introduced in

some areas and also in urban areas, bus location indicators and guidance systems were introduced, searching for more user-friendly operational forms in various places.

On the other hand, subsidizing system established in the 5th stage was reviewed, in consequence of administrative reforms, mainly for the third class daily life bus routes[14)]. As a result, numbers of omnibus routes were closed for being unprofitable, and became ones substituted by municipalities[15)]. In addition, reforms of the Japanese National Railways with expanded accumulated deficit progressed. In the rehabilitation law within the reforms, closing of JNR's specific regional traffic lines and transfer of some of these lines to the third sector railways were discussed. On the other hand, land transport in local areas other than Shinkansen shifted to road traffic, due to penetration of affluence owing to economic growth thanks to bubble economy, with further development of expressways and of recreational facilities.

(7) The 7th stage (restructuring/ deregulation period)

Due to the collapse of bubble economy, whole Japanese economy experienced a huge transition. At the same time, the number of omnibus passengers also dropped further owing to demand decline accompanied by further economic stagnation and falling birth rate. However, on the other hand, highway buses between cities consistently started businesses and grew to cash-cow routes for each company while competing against JR trains. Moreover, in many cities, to create synergic effects among traffic services, welfare policies, and city community facilities, operation of municipal community-buses started, attracting attentions as a new operational form. Many of these community-buses charge a fixed fare of 100 yen or 200 yen. In local areas, this created dual structures in fares and bus route networks between conventional omnibuses and community-buses.

In addition, to pursue operation efficiency and community-based services for citizens, company split-ups of bus operators for urban areas and neighboring areas and separation of bus operation business for railway companies, subsidizing, proceeded, restructuring bus businesses. Furthermore, as deregulation policies were progressed in various industries, in 2002, deregulation of omnibus businesses was undertaken. As a result, the number of new entry into omnibus businesses is increasing.

In Japan, compared with the West, spread of no-step buses with lower floor height for ease of use for the elderly or for people on wheel chairs was substantially delayed. Major factors for the delay are considered to be because efficiency was given priority in various places in society or in high economic growth and also because road improvement was delayed. However, while in various fields, amid calls for barrier-free environments or for consideration for environment-friendliness,

for bus vehicles, those with lifts and also no-step buses instead of one-step buses became widely used. In addition, in tune with the time with a high regard to environment, as a result of pursuant for low-emission vehicles, environment-friendly no-idling buses and compressed natural gas (CNG) buses were introduced. Moreover, emission control for diesel vehicles in metropolitan area was started (after 2003).

3. Statistical vicissitudes of bus businesses and causes for recent decline of omnibus services in local areas

As described in Chapter 2, after local bus businesses drastically scaled down in the 5th and 6th stages, from the latter part of the 6th stage, together with the development of highway buses and increase of municipal substitute buses for closed routes, after entering into the 7th stage, user-friendliness of omnibus services as a whole improved, with emergence of municipal community-buses in various places in the country. However, not only locally but also nationally, the number of bus passengers continues to decline.

As shown in Figure 1, recent licensed kilometers tend to jump sharply before and after 1990 and after 2000. Before and after 1990, this steep increase seems to be because of growth of highway buses. In addition, after 2000, continued emergences of community-buses[16] is considered to have a large effect. Slight increase in the number of operators in recent years seems to be the effect of company split-ups and deregulation.

The biggest factor for decline in omnibus services in local areas is obviously considered to be development of motorization. Road improvement accompanied by the increase of motorcars led to the expansion of bus routes in the early stage. However, over time, this further promoted decline in omnibus usage and prevalence of private cars. Moreover, traffic jam caused more troubles for on-time bus operation than for private cars, resulting in loss of reliability and worsening of operation efficiency. This caused further deterioration of business conditions for bus operators in local areas, promoting scaling-down and streamlining of businesses as a whole and inviting negative spirals of more decline of number of passengers.

However, in contraction processes of businesses due to declined bus passengers, bus operators and labor unions seemed to have lacked enough eagerness to secure maximum user-friendliness from perspectives of users for a long time, trying to halt decline of bus passengers. More specifically, bus operators tended to give priority to rationalization than to user-friendliness. Moreover, when tackling various issues such as inefficient bus operation, municipalities and community residents had strong tendencies to demand continuation of omnibus services by bus

operators only by utilizing given subsidizing system, without having operators, government, and residents as a whole seriously discussing the way omnibus service should be. Apart from motorization, there are other factors, which promoted decline of omnibus passengers. In addition, on a nationwide scale, modernization and increased speed of various lines of Japanese National Railways by double tracks and electrification, enhanced convenience and services before and after the privatization of JNR occurred when popularity of omnibus services was declining. Furthermore, consequential factors in motorized society such as traffic jam, increased travel time caused by the jam, lack of reliability for punctuality can be other causes. In this way, responses of bus operators and local municipalities, vicissitudes of awareness of community residents for buses, and transformations of related transport facilities such as roads and railways, worked negatively for the continuation and development of omnibus services. This cannot be missed to be mentioned and these negative factors had stronger effects in local areas.

4. Conclusion

In this study, I overviewed vicissitudes of omnibus services in Japan, mainly in local areas. In Chapter 2, I classified the vicissitudes into several stages for the discussion. In Chapter 3, I discussed decline of usages and factors for the decline since the latter part of 1960s, indicating the relationships with statistical vicissitudes. In this paper, I overviewed vicissitude trends in omnibus services in Japan up to date, which I have been studying as a major theme of my study all the while, and underlying factors for the decline of bus usages which are the major issues for omnibus services in Japan at present. Furthermore, I think factors for the decline of local omnibus services other than development of motorization, described in the latter part of Chapter 3, are important. I would like to investigate these factors further from this forward.

(Professor, the Faculty of Economics, Takasaki City University of Economics)

References and notes

1) Arisue Takeo (1953) : Bus Service in the Izu Peninsula, Geographical Review of Japan, 26-11, pp.486-493
Arisue Takeo (1954) : On the Bus Service in Winter in the Regions along the Japan Sea Coast, Geographical Review of Japan, 27-12, pp.518-527
2) Nagasawa Hideya (1962) : Bus Traffic mainly around Shizuoka City, Educational Geography, 5-8, pp.2-9
Nagasawa Hideya (1963) : Bus Traffic in the Kofu Basin, Educational geography , 6-8, pp.2-11
Nagasawa Hideya (1969) : Transitions of Bus Traffic mainly around Shizuoka City, Regional Studies,Vol.12,pp.44-49
3) Oshima Toshihiko (1983) : Transitions of Bus-Networks in Gunma Prefecture, The New Geography,31-2,pp.1-24
Oshima Toshihiko (1987) : Recent Conditions of Bus Traffic in Gunma Prefecture, Group Magazine for the 61st year of Showa era (Gunma prefecture high school education study group, geography section),

Vol. 17, pp.11-18
Oshima Toshihiko (1987) : "Regional Study of Bus Traffic", Gunma National College of Technology,93P
4) Fukutome Kunihiro (1996) : Conservation of Public Transportation in the Rural Depopulated Region －A Case Study in Chichibu,Saitama Prefecture,The Journal of Geography,No.50, pp.79-98
5) Nakamaki Takashi (1997) : Response of Inhabitants after Discontinuance of the Local Bus Line Service in Matsuida-Machi, Gunma Prefecture, The New Geography, 45-2, pp.20-34
Nakamaki Takashi (2001) : Transitions on Ordinary and Substitute Bus Businesses and Bus Route Networks in the Southwestern part of Gunma Prefecture, Regional Studies,Vol.42, pp.27-37
6) Seong Soo Ro (1998) : The Present Condition and Problem of the Bus Transportation, The Library of Geography (The association of geographers in Nihon university), 39-2, pp.12-27
7) Watanabe Susumu (1978) : The Regional Formation of the Bus Transportation Business in Japan, Annals of the Association of Economic Geographers,24-3, pp.45-64
8) Oshima Toshihiko (1991) : The Regional Character of Bus-Business through the Foundation and Development, KOTSUSHI KENKYU,No.26,pp.78-89
9) Ogawa Kenjirou (1937) : "10-year History of Nihon Omnibus Association", Nihon Omnibus Association, 714P
Nihon Omnibus Association (1957) : "50-year History of Bus Business, abbreviated Chronologic Table", 82P
Nihon Omnibus Association (1957) : "50-year History of Bus Business", 1174P
Nihon Bus Association (2003) : "Commemorative Issue for the 100th Anniversary of Bus Business", 80P
10) Oshima Toshihiko (2002) : "Vicissitudes of Omnibus Services and Regional Society in Gunma Prefecture －The Subject on Tobu Bus after the World War II－", Company of Jomo Shinbun, 184P
11) Ministry of Railways (1934) "Comprehensive list of omnibuses in Japan", Railway koron-sha
12) Oshima Toshihiko (2006) : A Study for the Vicissitude of the Omnibus concerned with the Traffic condition in 1950's～60's －A Case Study in the south region at the foot of Mt.Akagi along the Jomodentetu-Railway in Gunma Prefecture－,Journal of Historical Studies in Civil Engineering, Vol.25, pp.63-73
13) This bus operates while playing designated melody, notifying the approaching of the bus to residents along the route. It has large effects, such that residents can leave their houses after hearing the melody, etc.. Melody bus usually employees free getting on-off system at the same time.
14) It is decided by public treasury's subsidizing system for omnibus for routes with average boarding density of less than 5 passengers. Since fiscal year 1982, it is a subject for a limited subsidy for 3 years. It is a timed system to promote to shift to municipal substitute buses for closed routes or to abolish. Meanwhile, routes with average boarding density between 5 to 15 passengers with operation frequency of 10 times per day is called Second-class daily life route. Routes with average boarding density of more than 15 passengers is called First-class daily life route. Since First-class daily life routes are usually profitable, there is no need for subsidy. In fiscal year 2003, subsidizing system was revised, so that this name is no longer in use.
15) There are two kinds. One is directly operated by municipalities by means of private vehicles. Common name for this bus is 80-jo bus, since it is specified in Article 80 of road transport laws. Another is operated by bus operators chartered by municipalities, usually called 21-jo bus, in Article 21.
16) Many of community-buses go rounds in cities all over, substantially increasing route length. Some are operated with licenses for chartered buses, but those operated with licenses for omnibus are increasing.