Study of the systematization and changed technical standards for planned roads in Japan ; Focusing on the Actual Conditions of Planned Road Revision

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The focus of this paper is the change in the technical standards for planned roads in Japan and their systematization. The idea of a planned road network in a city area was thought to be introduced in the early Meiji period. In this paper the authors analyzes the technical standards for planned roads from the Meiji period and road transformation referring to the historical background and planning theory behind the early time road. Although planned roads have been hardly revised 343 planned roads have been revised recently after changing the principle for the planned network. As a result of this study, some points are clarified as follows. Many revisions of the planned roads were done in late 1960's. Most of the revision's reasons were the realization of a substitution road. These revisions were implemented before the introduction of new City Planning Act in 1968, which obliged the local authorities to hear public opinions for the plan revision in the plan decision-making process. It is estimated that some of the planned roads are not realized in the long term and they were reviewed recently. The necessary elaborated consideration was not enough for the planned road revision because many reasons for revision were centered on the utilization of substitution roads.

From this study it is concluded that it is necessary to examine not only a traffic survey and budgetary allocations but also historic background and the planning goals for city planning.

Keywords : planned road, changes in technical standards, systematization, unimproved for a long time, actuality of revision

1. Introduction

In recent years a review of planned roads has been promoted across the whole country, but most of the reasons for revision were centered on the realization of a substitute road. It is thought that the planning examination concerning future conditions and road alignments was insufficient. In addition, the authors also studied the change in the technical standards for planned roads in Japan as well as systematization. The idea of a planned road network in a city area was thought to be introduced in the early Meiji period. Some existing papers already clarified city planning history(1), research of street plan and plan thought(2). However, research discussing systematization of the technical standards from early period of Meiji and actual conditions of planned road revision doesn't exist. Therefore, it is useful for reviewing existing road network to study the historical transformation of the street planning standards from the beginning in Japan.

As the research method of this study, the technical standard since the early Meiji period is analyzed from the existing literature such as city planning history books and technical standards, as well as actual conditions are studied through the survey results on reviewing planned roads(3)

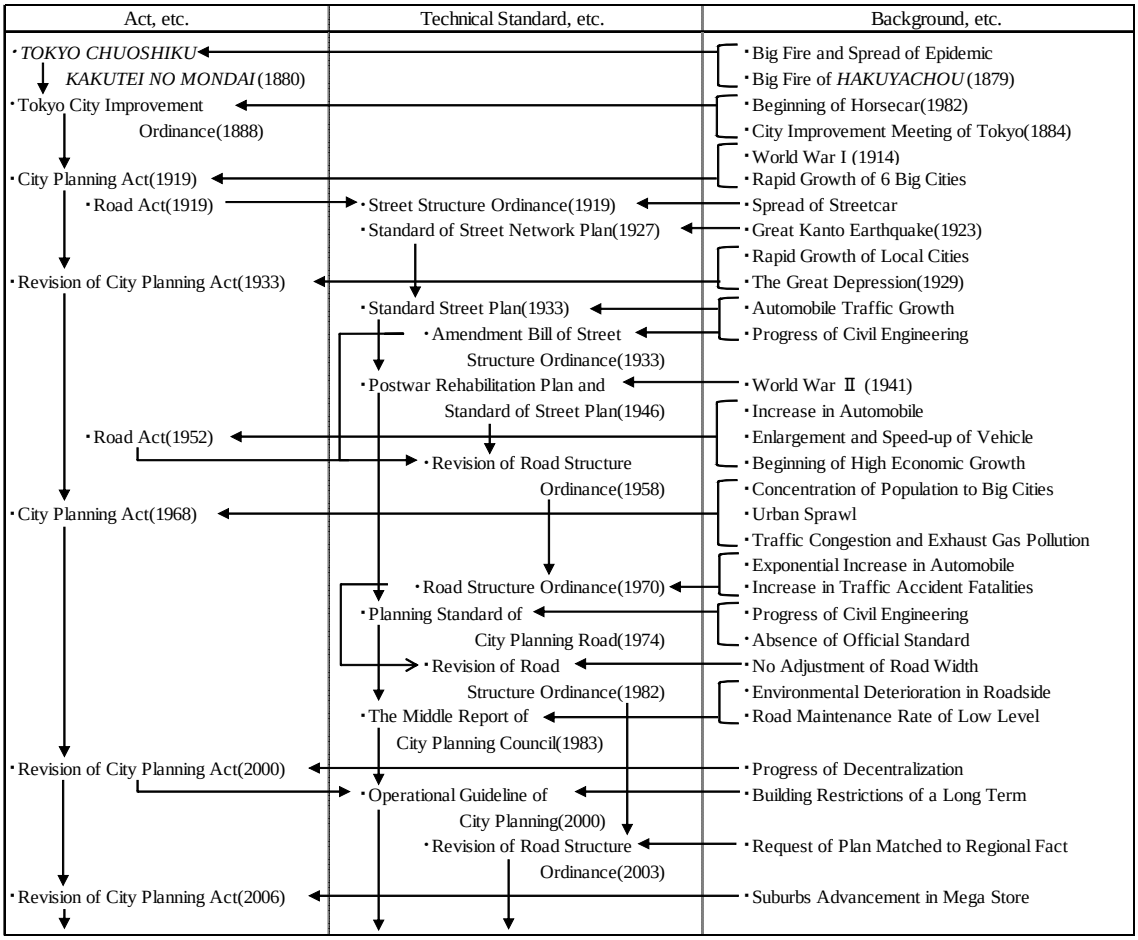
revised in recent years, focusing on the period from 1950's to 1970's when many streets were newly planned.

2. Systematization and Change in Technical Standards

Table-1 shows of change in technical standards in Japan from the early Meiji period to present.

In Japan, the official document that describes a city planning idea for the first time is "*TOKYO CHUOSHIKU KAKUTEI NO MONDAI (City Planning of Central Area in Tokyo)"* published in 1880[(4)]. The background for which this document is made is discussed by Yorifusa Ishida (2004) paper [2)] as "Big fires and spread of epidemic influence this, in which especially the big fire of *HAKUYA-CHOU* that occurred in 1879 and burnt more than ten thousand houses." It is clear that disaster prevention was the main purpose of street planning at that time when the transportation method was walking with some carriages. At first this document was applied to the central area of Tokyo City, Tokyo City Planning Committee concluded that it should be applied to the whole city area after considering increasing of carriages and the starting of the carriage railway. Then the Tokyo City Improvement Ordinance was enacted in 1888. The important aspect of this ordinance is that the authority of city planning was changed from Tokyo City Government to the national government and building restrictions became possible in the planned area. It can be said that this ordinance is the origin of the city planning institutions.

Table-1 Change of the Technical Standards



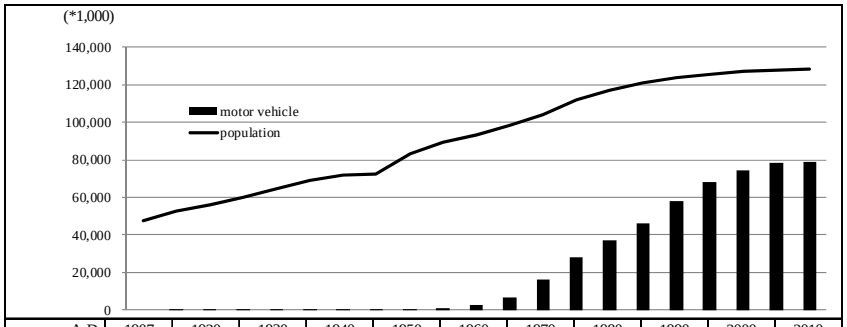
After the ordinance was enacted, the two city plans were introduced in 1889 and 1903 in Tokyo. Realization of the planned contents went ahead smoothly until 1919 when City Planning Act was enacted. However, it is thought that situations of other major cities besides Tokyo showed a deep-seated disorder. The Editing Committee of Urban Planning Chronological Table (1991) describes[3] that “the urban environments of various places deteriorated remarkably caused by rapid development of industry after World War 1 broke out in 1914, and showed various problems such as unplanned street network and new construction of houses which had no facilities of water supply and sewage facility.” This situation caused the government to apply the ordinance for five other large cities other than Tokyo in 1918. However, the planning system which was introduced to plan existing urban area was insufficient to cope with newly expanding urban area. Then the City Planning Act was enacted in 1919(5).

The year of 1919 is also an important year for street planning history like city planning in Japan. First, Street Structure Ordinance and Road Structure Ordinance were introduced based on Road Act, in which “Street” was road in the six major cities where the City Planning Act is applied and “Road” was road in the other cities. The former ordinance introduced the new idea such as the separation of sidewalk and roadway and roadside trees, and also the detailed technical standards such as gradient of the roadway and radius of curvature etc. Moreover, the standard of wide street width was installed in consideration of the Streetcar traffic that had begun to spread at that time. In addition, the procedure of City Planning Decision was established by City Planning Act in 1919 and Urban Building Act in 1919. In addition, the Building Line System newly introduced became an important factor for the street plan. Afterwards, the Plan for Earthquake Revival was announced to revive the Great Kanto Earthquake that occurred in 1923, and the layout standard of street was described for the first time in this Plan. However, the Standard of Street Network Plan directed from the national staff meeting of the city planning conference in 1927 was the beginning as a nationwide standard(6). Jun-ichiro Asano (2008) [5] described about the city planning of the local city at this time that "As for the application city of City Planning Act, it already extended to 71 cities, and the plan has been advanced in a lot of cities according to this standard thereafter", and it is understood that the city planning was practiced in a lot of cities before 1933 described later.

The year 1933 is an important year, and more or less the same as 1919 when City Planning Act was enacted. The reason is the following two points. The application area of the City Planning Act expanded to all cities and a part of towns and villages, and Standard of Street Planning was notified as an official standard. Although the rapid growth of local cities was the main reason for expanding of City Planning application, Takashi Yajima(2009)[8] discussed that in order to relieve the unemployed and develop industrial development against the Great Depression that occurred in 1929 antirecession measures introduced including a street improvement project for prefectural roads, which became the object of the government subsidy from the same year. Anyway, it is thought that it was important also for executing postwar rehabilitation afterwards that the application area of the City Planning Act expanded at this time.

The Standard of Street Planning was introduced according to automobile traffic growth and progress of civil engineering, and the standard of radius of curvature and continuum etc. was added to the Standard of Street Network Plan in 1927. Amendment Bill of Street Structure Ordinance was legislated in the same year for the similar background. Afterwards, Postwar Rehabilitation Plan and Standard of Street Plan were notified across the whole country to revive the damages by World War 2 in 1946. In this notification, the aim was the control of

concentration to the city area and revival of the small and medium local cities, as well a lot of wide width streets were planned especially in the local cities. According to the increase of the number of motor vehicles and large sized and high speed vehicles with the economic growth that began in about 1950, new Road Act was established in 1952. Street Structure Ordinance was absorbed to Road Structure Ordinance by revision of Road Structure Ordinance in 1958. On the other hand, Planning Standard of Street Planning was not revised, and the standard in 1946 was treated as a standard until the 1970's. Rapid development at this time can be understood from the change in the numbers of retained motor vehicles. Figure-1 shows a change of the population and the number of motor vehicles after 1907 when statistics of the number of motor vehicles began. It is understood that the number of motor vehicles increased rapidly after 1950 while the population increased constantly with relatively low rate from this data. The number of motor vehicles increased rapidly from 388,000 cars in 1950 to 16,529,000 cars in 1970 which corresponds to about a 40 times increase. Moreover, it is clear that the city area developed rapidly according to the Road Development of a Five-Year Plan of which the first program was submitted in 1954. Programs from the 2nd to the 6th only were valid for three years. It is pity that the statistics to understand the change of the planned road length at this age cannot be found[8]. Nevertheless it was assured that city planning was undertaken speedily to decide new roads and road improvement.



A.D.	1907	1920	1930	1940	1950	1960	1970	1980	1990	2000	2010
population (*1,000)	47,416	55,963	64,450	71,933	83,200	93,419	103,720	117,060	123,611	126,926	128,056
motor vehicle (*1,000)	0	10	107	217	388	2,898	16,529	37,333	57,994	74,583	78,693

Figure-1 Change of population and number of motor vehicles [7]

The problems such as concentration of population to big cities, urban sprawl, traffic congestion and exhaust gas pollution were caused with the background of such rapid economic growth, and in order to cope with this situation a new City Planning Act was enacted in 1968. The key change in the newly introduced act was the obligation for the administration body to hear the residents' opinions in the procedure of city planning decision. On the other hand, although a technical standard of the city planning was supposed to be prescribed according to the new act there has not been such standard for planned roads until now. For this reason there were a lot of examination items in order to enact a technical standard. After all, the standard was published by the title of Planning Standard of City Planning Road in 1974, and it was operated for a long term though it was not the formal standard[9]. The new road structure ordinance was introduced to cope with an increase in motor vehicles and traffic accidents in 1970, in which the safety standards were considered. Furthermore, revision was done to adjust nonconformity caused by the multiple planning standards in 1982. Moreover, the Minister of Construction

consulted the City Planning Committee in 1982 regarding “what kind of policy was to be held hereafter and its realization” because a lot of problems had occurred and realization of planned roads was usually difficult. The City Planning Committee submitted the Intermediate Report to this consultation in 1983, and the maintenance level of the planned road that had not been indicated as an official standard after 1946 was provided. Afterwards, it is thought that it was an important point to have decided a constant level though the maintenance rate was not improved rapidly.

Decentralization came to be discussed actively as a national policy in 1990's, and the Act on Promotion of Decentralization was enacted in 1995 with the Package Promoting Decentralization Act enacted in 2000 and the City Planning Act was also revised. An important point concerning the revision of this act was that the revision of the planned road was described as possible, which was supposed to be very difficult until then. This change was brought about by the decentralization argument as well as the opposition movement of planned road construction and dissatisfaction with long term building restrictions in the planned road site, which will be discussed in detail in the next section of this paper. The necessity of the revision was described in Operational Guideline of City Planning, and the revision of city planning road came to be advanced on a nationwide scale after that. Road structure ordinance was revised in 2003. The main revised content is reduction of the nationwide uniform standard, addition of standard matched to the each region, and it is used even to this day. Additionally, the maintenance level of the road that was decided in 1983 was abolished. In addition, after 2000, the maintenance matched to the character of the region will be conducted. Decentralization is positively discussed now and, the City Planning Act has been examined for further revision.

3. Actual Conditions of Planned Road Revision and Their Consideration

After the necessity of the planned road revision was described in the Operational Guideline of City Planning in 2000, Prefectures have prescribed the revision guidelines of planning road and their revisions have proceeded. The background of the description of this necessity was thought to be as follows.

The planned road has been revised in various places since 1960's. However, it is thought that it was very difficult for local governments to revise planned roads because all planning decisions were done by the central government before introduction of 1968 City Planning Act and after introduction of the Act the revision needed a lot of cumbersome procedure to get national government’s approval although the local governments could revise them as administrative functions. In such situation, the opposition movement against planned roads in Otaru City of Hokkaido, that started in 1973 changed the thought on the city planning road [9)]. The situation at that time can be understood from the Toshiko Tamura (2009) document[10)] which recorded it in detail, "The mayor worried that the plan was not able to realize forever if the plan that the government decided was revised". From this description, the difficulty of planned road revision was estimated. In addition, the verification of planned road network in Tokyo Metropolitan Area started in 1976 on large scale[11)], which was triggered by residents’ complaints on building restrictions and public pollution, and some planned roads were abolished. It is supposed that this was the first revision case in which the long term building restrictions was dealt with.

After the amendment of the act in 2000 the Investigative Committee of Operational Guideline of City Planning was set up and its report stated [12)] that "In Operational Guideline of

City Planning, the idea about the revision of the city planning should be stated clearly, especially about urban facilities which were undeveloped over the long term". It is thought that this was influenced by the progress of decentralization and the occurrence of the suit [13)] about the city planning road which was not developed with a long term building restriction. Reflecting the report the national government described "Review of the urban facilities of appropriate time and appropriate content" in the Operational Guideline of City Planning. Based on this the Guidelines for enforcing the revision of planned roads issued by Prefecture Governments and the revision of the planned roads have been advanced nationwide referring them.

Based on a questionnaire survey of the actual conditions of planned road revision for the local governments, it was clarified that 343 planned roads had been revised by March, 2009 nationwide from 2009 to 2010. Table-2 shows the main revision reasons and the decision year of 343 planned roads. In the survey the responses can be obtained from 29 local governments against 31 local governments which revised their planned roads. In this table, many revisions of planned roads are understood that the plan decision was done from 1950's to 1970's. These times were a period of high economic growth in Japan, and not only the city planning roads but also a lot of roads were maintained along with the rapid increase of number of motor vehicles. Naturally, it is thought that a lot of new roads were planned at this time. Although it is obviously thought that revised roads increase in corresponding to the number of planned roads, half of them are "realization of the substitution road" for their revision reason. It is estimated that the revision for which the reason is the change in the social environment such as change of traffic and preservation of historical area increases if it is a road where the plan decision was made to deal with the rapid increase of number of motor vehicles and rapid growth of cities. However, when the reason for the revision is realization of the substitution road, it is thought that the inspection of the examination concerning future location and road alignments when the plan was decided was insufficient. In addition, when the planned

Table-2 Planned Year and Revision's Reasons of Reviewed Roads

(roads)

Planned Year	realization of the substitution road		Change of traffic		Preservation of history resource		Problem of topography		Others		Total	
1920〜1924	0	0%	0	0%	0	0%	1	4%	1	1%	2	1%
1925〜1929	2	1%	0	0%	3	8%	0	0%	7	10%	12	3%
1930〜1934	1	1%	1	4%	3	8%	0	0%	1	1%	6	2%
1935〜1939	0	0%	0	0%	4	11%	0	0%	1	1%	5	1%
1940〜1944	4	2%	0	0%	0	0%	2	7%	0	0%	6	2%
1945〜1949	15	8%	10	40%	2	5%	2	7%	7	10%	36	10%
1950〜1954	29	16%	2	8%	14	37%	0	0%	10	14%	55	16%
1955〜1959	18	10%	4	16%	4	11%	8	29%	10	14%	44	13%
1960〜1964	25	14%	2	8%	1	3%	3	11%	10	14%	41	12%
1965〜1969	44	24%	3	12%	2	5%	5	18%	5	7%	59	17%
1970〜1974	20	11%	0	0%	2	5%	3	11%	5	7%	30	9%
1975〜1979	16	9%	1	4%	1	3%	3	11%	10	14%	31	9%
1980〜1984	3	2%	1	4%	2	5%	1	4%	3	4%	10	3%
1985〜1989	1	1%	1	4%	0	0%	0	0%	0	0%	2	1%
1990〜1994	0	0%	0	0%	0	0%	0	0%	1	1%	1	0%
1995〜1999	2	1%	0	0%	0	0%	0	0%	1	1%	3	1%
2000〜	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Total	180	100%	25	100%	38	100%	28	100%	72	100%	343	100%
		52%		7%		11%		8%		21%		100%

year of the revised road is analyzed in detail, it is understood to concentrate at the time of early 1950's and late 1960's.

The reason concentrated in late 1960's is thought to be influenced by the City Planning Act enacted in 1968 because it introduced the obligation to hear residents' opinion in the procedure until the plan decision. The pollution damage and the lawsuit caused by an increase in number of motor vehicles had increased at this time. Therefore, it is thought that the city planning department tried to avoid listening to the resident opinion by the process of plan decision of city planning road. It is corroborated by the fact that Yorifusa Ishida (2004) [2)] described "There were many staffs of local government that demanded the plan decision panicking at the City Planning Division of former Ministry of Construction just before the City Planning Act was enforced in June, 1969. In this way, it appears clearly that administrative sides try to avoid the procedure for citizens' participation." That is, it is thought that there were a lot of cases in which enough examination were not conducted to expedite decision processes. It is regrettable that after planning new roads without executing enough examinations planning restriction on building site had been continued until the revision for a long term as more than forty years.

As for the case of early 1950's it is thought that large-scale merging of towns and villages based on the Law of Promotion of Merger of Towns and Villages in 1953 influenced although the document describing about situations of plan decision at that time is not found. The plan decision reason for each planned road has not been investigated in a nationwide survey. However, there was a comment such as "There is a road planned as a symbol of merging of municipalities, but it is doubtful for the really necessary road considering a wide area road network" by staffs of N city (Approximately 400,000 population) and I city (Approximately 100,000 population), which was get from our interview. It is thought that there should be other roads planned by the same reason.

As a result of above consideration, it is clarified that many cases revised in recent years include planned with insufficient examination as well as planned influenced by law amendment and merging of municipalities.

4. Conclusion

This paper contains a study of the change of the technical standards for planned road in Japan and its systematization, and also studies the cases revised recently on the first decision time and revision's reasons of the planned road.

As for the transformation of a technical standard of the planned road, these are clarified as follows. The idea of the city planning arose to deal with frequent occurrence of big fire and spread of epidemic. In order to deal with rapid growth of cities, increase of number of motor vehicles, and automobile traffic growth, a law and a technical standard applied nationwide uniformly were enacted and revised. According to lowering the city growth rate and advancement of decentralization, the standard revised to match the characteristics of each region. It was described in a planning document in recent years that it is necessary to revise the existing city planning.

The following were clarified as a result of investigating the first decision time and revision's reasons of the planned road that had been revised recently. The plan decision time of the revised roads concentrated in early 1950's and late 1960's., Most of the revision's reasons were realization of the substitution road, and there are many revised roads without enough

examinations at the time of merging of municipalities after 1953 and before the City Planning Act enactment in 1968.

It is important to alter institutions according to the change of social conditions. However, before large institutional revision, there were relatively many roads were planned without enough investigation. In the current legal system, it is a rule to hold a public hearing before major plan decision and plan revision, but some cases do not take this procedure because it is not compulsory. In addition, the system for public review of a draft plan is also insufficient because the length of two weeks for public viewing is too short and reviewers need to visit the municipal office in the office time on only weekdays. In this situation, the plan decision procedure will be still carried out without enough arguments. Therefore, these are proposed for improvement as follows. The Public Hearing should be obligation, the term for public viewing of plans should be prolonged and planned information should be also open through the internet. In addition, it is necessary to examine a traffic survey and budgetary allocations as well as historical background until formal plan decision and the future goal of urban area structure in the early stage of the planning process.

Notes:

(1) References 1), 2), 3), 4) and others.

(2) References 5), 6), 7) and others.

(3) The questionnaire survey and interview survey were executed for the whole country from 2009.12 to 2010.2. It was clarified that 343 planned roads were revised as a result.

(4) For instance, a new idea of city planning was described for the first time in this document and the starting point of City Renewal Ordinance of Tokyo thought to be an origin of the City Planning Act was this document are described to p.40 of reference 2) and p.63 of reference 1).

(5) For instance, the limitation of the City Renewal Ordinance is discussed with pp.85-86 of reference 2) and pp.12-20 of reference 4).

(6) In reference 7), it is discussed that the configuration standard of street was decided first as a nationwide standard is Standard of Street Network Plan in 1927.

(7)The population data: from the material of Statistics by Ministry of Internal Affairs and Communications HP http://www.stat.go.jp/data/chouki/zuhyou/02-01.xls (accessed in 2011.03)
The number of motor vehicles data: from the material of Statistics by Land Transport and Transport White Paper after 1951, and data by material of Transportation statistics of issue in 1951 before.

(8) As a result of the inquiry of City Planning Survey and Information Office, City Planning Division, City and Regional Development Bureau, Ministry of Land, Infrastructure, Transport and Tourism of JAPAN, statistics before 1966 do not exist.

(9) The decision process and the actual conditions of the Planning Standard of City Planning Road are described in p16 of reference 8)

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