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A SUSTAINABLE SOLUTION FOR TOKYO BY A PRIVATE RAILWAY

1. BIOGRAPHICAL NOTE

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2. ABSTRACT

The aim of this paper is to demonstrate a role of a private railway company, Tokyu Corporation, in Tokyo, which led it to a sustainable structure at a metropolitan scale. It is widely discussed that promoting energy efficiency of the mobility in a large city like Tokyo is one of the most important policy issues, since a solution against global warming is necessary to sustain the current level of environment for future generations. It also is important to sustain the economic strength. Tokyo is a city where private companies have managed and operated railways as an essential infrastructure, and developed around them. In this paper, first, historical background of the growth of Tokyo and Tokyu Corporation is described. This accompanied outward encroachment of the built-up area, underpinned by substantial migration to Tokyo from the other part of Japan. Secondly, current situations and political issues are mentioned. Towards the forthcoming "matured" society, planning and transport paradigm should be shifted from developing green fields to regenerating the built-up area. As a successful case study by Tokyu Corporation, the renewal project of Setagaya Line is introduced. Thirdly, as conclusions, strategies to give solutions for the sustainable issues are discussed. From the context mentioned, evidently, it is important to build new frameworks of the partnership among public, private, etc.

3. FULL TEXT

1. Introduction

Environmental issues at a global scale are widely discussed nowadays. Since green house gas emission is seen as the major reason of the global warming, reduction of it is one of the major political agendas of urban/regional planning. From a transport point of view, it is important to encourage people to use public transport. For example, the White Paper of MLIT Japan (2002) noted that energy consumption per passenger kilometer of private car is almost ten times of that of railways. Per capita energy consumption is strongly correlated with urban density; i.e. efficient Asian cities with high density and inefficient ones in US counterparts (Newman and Kenworthy 1989). It is likely that Asian cities, including Tokyo, have a structural characteristic to use public transport, especially railways, to great extent.

At the same time, Tokyo is a "World City" where high order functions, such as headquarters of multi-national firms, are concentrated, as well as New York and London (Sassen 1991). Railways are one of the most important infrastructures for people and economic activities in the World Cities, as they are reliable, predictable and quick, compared with cars. They also can cope with a large scale commuting flows with radial directions, generated by a land use pattern that business activities are concentrated in the center, surrounded by residential areas. However, it is discussed that the level of services of railways in Tokyo is not sufficient enough to sustain its status as a "World City" (Ieda et al 2001). It is implied that railways should be further improved to promote the environmental and economic sustainability of Tokyo towards the future.

The aim of this paper is to demonstrate a role of a private railway company, Tokyu Corporation, in Tokyo, which led it to a sustainable structure at a metropolitan scale. The

main field of Tokyu is the south-western part of Tokyo within approximately 30miles radius from the center. The paper is composed of four parts. After the introduction as the first part, historical background of the growth of Tokyo and Tokyu Corporation is described in the second part. It is strongly supported by migration into Tokyo and outward movement of the built-up area. Thirdly, current situation and political issues are mentioned. Towards the forthcoming "matured" society, planning and transport paradigm should be shifted from developing green field to regenerating the built-up areas. As a successful case study, Setagaya Line renewal is introduced. Finally, as concluding remarks, strategies to give solutions for the sustainable issues are discussed. The gist is that it is increasingly important to build a framework of the partnership among public, private, etc. Finally, on the basis of the discussion, concluding remarks are mentioned.

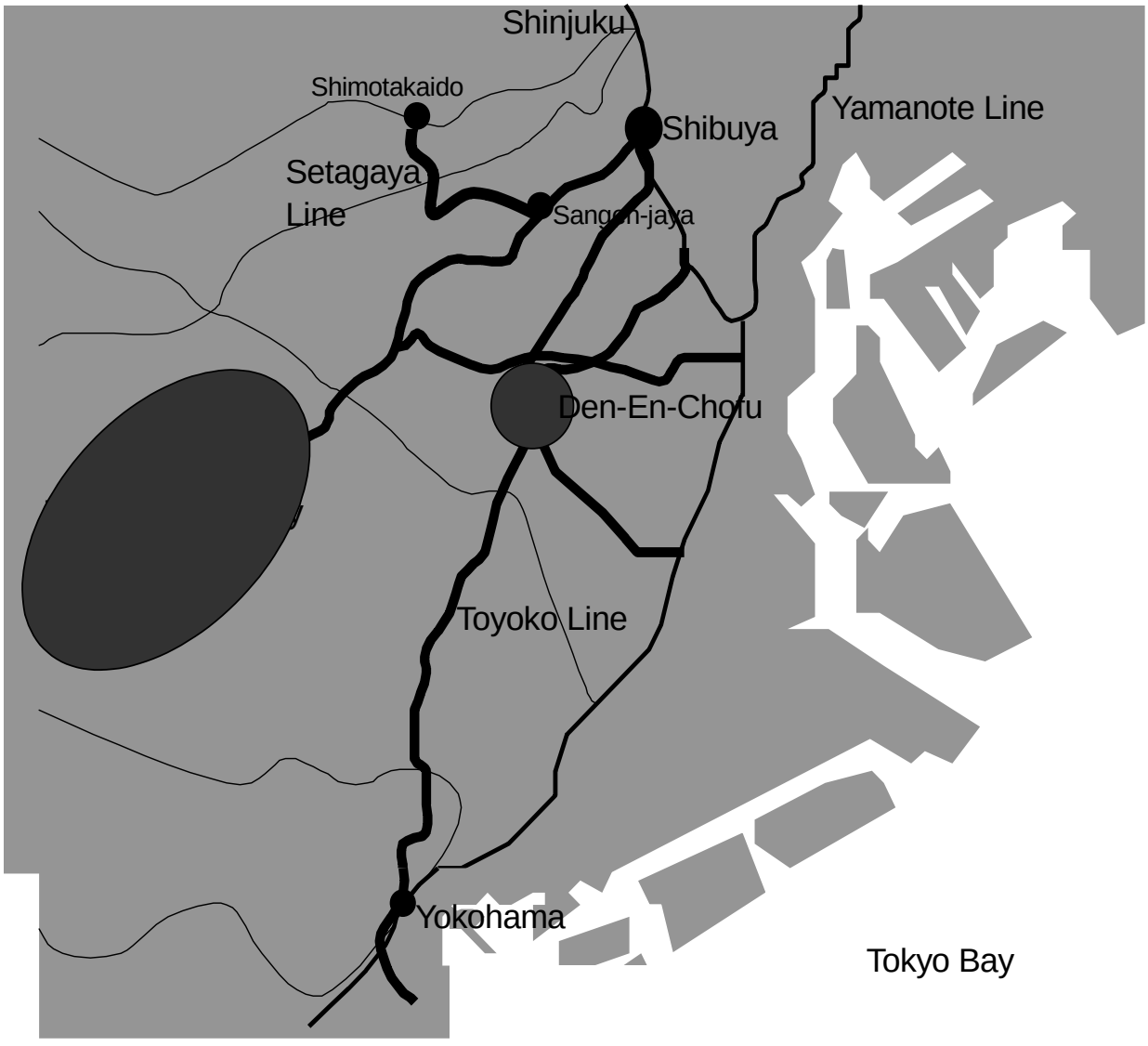
2. Historical Background: Outward Expansion of Tokyo's Built-up Area

Throughout the rapid economic growth era since the beginning of 20th century, Tokyo has grown significantly. The population of the Tokyo Metropolitan Area increased by threefold from 11 million in 1930 to 33 million in 2000. As a result of considerable migration from the other part of Japan to the metropolitan region of Tokyo, the built-up area has expanded by encroaching the surrounding green field. In addition, the Great Kanto Earthquake that took place in 1923 accelerated the trend of the outward movement, as people's perception against security and safety was significantly promoted by the disaster. Growth of business by private railway companies coincides with the trend. In the 1920s, Eiich Shibusawa, an entrepreneur, started business of the suburban "New Town". He started the Garden City Company, the predecessor of Tokyu Corporation, built a new railway, called "Mekama Line", and developed residential areas with high quality of environment in the south-western suburbs of Tokyo around the area called "Den-En-Chofu". In fact, he imitated the concept of the "Garden City" of Ebeneser Howard in the end of the 19th century (Howard 1898). The difference between them is that the "self-containment" is the key item of Howard's Garden City, whereas Shibusawa provided residential areas and connected them with the center by railways. Since then, the New Towns in the suburban Tokyo have been developed basically under the concept of Shibusawa, i.e. seeking high quality of living environment and connecting them with the business agglomeration in the center and sub-centres by high speed/frequency railways. It means that the New Towns in Tokyo are dormitory towns.

Tokyo also tried to imitate the Green Belt, another planning tool from Europe, introduced in the Greater London Plan in 1944. The plan applied the Green Belt around the built-up area in order to halt the piecemeal outward encroachment (Hall 1973). In it, new property developments are strictly checked. The Green Belt policy was tried to apply in Tokyo in "The Basic Plan of the National Capital Region" in 1956 (Hall 1984), but was unsuccessful mainly because of strong pressure of the population growth. Recognising that the trend of growing Tokyo at a metropolitan scale as a business chance, Keita Goto, then president of Tokyu Corporation, started another "Garden City" development in the 1950s in the area further out from the previous one in the 1920s. Called "Tama Garden City", the development scale is much larger with approximately 5000 hectare. It is also a dormitory town with pleasant living environment, which is connected by a newly built railway line to the centre.

Tokyu Corporation has undertaken other kinds of development, such as commerce, business, amusement, culture, and information, as well as residential areas and railways. In general, a network characteristic of railways in Tokyo is that radial lines from suburbs are concentrated to the terminals on an orbital line, Yamanote Line, in the fringe of the center. Towns around the terminals, such as Shinjuku, Ikebukuro and Shibuya on Yamanote Line are called “sub-centres”. The attitude towards property development of Private railway companies was to create new demand for railways by newly provided floorspace, as well as to gain profit from the development projects themselves. This was an attempt to internalise external impact.

Fig 1 The Territory of Tokyu Corporation



For example, Tokyu Corporation started department stores in Shibuya in the 1930s, the terminal from “Tama Garden City” as hinterland. Investment by private railway companies in the sub-centres induced other business chances, and consequently, shopping and amusement agglomerations are formed by large-scale developments and small businesses. In the 1960s, it was typical life style of middle class people in Tokyo to live in suburbs, commute to the center by railway and go out for shopping, etc. to department stores in the sub-centres by railways.

To sum up, the role of private railway companies in Tokyo is to meet the growing demand as a metropolis by building railway lines and undertaking property development, including New Towns and shopping agglomerations. It was contemplated that railways are the key transport mode to sustain the urban structure and that the developments embrace functions to maximize railway users. Therefore, a feature of Tokyo is that private railway companies have played a major role in creating the railway-oriented urban structure at a metropolitan scale (Fig 1). Especially Tokyu Corporation has taken initiative by succeeding the achievement of Shibusawa and Goto in the south-western part of Tokyo.

3. Current Situations: A Case Study of Setagaya Line Regeneration

In the early 1990s, the so-called “bubble economy” of Japan was ended. In conjunction with the slow-down of stock and property market, population growth of Tokyo decreased as a result of stabilized in-migration. In addition, it is predicted that total population of Japan will decrease from 2010 towards the future. Forthcoming ageing society is evident, because of the low birth-rate. Thus, we need to change the paradigm in making decision and undertaking various matters in terms of railway management/operation, property development etc. regarding private railway business, towards the “matured” economy and society.

In addition, as shown in the discussion of the Earth Summit and so on, it is environmental issues at a global scale that should be tackled with a high priority. From a point of view of global environment, “sustainable development” is a key word in discussing policy issues on transport and urban/regional planning. Cities should have a structure, which minimizes energy consumption, in order to prevent global warming. It is extremely important to encourage people to use public transport, instead of cars, which are inefficient in the green house gas emission. At the same time, it also is important to make investment to regenerate the built-up area to greater extent than develop green-field sites, because of low growth pressure.

From such as context, it is worth introducing regenerating project of “Setagaya Line”, a tram line operated by Tokyu Corporation in Setagaya area, situated in the densely built-up central fringe of Tokyo. Its operation was started in 1925 as a branch line of “Tamagawa Line” which directly connected to Shibuya, a sub-centre. Although initially, the demand for it grew along with the outward growth of Tokyo in the 1920s, it had become obsolete to meet the requirement to carry a large number of passengers from suburbs to the centre, as a result of “Tama Garden City” development further out, mentioned above. At the same time, increased

car ownership brought about deficiency of road capacity. Taking into account such situations of a growing city, it was decided that the trunk part of Tamagawa Line was abolished and replaced by a high-speed underground railway, “New Tamagawa Line”. The number of stations between Shibuya and Tamagawa was decreased from 16 to 5. Despite the abolishment of the trunk part in 1969, the branch part with three miles and ten stations between Sangenchaya and Shimotakaido remained as “Setagaya Line”.

There was a view that the branch part would be abolished soon in the 1970s, but the reality was different. Although there were some ups and downs because of factors like economic situation, the number of passengers has been stable around 50 thousands a day. From a point of view of reliability and predictability, the level of services of Setagaya Line is not low, compared with cars, which are suffered much by notorious traffic jams. The problem was that equipment, such as rolling stock and stations, were considerably old-fashioned and obsolete. Notable ones were with no air-conditioning even in the mid-summer and two high steps (35 centimetres each) at doors. In order to sustain Setagaya Line towards future generations, planning task force to regenerate it was organized in Tokyu Corporation in the mid-1990s, and started discussion.

The focal point was how to promote the level of services, including the “barrier free” for elderly and handicapped, and to attain operational efficiency. It was seen most effective to undertake a comprehensive renewal work. In order to eliminate the steps between rolling stocks and platforms, floor level of new rolling stocks were designed 30 centimetres lower than old ones. At the same time, the level of platforms was raised by 40 centimetres that eliminated the 70 centimetres gap. In order to build slopes for wheelchairs at an end of platforms, the length of rolling stocks were to shorten from 28 to 24 metres. Their width was increased from 2.3 to 2.5 metres to keep the same level of capacity. Another option; i.e. to replace old rolling stocks to low-floor LRT, which was a new technology and had already been in some European cities, was not adopted because demerits of high cost and operational risks were strongly perceived then.

A characteristic of this project is that investment; $30 million, was concentrated mainly within two years from 1999 to 2000, relatively short period. This enabled minimize inefficiency and maximized the level of customer satisfaction. The annual number of passengers in 2001 was increased by 1.5% from 2000.

Since Setagaya Line looks like a tram with human scale equipment and facilities, passengers and people living around the line feel strong intimacy. Towards the strict business environment of the future railways, clearly, it is very important to promote the intimacy to sustain the number of passengers and status of railways including Setagaya Line. From such a point of view, Tokyu Corporation started planting flower in the vacant lands beside the tracks. The people who are committed called the activity “flowering”. The kinds of the flower are designed under a principle; i.e. all-season style between stations and theme color at stations. Twice a year in spring and autumn, volunteers from employees of Tokyu Corporation and surrounding communities hold “flowering” events. That in autumn is in

coincident with the Setagaya Line festival mainly by shopkeepers on streets. It is now widely discussed how to promote the synergy between Setagaya Line and the town planning through the “flowering” activity.

Furthermore, contactless IC cards, called “Setamaru” were introduced in July 2002. Passengers can ride trains by just lightly touching the read-and write device, installed beside entrance doors of each cars. If used in off-peak hours like daytimes and holidays, fare discount points are recorded on memory tips. This point system is an incentive to use the services during off-peak hours. Surely, “Setamaru” has significantly improved the level of services of Setagaya Line. As well as a rail ticket, IC cards have a possibility as an effective tool to bridge between railway and surrounding community, if the large memory of the Integrated Circuit function is properly devised.

4. Concluding Remarks: Towards Sustainable Tokyo by Public Private Partnership

It is clear that railways are indispensable infrastructure for the sustainable development of Tokyo. At the same time, it is assumed that private railways play one of the key roles to underpin it because historically, they have taken an initiative in creating railway-oriented urban structure and dispersal pattern of population and employment. Nevertheless, this sustainable characteristic has gradually diminished as a result of expanded car ownership. It is convenient for those to use car in some situations, compared with using public transport including railways, although there used to be a typical life style in Tokyo to use railways in radial directions to visit shopping and amusement agglomeration situated in the sub-centres, developed by private railway companies.

In order to sustain the environmental quality, it is essential to encourage people to use public transport to greater extent by regenerating the built-up areas. That is to promote the attractiveness around railway stations by facilitating high-density property development and providing more open space. At the same time, it is also important to improve the level of services of railways themselves by building more efficient network. Although this kind of investment has basically made by railway companies, it has become more difficult nowadays, since they recognize large-scale investment risky towards low growth era in the future. Relieving the debt risk brought about by investment is an incentive to attract private firms into the projects of building new lines and property development.

From this context, in order to build new lines for network efficiency, it is clear that adopting “vertically separated” organizations is effective. This is to shift the organisational structure from territorially independent one which used to be general in Japanese large cities like Tokyo. The vertically separated system is ubiquitous in European countries like Railtrack and operators, after the privatisation of the British Rail. There is a possibility that this will be a solution for the sustainable development of Tokyo by efficient public-private partnership, if lessons from European predecessors are properly referred.

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