Effects of Double Tracked Planning Approach for Urban Regeneration - Structural Reforming and Functional Renovation

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Abstract

The aim of this paper is to verify the achievement of the specific planning approaches relating to urban regeneration which applied in Greater Tokyo Metropolitan Region in Japan since the late 1980s. The subjects are two different planning approaches which are 1) Structural Reforming Approach on Mega Scaled Metropolitan and 2) Functional Renovation Approach on Inner Wards Area. These two policies were implemented during same period, and seemingly somewhat contradictory. The former approach intends to mitigate murderously overcrowding condition of commuter trains at that time by the measure of developing some new business core districts in dispersed locations at approximately 30 kilometres away from the concentrated central business district. This approach was based on mega regional spatial perspective on 50 to 60 kilometres radius scale with more than 30 million of population. The latter approach intends to increase total office floor area to more than double in the Inner Area of the Region by means of land use conversion of large vacant sites such as former factories, railway yards or port storages for the purpose of real demand and strengthen global competitiveness of national economy. The author verified these two planning approaches by mainly comparison of 1985 and 2005, which means before and after, and found that each aim of two planning approaches has been mostly achieved so far, though they were seemingly contradictory, and analyzed that the performances are largely depended on prominently increased traffic capacity of railway network during the two decades and valued spatial design and diverse facilities which regenerate the sites as attractive places to the city.

Keywords: urban regeneration, mega city, spatial planning, grater tokyo metropolitan region, minato-mirai,

1. Scope and backgrounds

The aim of this paper is to verify the achievement of the specific planning approaches relating to urban regeneration which applied on Grater Tokyo Metropolitan Region since late 1980s. The subjects consist of following two issues; 1) Structural Reforming of Mega Scaled Metropolitan Region, and 2) Functional Renovation of Inner Wards Area.

Grater Tokyo Metropolitan Region is the spatial area of mega scaled and consecutive urbanized which size is more than 40 to 50 kilometres radius, and with population of more than 30 million people. Not only huge in size, the region is playing functional role as to lead whole economy of the country because leading industries, headquarters of large companies and trade and financial centres are accumulated inside.

However, several kinds of problems suffered the region at the same time during late 1980s to early 2000s. One of the problems was murderously overcrowded commuter trains with long distance and hours, although the region had equipped densely developed railway network with every three minutes frequency and incredible punctual operations. Another problem was industrial hollowing out especially on manufacturing factories. But on the contrary, demand of advanced office buildings went on to be intensive at the same time because financial businesses and IT industries were occurred and grew due to rapid globalization of economy.

At last, those problems required strategic approach of urban regeneration, especially by two different approaches. They are supposed to be said that 1) Structural Reforming Approach for mitigating problems caused by expanded mega scaled region and 2) Functional Renovation Approach for required demands in inner area.

Structural Reforming Approach means to change the regional land use pattern from one concentrated CBD to having dispersed several Sub CBDs or multiple business core districts in regional wide spatial scale such as 30 to 40 kilometres radius size. In order to achieve the objective, new large business core districts should be developed located at about 30 kilometres away from the central Tokyo. The aims of the policy were mainly to mitigate the extreme overcrowding condition of commuter trains and to create new regional core districts as attractive places.

Functional Renovation Approach means mainly promoting land use conversion of large vacant sites such as former factory sites, former railway yards and former harbour sites where are abandoned despite of advantageous location that neighbour to central districts, as well as redevelopment projects. Spatial scale of this policy corresponds to approximately within 10 kilometres radius from the centre of CBD. The aims of the policy were to supply excellent office floor and housings to obtain global competitive power to the city. Most of the projects were carried out by private sector.

Above two planning approach were formed and implemented at the same age of the late 1980s, but they are seemingly contradictory to each other in terms of their purposes. About two decades have passed since then, do they achieved the objectives?

2. Purpose and methods

The purpose of the study is to verify the two different planning approaches which were formed and implemented since the late 1980s in order to resolve the fundamental problems relating to urban land use, in terms of making it clear what has achieved and what are the sub effects, and seeking to the possibility of double tracked planning approach like this.

The method of verification is mainly comparing statistic data between 1985 and 2005, which means before and after the implementations.

There are not so much earlier theses on this subject. Nishimura (1991) estimated the impacts on number of office relocation from central area to outside area in Grater Tokyo Metropolitan Region in terms of assumed implementation of some policies such as down zoning. Akimoto (1990) analyzed commuting flow towards the Business Core Cities in the Region. However, both of them did not refer the effects and attainments of the planning approaches which actually implemented.

3. Structural reforming approach of mega-scaled metropolitan region

3.1 Problems and proposed solution

The illustrations of Figure 1 were quotation from a plan called the National Capital Region Reforming Plan in 1986 by National Land Agency of Government. It describes the concept of structural reforming of Greater Metropolitan Region of Tokyo. The scope of the illustration in terms of area and distance corresponds to approximately 60 to 100 kilometres in radius around central area of Tokyo.

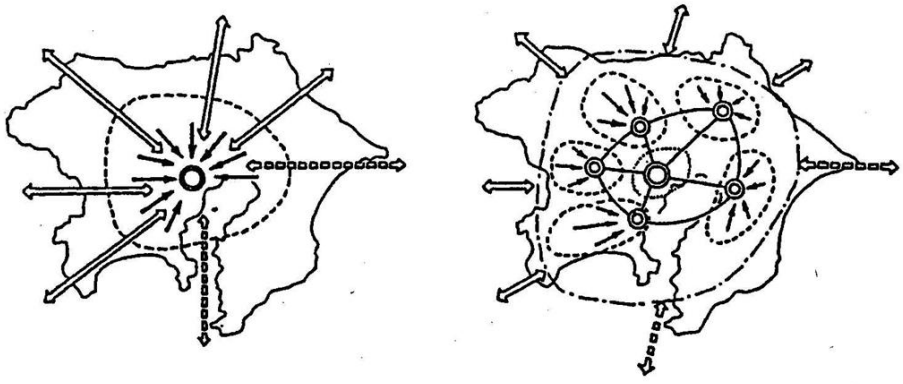

Figure 1: Concept of “One Polar Concentrated Structure” and “Multi Core and Multi Regional Structure” (Source; the National Capital Region Reforming Plan, 1986)

The picture on the left conceptually describes the current situation that is regional structure with one and only strong business centre so that most of the commuter traffics are inevitably concentrated toward the centre. Next, the picture on the right describes a desirable situation that should be achieved by the plan in the future, which has some sub centres distributed around the existing centres from distance of 30 to 40 kilometres away so that traffics could be dispersed toward sub centres and trip length are to be shortened. If these sub centres would be grown to be strong enough as independent regional cores, the mega region would be divided into several independent sub regions. In the plan, the left pattern was called as “One Polar Concentrated Structure” and the right was called as “Multi Core and Multi Regional Structure”.

As unique characteristics on Grater Tokyo Metropolitan Region, most of the commuter traffics depend on railway services, though the region is so huge. In fact, more than 90% of total commuter trips to the Inner 23 Wards area from the outside area are by trains (person trip survey 1998). This modal sprit is supposed to be inevitable due to its huge population, which is more than 30 million people lives in the consecutive urban area and approximately 3 million people are travelling every morning to the central area from 20 to 50 kilometres away. It is supposed that only railway services can deal with such huge amount of commuters. However, there’s a fundamental problem in terms of spatial planning and infrastructure development.

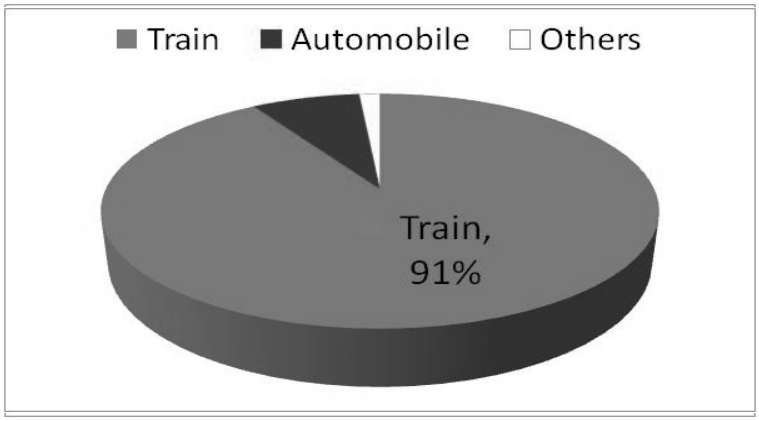

Figure 2: Modal Sprit of Commuters toward 23 Ward from the outside (Data; Person Trip Survey, 1998)

Thus, the most serious problem in terms of regional planning is considered the imbalanced one direction flow of commuter trips that causes the murderous overcrowding. According to the National Census (Figure 3), approximately 3 million passengers go into the Inner 23 Wards area every morning, but about 0.4 million passengers go out of the Inner 23 wards area. That means the inside direction trains are terribly overcrowding while the outside directions are almost empty. This imbalanced situation should be recognized as inefficient use of railway infrastructures. Moreover, long distance commuting was also recognized as serious problem. The problem seemed inevitable, but the plan proposed that it should be mitigated thorough reforming land use pattern of the region. The proposal was based on the idea that the commuter trips are generated by work places which are the

destination so that the problem on congestion can be solved if the locations of destination would be dispersed.

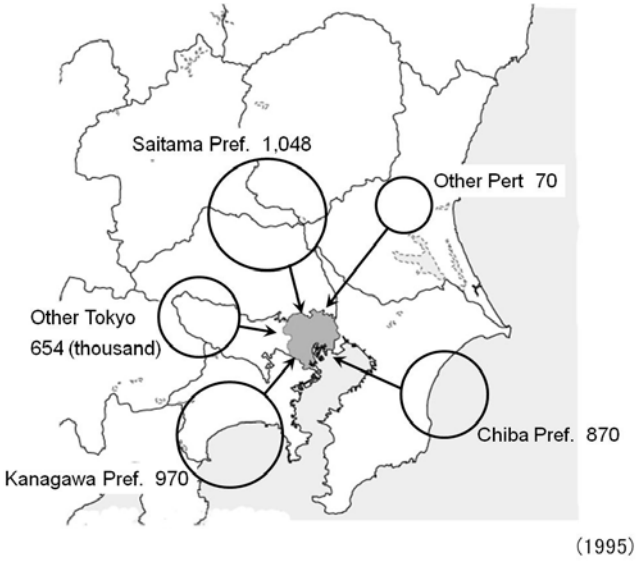

Figure 3: Population of Commuters toward 23 Ward from the outside (Data; National Census, 1995)

Therefore, changing the regional land use was considered as fundamental solution as planning approach, and the most effective surgery would be to construct office accumulation districts and to relocate and disperse business work forces from the centre. Based on the idea that the 1986 plan proposed, Prime Minister designated several specific cities as the Business Core Cities in 1989, to promote the “Multi Core Multi Regional Structure”.

3.2 Three major urban development projects

Corresponding to the designation, three major urban development projects such as Minato-Mirai district in Yokohama City, Makuhari New Centre district in Chiba City and Saitama New Centre district in Saitama City were started. These projects are located around approximately 30 kilometres from the central district of Tokyo, and recognized as the strategic projects which realize the “Multi Core and Multi Regional Structure”

As reference to Table 1 and Figure 4, Minato-Mirai district in Yokohama City is located approximately 30 kilometres south from central Tokyo, neighbouring to traditional business district, with area of 186 hector. It is water fronted site in the midst of the port, which include former dry docks and reclaimed land. Future work force population was estimated 190 thousand. Other than office for business, large shopping facilities, deluxe hotels, hospital, museum, amusement park and some residential skyscrapers are to be constructed.

Makuhari New Centre district in Chiba City is located approximately 30 kilometre west from central Tokyo with area of 110 hector. It is located in huge reclaimed land in front of Tokyo Bay, next to large housing complex development site which is famous by experimental townscape design process. There are huge exhibition hall (messe), baseball stadium, shopping malls and several hotel buildings other than office buildings. Future work force population was estimated 150 thousand.

Saitama new Centre district in Saitama City is located approximately 30 kilometre north from central Tokyo with area of 47 hector. This development site was mostly former railway truck yard. Unique characteristics of this development are that the office buildings are largely occupied by the National Government's branches for regional services. A square plaza on the deck with planted high rise trees and multipurpose arena with 37 thousand seats at most are located. Future work force population was estimated 57 thousand.

Table 1: Three Major Urban Development Projects in Business Core Cities (Data; Each City Gov.)

District / *Type*	*Minato-Mirai*	*Makuhari New Centre*	*Saitama New Centre*
City	*Yokohama*	*Chiba*	*Saitama*
Development Body	*Urban Renaissance Agency & City Gov.*	*Prefectural Gov.*	*Urban Renaissance Agency & Prefectural Gov.*
Area of Development	*186 ha*	*522 ha*	*47 ha*
Former Use	*Dock, Railway Yard &Reclaimed Land*	*Reclaimed Land*	*Railway Yard*
Target Work Force Population	*190,000*	*150,000*	*57,000*
(Attainment in 2009)	*63,000*	*49,000*	*18,000*
Target Residential Population	*10,000*	*26,000*	*None*

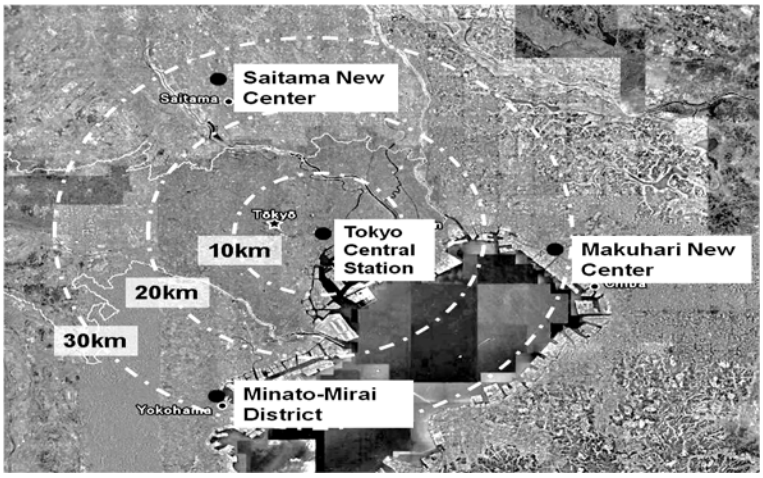

Figure 4: Locations of Three Major Urban Development Projects (Picture; Google Map)

3.3 Verification

3.3.1 Viewpoints

The aimed effects are as followings;

1. To mitigate the murderous overcrowding situation of commuter trains

2. To create attractive sub centre districts for the sub regions

Therefore, verification should be done from these viewpoints.

3.3.2 Attainments

Figure 5 shows crowding rate of trains and total number of passengers of Greater Tokyo Metropolitan Region from 1985 to 2005. Crowding rate means dividing number of passengers in morning peak hour to regular capacity and the figure is average rate of major 31 railway lines. In 1985 when before the plan stated, overcrowding rate was 212%, which means more terrible condition than all the passenger's body touches each other and feels considerable pressure. The terrible condition has been mitigated to 176% in 2005, which means the condition that passengers are able to read newspaper if it is folded. However, it should be taken note that the total number of train passengers in whole region was increased by 24% during two decades.

Figure 6 shows number of commuters that move into and go out from the 23 Wards area, Inner Tokyo, and their transition. Approximately 3.5 million commuters (1995) moved into Inner Tokyo from surrounding prefectures every morning, and the imbalanced situation by approximately eight to one. However, we should pay attention that the number of move into Inner Tokyo is decreased obviously in 2005.

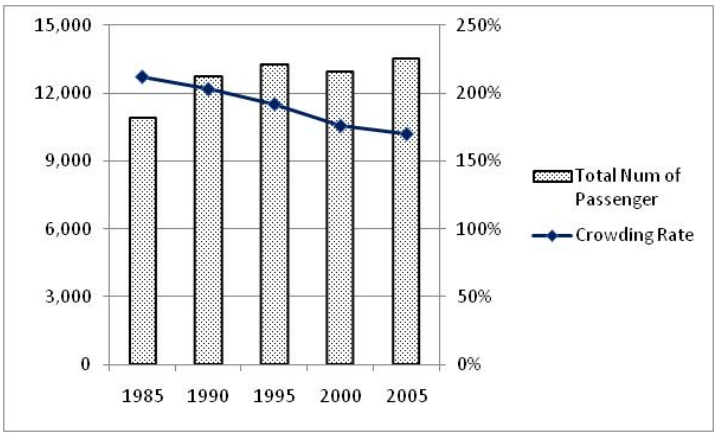

Figure 5: Total Number of Train Passengers and Crowding Rates (Data; Railway Bureau MLIT)

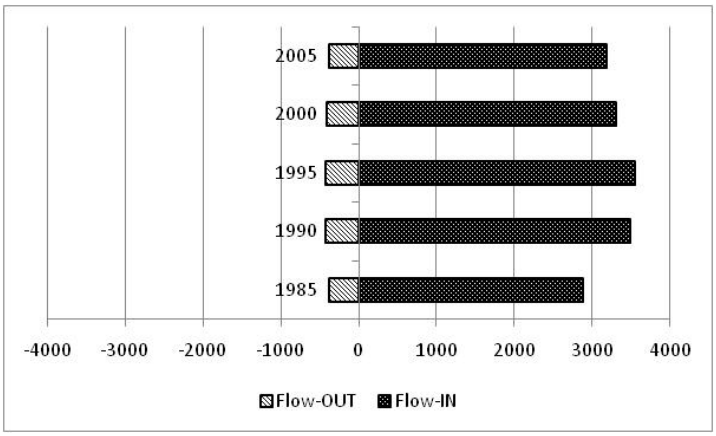

Figure 6: Number of Commuters goes into/out of Inner 23 Wards (Data; National Census)

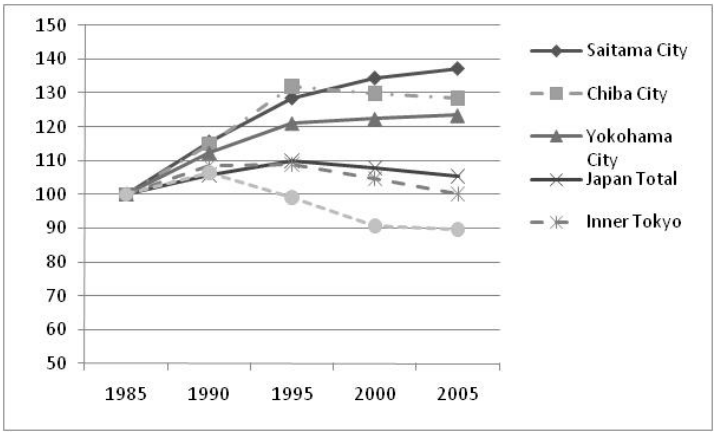

Figure 7: Transition of Work Force Population (Data; National Census)

Figure 7 shows transition of work force populations that set the number of 1985 as 100. In 2005, Japan total work force is slightly increased as 105, but the Designated Business Core Cities, which are located in 30 kilometres away from the central district of Tokyo, are all clearly increased such as that Saitama City as 137, Chiba City as 128 and Yokohama City as 123. However, the 23 Wards area, inner Tokyo, has returned to exactly 100, and the central 2 Words area corresponding to the most prominent Central Business District is decreased to 90.

According to these figures, it seems that these performances indicate that the major aims have been achieving steadily and the structural reforming of the mega metropolitan region by the plan sounds succeeded. Is it really true?

Let's take a look at the future work force populations in the plans of three major leading urban development projects. Minato-Mirai district in Yokohama City was 190 thousand, Makuhari New Centre district was 150 thousand and Saitama New Centre district was 57 thousand. They are surely not small as amount of work force population in a district. However, considering the existing work force population in 23 Words area, inner Tokyo, as a premise of the plan, was 6681 thousand in 1985, and number of commuters who moved into the inner Tokyo was 2603 thousand in 1985, the future populations that would be attained by these projects were so small that it was obvious that major

mitigation of the overcrowded situation was not possible to attain only by these projects from the first time.

Other factors that cause the decrease of commuter train crowding rate from 212% (1985) to 176% (2005) were supposed that 1) increase of transportation capacity of railways and 2) spread of adopting staggered or flex office hours.

As for transport capacity of railways, we can see that there is remarkable promotion on it, for example, total length of railway network has been increased during two decades by 19% in the whole Greater Metropolitan Region and astonishingly, increased by 37% in the 23 Wards area, Inner Tokyo (Annual Statistics of Urban Transport, 2008).

As for staggered or flex office hours, the effect is not sure but according to a survey by Ministry of Home Affairs, the adopting rate was increased from 15% in 1996 to 19% in 2001. It was surely increased, but viewing from the opposite side, it can be said that more than 80% companies still do not adopt it.

Figure 8 shows the transition and accumulation of developed floor area in Minato-Mirai district since 1985 when the project was actually started. Total floor area has reached more than 3 million square meters until 2008 including buildings for diverse uses other than office, though work force population is still one third to the goal of the plan (69 thousand in 2008 to 190 thousand). Picking only facilities with more than 10,000 square meters of floor area, there are 7 shopping malls, 3 hotels, 2 convention centres, 1 exhibition hall, 1 art museum, 2 amusement facilities and 1 hospital in this district. In addition, seeing landscape design in the district, expressions that diverse and enjoyable are not exaggeration. As the result, 53 million people visited the district in 2008. Therefore, it can be said that this urban development has no doubt succeeded in creating an attractive district as the intensive regional core.

3.3.3 Conclusion

Consequently, two aims of “Multi Core and Multi Region” plan such as 1) to mitigate the murderous overcrowding situation of commuter trains and 2) to create attractive sub centre districts for the sub regions are both seemingly achieved so far according to statistic data. However, as for the former aim, contribution of the three large scaled urban development projects is not necessarily large, because the amount of work force population in Inner Tokyo has been extremely big compared to ten or more office skyscrapers. It was clearly found that the most contributed factor to mitigation of overcrowding condition of trains was no other than enlargement of transport capacity of railway network. But as for the latter aim, the achievement is largely depends on these development projects because their sites attract huge amount of visitors by diverse attractive facilities other than office. Landscape designs are also contributed because they created symbolic urban scenes as core districts of each sub region.

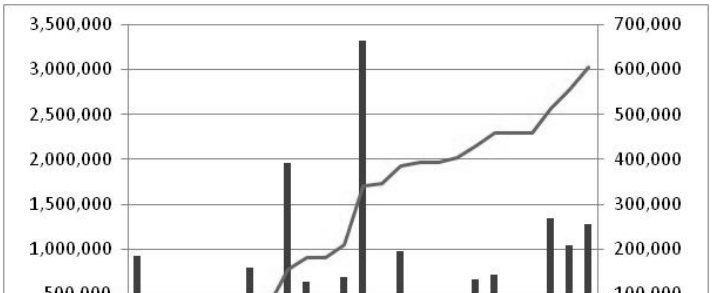

Figure 8: Minato-Mirai in Yokohama City, Floor Supply & Accumulation (Data; Yokohama City Gov.)

Figure 9: Minato-Mirai District, Photo by Urban Development Bureau, Yokohama City Gov.

4. Functional renovation approach in inner Tokyo

4.1 Problems and proposed solution

On the other hand, demand on urban regeneration in the Inner Area of Tokyo had another different aspect in the late 1980s. The major issues in terms of urban regeneration in this area were responding real demand of the business economy and ensuring global competitiveness of the country.

Surely, it was tremendous demand of office floor. Total floor area for office use in 1985, not including the amount of actual converted condominium room to business use, was approximately 40,000 thousand square meters in the 23 Wards, whole area of the Inner Tokyo. In 1986, the National Land Agency of Government announced an estimation that the amount of total area of office floor need to be approximately 80,000 thousand square meters during next 2 decades, doubled to current. The estimation was printed in the Capital Region Reform Plan in 1986, the same plan as of the Multi Core and Multi Region.

These two policies of Functional Renovation in the Inner Area and Structural Reforming of the Region, which are expanding office floor in the concentrated inside area and mitigation of overcrowding commuter trains, might be seemingly contradiction. However, we should pay attention to the other aspects in terms of requirements of the particular age relating to urban issues. For example, occupying floor area per a worker was too small at that time to be improved in order to adapt the electronic information equipments or to ensure the certain level of environmental quality. Moreover, hollowing out relating to heavy and manufacturing industries from the Inner Tokyo, which had begun from the late 1980s, was affected not only economic aspects but also spatial form of land use that planning should deal with. In addition, skyrocketed land price by bubble booming accelerated change of land use in every part of the city.

Anyway, vacant factory sites in the middle of the Inner Tokyo were emerged and increased due to the hollowing out. These sites need to be converted other use than factory such as office buildings or high rise housings. These demands were in conformity with the demand of office floor for service industries such as financial industries and information industries including foreign investors as well as headquarters of large domestic corporations. All of them were required by market and economy at that age.

Changing the viewpoints, the locations of these vacant sites were scattered in inner built up area and were not necessarily concentrated nearby the existing central business district. The fact that railway development such as extension of subway lines was prominently executed, the total length of train network was increased by 37% from 1985 to 2005 in the 23 Wards area as mentioned above, was not only advantageous for those sites but also made extra capacity for transportation in the city. In addition, it was considered that these vacant sites give potential opportunity for the city to improve overcrowded built environments and to remodel to more comfortable and enjoyable places to live and work.

In these contexts, the functional renovation policy on the Inner Tokyo was promoted. The most motivated measure was incentive and deregulation policies on floor area ratio regulation, and the most major players of the policy were private urban development companies.

4.2 Verification

4.2.1 Viewpoints

The aimed effects are as followings;

1. To renovate and expand urban building facilities especially on business function in order to strengthen global competitiveness of national economy

2. To regenerate inner area more intensive and attractive

Therefore, verification should be done from these viewpoints.

4.2.2 Attainments

Figure 10 is comparing the transition of total amount of office floor area and total work force population from 1985 to 2005 in the 23 Word Area, the Inner Tokyo. Office floor has been increased during two decades from 39,236 thousand square meters to 87,029 thousand, which correspond to 2.2 times larger, more than double. It means that the results exceeded the required level which was estimated by the Government two decades ago.

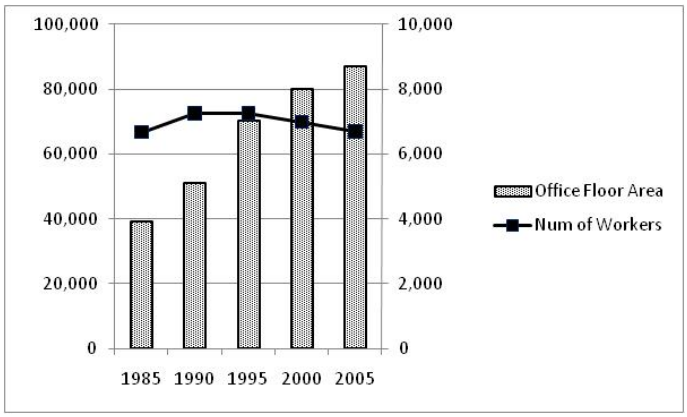

Figure 10: Transition of Total Office Floor & Work Force Population in 23 Wards (Data; Land Data of Tokyo, National Census)

On the other hand, total work force population in the same area was almost no change compared with 1985 and 2005 which actual number is 6,681 thousand and 6,694 thousand. Thus, it means that floor area per person, which is a basic indicator in terms of quality, has been remarkably increased. Seeing data in the area of CBD 2 Wards, where most of the workers are engaged in office jobs, total amount of office floor area was increased from 17,163 thousand square meters in 1985 to 27,465 thousand in 2005, and total number of work force was decreased by 10% as contrary from 1,508 thousand to 1,351 thousand, which means the available office space per person was prominently expanded by approximately 1.8 times larger during only two decades. For reference, vacancy rate of office floor in central 5 wards was 4.2% at the end of 2005. The fact indicates that the increased office floor was absorbed by real demand, instead of decrease of work force population.

Seeing in view of distribution of office floor location, Figure 11 shows that major part of floor increase was occurred in outside of the area of CBD 2 Wards. It is supposed that newly supplied office buildings by land use conversion were major in outside the CBD, while reconstructions or enlargements of old or small office buildings were major in the area of CBD. As the result, business places have been promoted to disperse within the Inner Tokyo. And it should be taken note that capacity of passenger transportation by trains has been remarkably strengthened as well such as that total length of railway network was expanded by 37% in the 23 Wards, Inner Tokyo area, from 533 kilometres to 728, and number of train station was also increased from 470 to 586, also during only two decades. Those changes contributed not only improving quality of working environment to be

more comfortable but also improving travel conditions in the city more comfortable and more efficient.

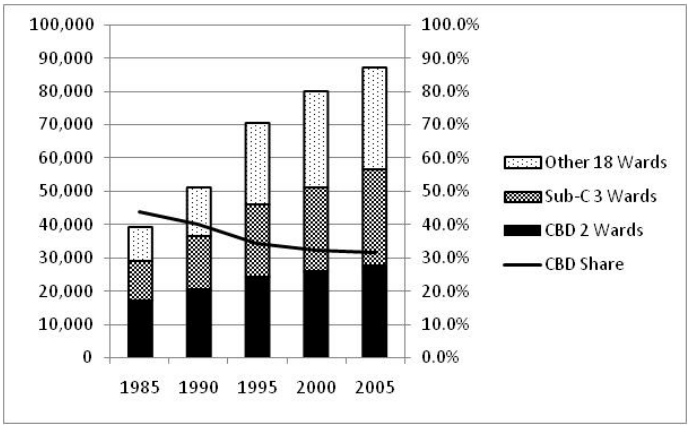

Figure 11: Transition of Total Office Floor & Share of CBD (data; Land Data of Tokyo)

Considering other sub effects, for example, Table 2 is total floor area except housing where supplied services of district heating and cooling system. It describes that other 21 Wards area, where is outside of CBD 2 wards area, occupies 74% of the total, most of which areas are large urban regeneration project sites such as large land use conversion of former factory sites. The fact tells us that the contribution on low carbonizing by those urban regeneration projects is not small. In addition, many of them are in water front locations, which make people more accessible to the water side, create amusement places in the city and add new attractive viewpoints for landscape of the city. In fact, urban townscapes which symbolize Tokyo such as scenic photos of postcard for tourists and background pictures in TV drama or news headlines has changed to water front areas, where seldom be used before only two decades ago.

Table 2: Locations of District Heating & Cooling Area in Inner Tokyo, (2009)

Area	*CBD 2 Wards*	*Other 21 Wards*	*Inner Tokyo Total*
Floor Area (Thou. Sq. M)	*7,870* *34%*	*15,545* *26%*	*32,415* *100%*
Site Area (ha)	*235* *26%*	*668* *74%*	*902* *100%*

(Data; Japan Heat Service Utilities Association)

4.2.3 Conclusion

Consequently, it can be said that the aim of urban regeneration policy in terms of Inner Tokyo seems to be fairly achieved so far, at least in terms of building development as hardware. Floor area per office worker, simple indicator represents spatial quality, has been remarkably increased due to active

supply of office floor has been consecutively continued throughout two decades, and it surely contributes strengthen global competitiveness of the region. Supply of office floor largely depended on land use conversion such as former factory sites, former railway yards and reclaimed sites. Negative sub effects are not obvious, supposed that remarkable expansion of railway network had positive effect on distributed locations of these development sites. In addition, these redevelopment projects contributed creating new attractive places in inner urbanized area in terms of not only enlargement of public open spaces but also retrieving water front access for people, which enriched the landscape of the city as well.

5. Overall conclusion

Since the late 1980s, two different planning approaches were implemented during same period in Grater Tokyo Metropolitan Region in Japan, which were 1) Structural Reforming Approach on Mega Scaled Metropolitan and 2) Functional Renovation Approach on Inner Wards Area. They had different scope in terms of spatial scale but both of them were common in terms of measure by means of urban development projects with large scale vacant sites.

The former approach intends to mitigate murderously overcrowding condition of commuter trains at that time by the measure of developing some new business core districts in dispersed locations at approximately 30 kilometres away from the concentrated central business district. This approach was based on mega regional spatial perspective on 50 to 60 kilometres radius scale with more than 30 million of population. The latter approach intends to increase total office floor area to more than double in the Inner Area of the Region by means of land use conversion of large vacant sites to meet the real demands and strengthen global competitiveness of national economy. One thing that we should pay attention is that the two approaches are seemingly contradictory, because the former intends to relocate and disperse the business work forces from the concentrated central area to about 30 kilometres away, whereas the latter intends to promote increase of total office floor inside the Inner Area.

In this study, the author verified these two planning approaches by comparison of 1985 and 2005, which means before and after, and found that both aim of two planning approaches has been mostly achieved so far, though they were seemingly contradictory.

The reason was analyzed that negative sub effects on traffic congestion which would be generated by development of office floor were largely absorbed by prominently increased traffic capacity of railway network during the two decades and remarkable enlargement of floor area per person, which means improvement in both capacity and quality.

In addition, it is surely recognized that the measure of urban development in large vacant sites contribute adding strong value on the city by means of creating attractive facilities and outstanding places. It should also be noted as positive effect for urban regeneration.

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