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The Urban Improvement Problems Resulting from the Changing Urban Spatial Structures of Provincial Central Cities in Hokkaido —1960 ~ 1980—

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Abstract

Throughout the high growth period beginning in early 1960's, remarkable changes in Japanese economy and society have been brought about. Urbanization of the cities in Hokkaido has advanced rapidly and intensely during the past two decades. The phenomenon of urbanization with its remarkable urban transformation is becoming less marked these days. However, the social and economical structure is becoming highly complex with changing life-styles. Therefore, there is still much need for restructuring urban areas and for improving urban environment in provincial cities.

In this paper, the trend of rapid urbanization and the transformation of urban areas in provincial central cities of Hokkaido in the post-high growth period are analyzed. The study is made to find out a relatively broad understanding of how urban land uses are structured and how improvement plannings should be carried out with special reference to the provincial medium or small-size cities.

1. Preface

In the past 20 years since the early 1960s, extremely large socio-economic changes have taken place, the likes of which have not been experienced in the history of urbanization of Hokkaido. During this changing period, long-term comprehensive plans have began to be instituted, one after another, by many provincial cities.

In this paper, analyses are made on changes in urban spatial structures, urbanization processes, and changes in urban areas, which the local municipalities of Hokkaido have experienced. Also, from a viewpoint of urban planning, the various issues faced by urban areas resulting from rapid urbanization are discussed and summarized, and further land use as well as urban environmental improvement are discussed from a planning viewpoint.

In research laboratories of the author, positive research and investigations have been conducted on the changes in urban spatial structure with regard to local communities in Hokkaido. In this paper, discussions concern urban living and activities, as well as changes in urban areas as viewed from the aspect of urban physical space. These studies are based

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on initial research and investigations conducted from 1950 and 1960, and also data obtained from the following period (1960-80).

The followings are major statistical results and materials used for the present study. National census (1960, 65, 70, 75, 80) ; Resident registration (1965—80) ; Survey of Hokkaido municipalities (1965—81) ; City planning census (Obihiro area —1974, 80, Kushiro area —1979, 1984, Kitami area —1977, 1982) ; Present land use map(1960—80) ; Residential map ; City Planning in Hokkaido ;

2. Population fluctuation of municipalities in Hokkaido

From 1960 through 1980, the municipalities and in fact the entire society of Japan showed remarkable changes. During the first half of this period, Japanese economy registered high growth, and the resulting rapid urbanization was accompanied by uneven local changes of population (overpopulation and depopulation).

Municipalities in Hokkaido were no exception. During the 20 years following 1960, selection process made progress, i.e., division of the municipalities occurred between a group of developing cities, as represented by Sapporo, whose population increased rapidly (+167. 6% population increase in 20 years), and a group of shrinking cities as shown by coal mining cities such as Utashinai (−73.2% population decrease in 20 years). The concentration and

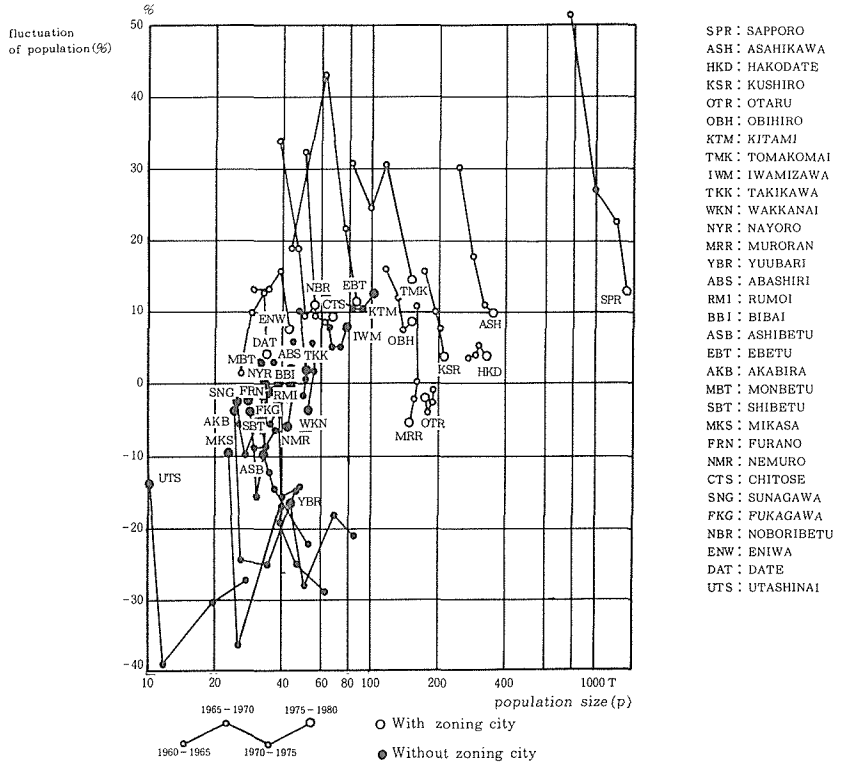


Fig. 1 population size and fluctuation of population (1960～1980)

dispersion of population has begun to slow down since 1973, when oil crunch took place and ended the high growth of the Japanese economy, and necessitated alterations in economic policy.

Since the 1970s changes in population have been slowing down through-out Hokkaido, with the population fluctuation rate of 24 of Hokkaido's 32 cities, from 1975 to 1980, remaining within 10%/5yr (annual average 2%). In other words, the population of Hokkaido's cities has begun to be stabilized.

And now is the time when more emphasis shoud be placed on the creation of comprehensive living environment under a low growth economy, rather than on city development plannings.

3. Urbanization of cities in Hokkaido

The percentage of population living in the urban areas (DID : Densely Inhabited District) increased from 42.1% in 1960 to 59.7% in 1980, which is similar to the population concentration (60%) in major prefectures on Honshu. However, the total area of DID occupied only 0.8% of the land in Hokkaido in 1980 (extremely low compared with the approx. 10% in the major prefectures in the Main Land).

This makes it necessary to reconfirm the fact that 60% of the total population of Hokkaido live in urban areas, which accounts for only 0.8% of the total area of Hokkaido.

On the other hand, the population density of the urban areas tend to decrease. In 1960, the average population density of 32 Hokkaido cities stood at 92.3 p./ha. Relatively highly density and compact urban areas, as seen up to 1960, began to decrease ; and in the ensuing 20 years, less densely populated urban areas have rapidly come into being in the areas surrounding the build-up areas.

Around the year 1955, urban areas in Sapporo (conurbation with a pop. dens. over 25 p./ha, and with the total population of the urban areas approx. 390,000) were within a radius of approx. 5 km from the city center. The following dispersion and expansion of local urban areas can be regarded as characteristic phenomenon.

Increases in the area of urban areas exceeded the population increase rate, and this fact can be attributed to the following ; decreases in the number of people to a household caused by separation of households due to nuclearization of families in post-war society ; existence of the strong demands for relatively less expensive residential land area or to own houses in the surrounding areas (these first two constitute social factors) ; promotion of motorization ; shortening of transport time required due to improvement of road networks and public transportation facilities ; non-central location of planned industrial sites and large-scale facilities.

4. Composition of population in urban areas

Although the population density of the urban areas is still tending to decrease, since 1975 the distribution of the population in the urban areas has gradually begun to equalize. In local cities with a population below 200.000, the population density of the central business districts was the highest, at over 80 p./ha in 1970. and since then the density has decreased as people move towards the surrounding areas. In 1970, about half of the population of these cities (54.1%) was accommodated in the built-up areas, and it is considered that the central business district and their surrounding areas had relatively high living conditions. From around 1975, the following trends became remarkable : the population density of the central business districts and built-up areas increased, and also the density in newly developed areas increased, but the density throughout the entire urban area began to equalize.

By 1980, population in the built-up areas had decreased to 1/3 (38.0%) of the total. However, the decline of night-time population in the central business districts, caused by the separation of business and living areas, was not as marked a decrease as that of inner cities in the metropolitan area.

In medium and small-sized cities with population of less than 100,000, with no Urbanization Promotion Area (UPA) designated, sparsely populated newly developed areas, with

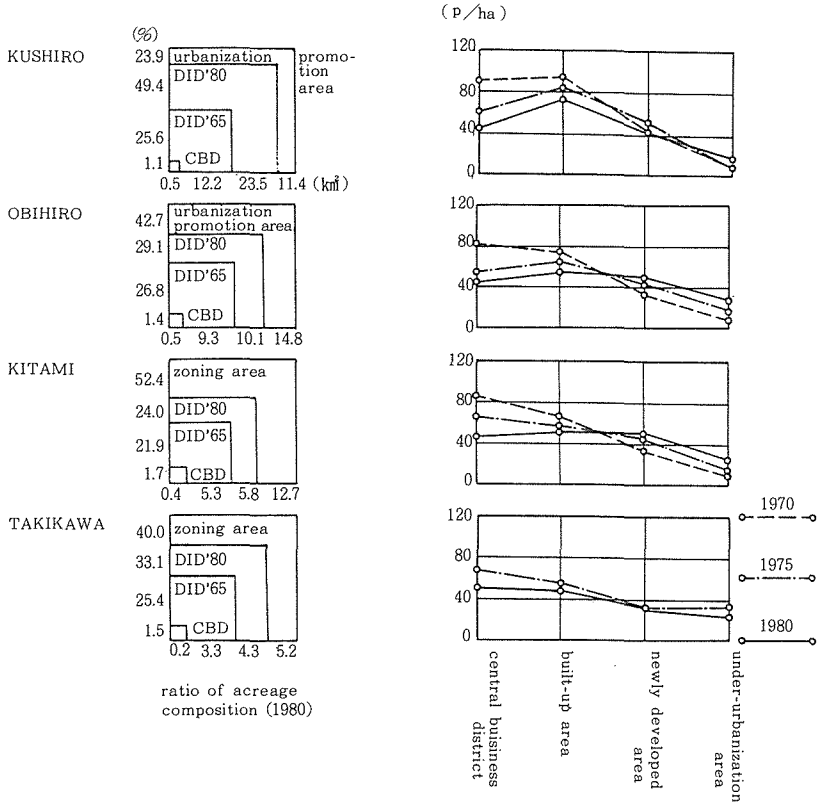


Fig. 2 Changes in acreage composition and population density

population densities less than 20 p./ha, have rapidly been built around the central urban districts.

These newly developed areas occupy about 1/3 of the over-zoned urban areas (Zoning area), and furthermore, as they spread to the surrounding areas, constitute phenomena unique to medium and small-sized cities in Hokkaido.

Upon investigation of changes in population density on a micro-scale, using one block as a measuring unit, it was observed that decreases in population density in the central business districts and the built-up areas do not necessarily occur equally within the entire district. Rather, areas with a stable population are being formed within the built-up areas as people settle there, resulting in limited population fluctuation. At the same time, the existence of areas of renewal was observed where urban renewals were making progress in close relation with the regional structure of the entire urban areas.

In newly developed areas and under-urbanized areas, vacant space is gradually filled, and urbanization progresses along a single-dimension. Whereas in the central business districts, the built-up areas and matured newly developed areas without remaining vacant space and where the improvement of the urban infrastructure is complete, urban functions and spatial structure changes in close relation with the urban structural regulation factors.

In the future , it will be necessary to promote the improvement of urban areas, using the methodology and planning systems which is best met with the changing characteristics of the urban areas. Specifically, this means project-oriented methods and planning systems for the newly developed areas and the under-urbanized areas, and for the central business districts and the built-up areas this means methods and planning systems based on the restricted introduction method and strategically combined with the project-oriented method.

5. Characteristics of population-stable areas and improvement planning

In medium and small-size cities, the need for the well-planned reorganization of urban areas and the securing and improving of their functions and settlement conditions is growing as urban areas and planning measures change. Also, in urban areas, two types of districts coexist, i. e., urban districts where the population density changes in close relation to the entire urban structure of the city, and population-stable areas where the population density is constant. In this section, "population-stable areas" in the built-up areas of Kushiro, Kitami and Takikawa, during the period of 1970～1980 are discussed, trends and conditions of the stable settlements in local cities are investigated, and the future urban improvement plans are studied.

Population-stable areas, occupying approx. 40% of the built-up areas, are residence-based urban areas mainly consisting of exclusive houses and apartment houses. The formulation of these stable areas in the built-up is considered to be the result of choice of citizens residential places while seeking for better dwelling environments. Especially in the densely populated stable areas, there are many districts where residence-based facilities are

specialized, and constitute an important facet of these urban areas. Residents of the stable areas are mostly composed of people employed by companies and offices and the self-employed, about half of whom belong to the "stratum of society living in the built-up area" who repeatedly move with-in the built-up areas ; the flow of these people plus the in-flow of the "newly settled stratum" from within the city and also from the surrounding municipalities help to formulate the the stable areas. Residents of the stable areas cite practicality and better living environments as their main reasons for choosing residential sites, and the owner occupied status is a supporting factor in settlement.

Furthermore, with regard to movement, residents within the stable area are not always stagnated, but rather demonstrate constantly dynamic conditions by changing residences, altering land use, modifying buildings, etc. The presence of the "stratum living in built-up areas" and the "newly settled stratum" in the stable areas constitutes a major factor in maintaining the well-balanced conditions of the local communities. Therefore, there is a need for the formulation of planning programs for stable living environments ranging from

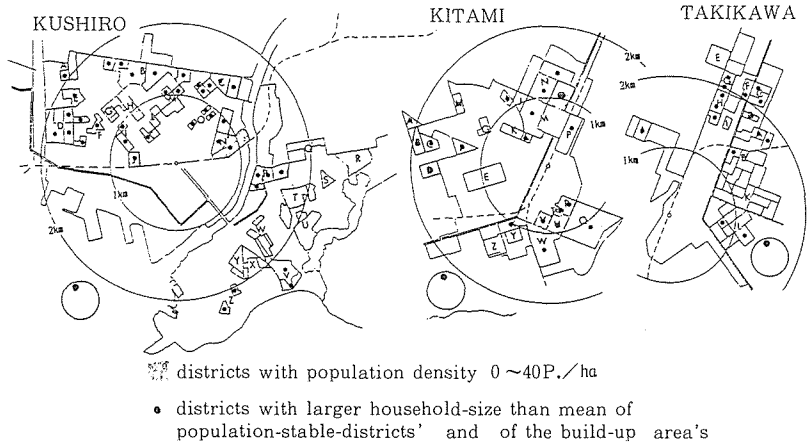


Fig. 3 Location of population-stable districts

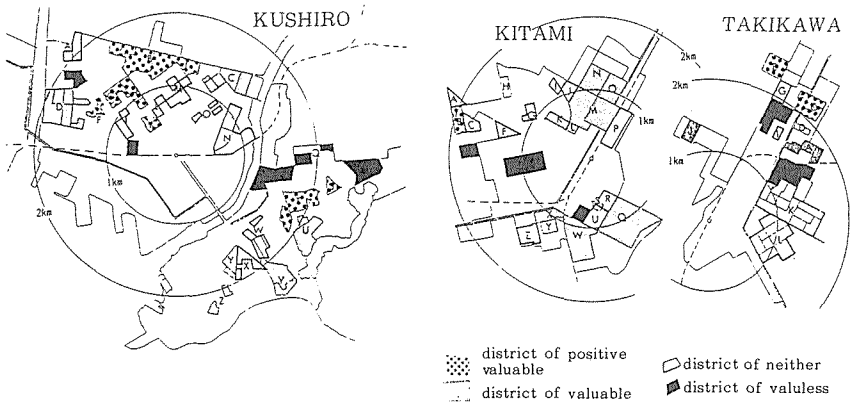


Fig. 4 Typology of population-stable districts based on evaluation by inhabitants

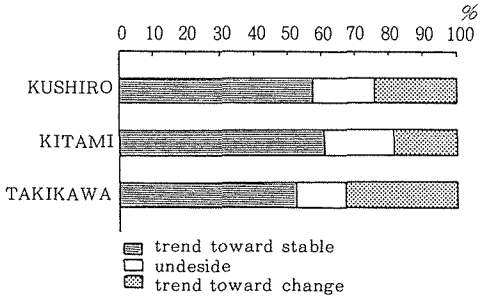


Fig. 5 Trend toward stable settlement

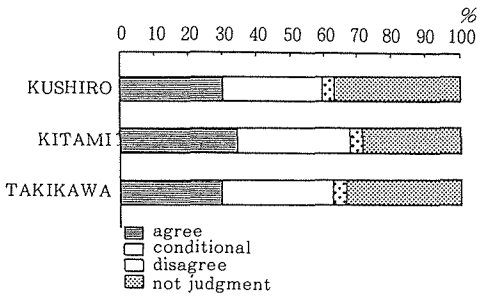
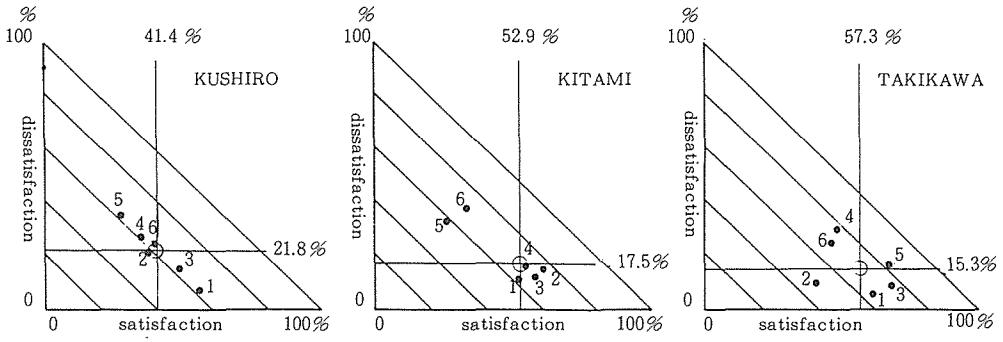


Fig. 6 Trend toward an architectural agreement



1: toward stable-settlement: Living below 5yrs. 4: toward changing: Living below 5yrs.
2: toward stable-settlement: Living 5-10yrs. 5: toward changing: Living 5-10yrs.
3: toward stable-settlement: Living above 10yrs. 6: toward changing: Living above 10yrs.

Fig. 7 Evaluation of Daylight

the micro-environment to larger districts.

The need also exists for introduction-type methods designed to improve the urban environments, by positioning the stable areas in the built-up area, as well as and also by ascertaining environments for evaluation, and the need for public investment.

6. Location and accumulation processes of social facilities and formation of local Urban-cores.

Urban space is characterized and organized by highly potential urban and district core (urban dwelling core) and consequently a unique urban structure is composed. Especially in the urban spaces, the composition of sphere (service units), which is created by the accumulation of social facilities, has strong effects, with units of social communities (region, district, dwelling unit) organized by stratification.

Studies were conducted on the formation of Urban-cores in Kushiro for the past 20 years from 1965 ; the following is a discussion of these study results.

Classification of the characteristics of facilities is possible using the following factors : the existence or non-existence of location standards required for constructing new social facilities and planning programs, and spatial closeness after the expansion of the sphere. At

first, in 1965, "free location type" facilities (incl. commercial, medical facilities,etc. whose location is decided by economic supply & demand) concentrated in the center of the built-up area, thus strongly indicated the urban structural centers. However, along with the expansion of the urban areas and the scope of everyday activities, and equalization of population density (night-time) throughout the entire urban area, these facilities concentrated in districts along the major trunk roads. So as the population distribution shifted towards the surrounding areas, the urban structural centrality lessened. Secondly, "location standard-guidance type" facilities (incl. community halls, district halls, parks, athletics ground, gymnasium, etc., which require the use of standards for planning of locating facilities, and whose location & introduction can be decided upon by the administration), are characterized by the relatively equal dispersed distribution pattern, which respond to the demands and requirement for facilities in each district. Thirdly, "regulation-based type" facilities (incl. kindergarten, nurseries, children-hall, elementary & junior high schools, police stations, fire stations, etc., whose location rights belong to the administration according to the registration) are always equally distributed throughout the entire urban area in response to the urban expansion.

Each one of these social facilities does not, by itself, demonstrate its connection with the entire urban structure. It is observed, however, that as a whole these facilities tend to overlap and accumulate over space, spreading from points to lines, and further to plains, and thus the nucleus of the community or district.

As the result of the analysis, and while keeping in mind the districts of accumulation including those where a group of facilities is closely related to, or in close proximity to, social facilities, it was found that "free location type" facilities increase in the vicinity of " location standard-introduction type" facilities, and the combination of "regulation-based type" facilities and "location standard-introduction type" facilities is increasing. Furthermore, in recent

Table 1 Groupinng of facilities by planning process of location

process of location	spatial colseness ‹great›	‹mediumm›	‹less›
free location type	commercial facilities general clinic (4 km) dental clinic (4 km) public bath barber · beauty parlor	hospital	polyclinic large-size retail
location standard-guidance type	neighbourhood center (500m) child park (250m)	district center (2 km) neighbourhood park general park	pablic hall athletic field (4 km) gymnasium (4 km)
regulation-based type	day-care center (500m) nurserv school (500m)	child center (2 km) primary school (2 km) police facilities (2 km) fire station (2 km) post office (2 km)	junior high school high school home for aged facilities for the handicapped municipal office branch

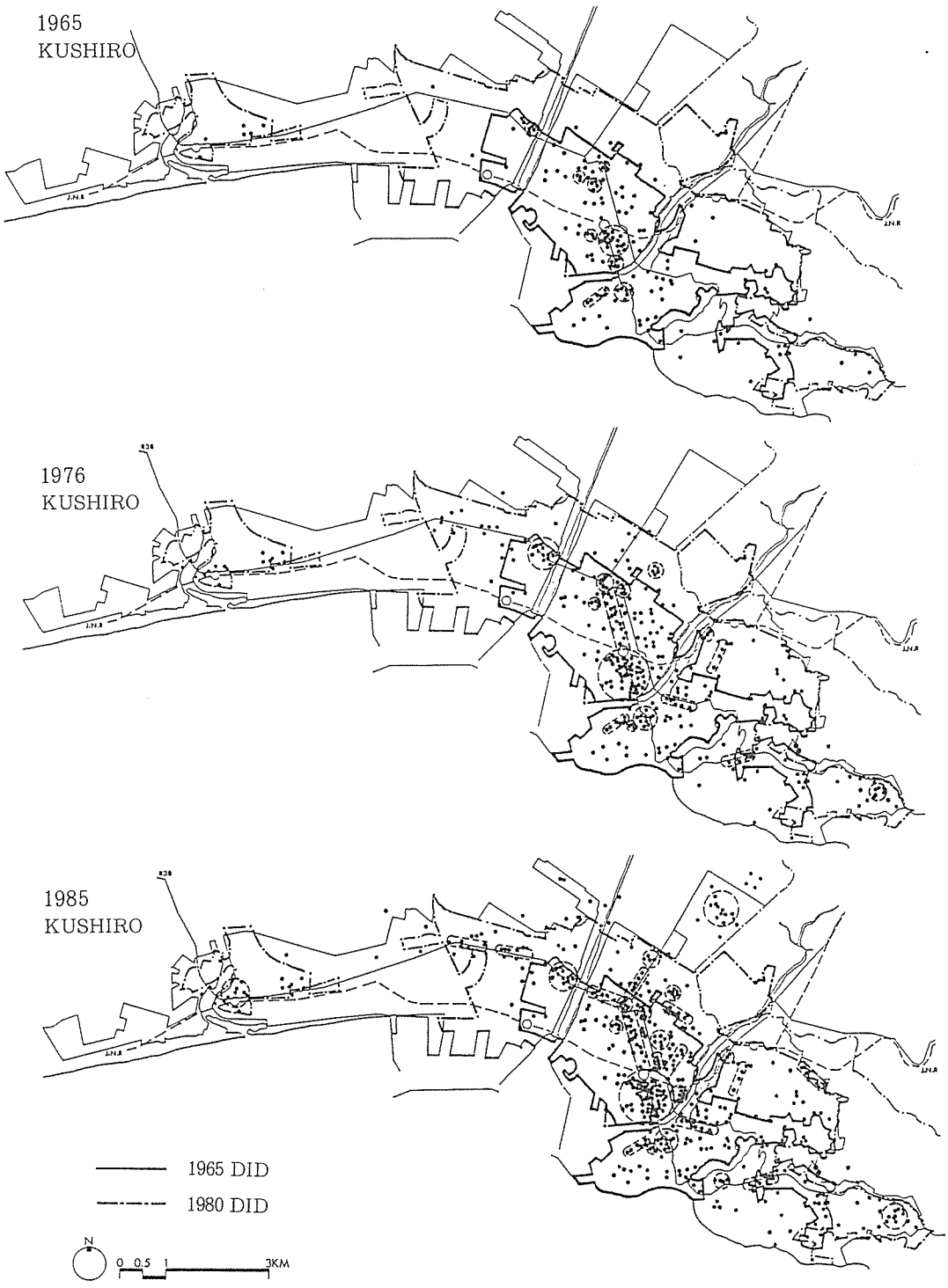


Fig. 8 Location and accumulation of social facilities

years, the combination of large and small facilities in the utilization zone has been increasing, as well as the stratification of accumulated facility zones ; we can assume the formation of accumulation zones as compound urban dwelling cores. Therefore, an attractiveness of urban dwelling core cannot be created only from the viewpoint of similar networks, keeping in mind the closeness to the basic dwelling unit. In the future, it will be necessary to create social facilities through mixed development plannings, with an emphasis placed on the relationship between different facilities.

7. Formation of mixed residential-industrial urban areas

Since 1960, the extensive spatial expansion of urban areas accompanied by an increase in area at an accelerated speed exceeding that of the population increase. During the high growth period of the Japanese economy, the great expectation for the location of industrial facilities was placed even in medium and small-size cities in Hokkaido, and many well-planned industrial sites and districts were prepared in the suburban areas. Subsequently, spreading of medium and small-sized urban areas became remarkable, with residential functions extensively spreading ; in the suburban areas, mixing of residential and industrial functions is occurring, resulting in the formation of mixed residential-industrial areas.

On the subjects of the mixed residential-industrial areas in the vicinity of built-up areas of Kitami (pop. 106 thousand) and Iwamizawa (pop. 84 thousand), issues facing these areas are summarized and investigated.

The mixed residential-industrial districts located in the surrounding of urban areas (suburban-type mixed residential-industrial areas), exist in a belt-like or surface-like patterns as follows : along with the trunk roads in the light industrial or residential district, in the category 2 exclusive residential district located in the hinterland, in the suburban industrial districts with residential space, and also in the residential districts.

The suburban-type mixed residential-industrial areas can be classified into 12 types

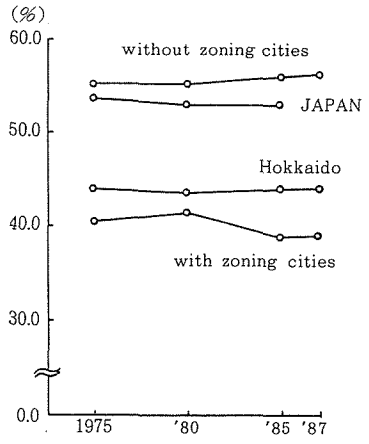


Fig. 9 Transition of ratio of mixed-use district

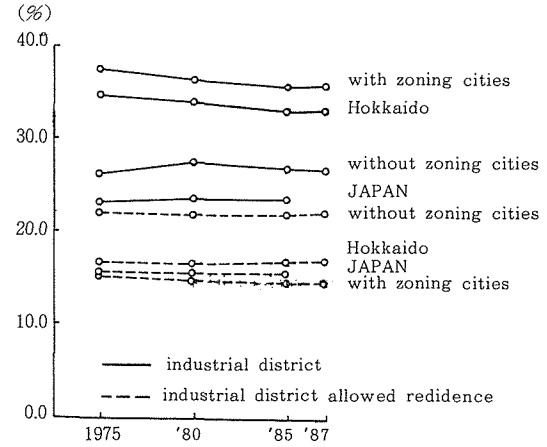


Fig. 10 Transition of ratio of industrial district

according to the relations to the state of industrial accumulation and trunk roads, and the areas are characterized by "an increase in residence ratio", "a decrease in combined-use residence ratio" and "a decrease in education & welfare facility ratio". Along the trunk roads, commercial, and service industries and light industries related automobile industry, forming a new mixed type urban areas which is different from the conventional mixed residential-industrial areas consisting of residence and production / processing factories. Especially, along the trunk roads in the vicinity of the built-up areas, a decrease in service industry facilities, a slight increase in light industry facilities, and an increasing in apartment houses as well as combined-use houses with retails, are observed. Furthermore, in the sites with access to roads, industrial facilities tend to expand toward their hinterland and also house location tends to expand toward the route. As a result, they cause the worsening of living environment due to the formation of ill-designed structures of roads within the hinterland and excessively jammed and close packed buildings.

The following are two major viewpoints in future planning of the improvement of suburban mixed residential-industrial areas :

(a) viewpoint to improve as regional dwelling cores ; In mixed urban areas depending on the trunk roads, residential facilities are centered on the route-utilization-type industrial facilities accumulation sites because of the location of the automobile-related service industry and light industry facilities. Therefore, the problems occur regarding worsening of living environments and safety of the citizen caused by the penetration of production related roads constructed through the residential districts. Thus, it will be necessary to carry out improvement plannings on conditions that the division is made by locating industrial and commercial facilities along the route and residential areas in the hinterland.

(b) viewpoint of coexistence and infusion between production and living environments ; In the areas where coexistence occurs in the residential areas, inter-professional solidarity unique to the home industry, and lateral connections among different industries through a cooperative organization are very strong, showing a similar state of coexistence to that seen in the mixed residential-industrial areas formed by middle and small-size enterprises in the built-up areas. In these areas, the viewpoints of coexistence and harmony are of great importance. Especially, in mixed areas where the high-technical assembly plants such as for precision equipment, electric appliance, etc., and residential spaces coexist, the creation of new urban-type production & dwelling cores in good harmony with living environments, rather than the functional purification of block units, must be taken into account.

8. Conclusion

The systematic investigation of provincial cities should be conducted using planning theory and viewpoint, clarifying the characteristics and problems in forming urban districts. Some of the results obtained are follows ;

1. It is necessary to establish the method of realizing a structural improvement system, such as "a method of creating movement" and "a method of riding with the movement", based on the scale of an area and a city, and the urban infrastructure and the movement of the whole urban space.
2. Two different types of situations in stable districts in the built-up area are described ; environments in good condition which should be maintained and preserved, and the districts which need future public investment. The importance of making a planning for stabilizing the environment and establishing the method of improvement as well as introducing the plan is emphasized.
3. There are two major viewpoints in future planning of the improvement of suburban mixed residential-industrial areas ; a) view point to improve conditions as a dwelling core districts. b) viewpoint to coexistence and infusion between production and living environments.

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