Abstract

With an increase of population flow to the city centers in Kobe City, the suburbs are now suffering from a drastic change in redistribution of population. Since people are moving to more convenient places of residence, all housing sites in the suburbs are competing against other sites not only in the city centers but also within the suburbs or the same town. Thus, the suburbs are at a new phase of the urban development cycle. This paper aims to study how residents have adapted their lives to such stagnant suburbs, and further to offer suggestions on how to establish a sustainable city form, based on good relationships between the suburbs and the city centers.

For this purpose, two types of residential sites were surveyed; a newly built high-rise flat nearby a subway station in a new town and a relatively old detached house community in another new town. Furthermore, two kinds of lifestyles are introduced as a viewpoint for analysis; an urban lifestyle that makes much of conveniences and a suburban lifestyle that makes much of amenities.

From the findings, the concept of compact town in the suburbs is offered to be an important component of a sustainable city form. The compact town needs to allow for people preferring different lifestyles to cohabitate. The measures which need to be taken are as follows. Two types of conveniences need to be offered. One is easy access to urban services for daily life inside the town. This is a necessary condition for a town to be compact and needs to be provided for by planning at the beginning stage. The other is good transportation services to visit elsewhere to compensate for the lack of residents' needs inside the town. This is a necessary condition for residents to practice their preferred lifestyles and requires to be provided by planning mainly based on public investment.

Residents preferring a suburban lifestyle were shown to be very sensitive to convenience of transportation probably because they depended much on public transportation for visiting elsewhere, especially city centers. Sustainable city forms often force people to change their means of transportation from cars to public transportation. That might induce people to make more of accessibility to such services. This requires much attention to a combination of transportation services within towns, to the town centers, and to outside the towns.

No gaps were shown among those preferring different lifestyles both within each site and between the two sites in their levels of satisfaction with amenities and in the degree of their contribution to enhancement of livability. Thus, amenity was shown to be a crucial factor for bettering living environment and, also, to be easily produced by proper town planning in the suburbs. Since amenities are ultimately a competitive

power against city centers, any housing development which lessens amenities should be avoided. Finally, community needs to be fostered for a long period. Preference for community varies greatly among residents, but town planning can support fostering it indirectly by providing facilities.

1. Introduction

The population of Japan is estimated to have reached its peak in 2004. It is now in its first population decline since World War II, and Japan as a whole has already entered a longstanding depopulation process (The National Institute of Population and Social Security Research or NIPSSR 2005). Locally, twelve big cities with populations over a million all recorded increases in their populations between 2000 and 2005. So did eleven of fourteen cities with populations between a half million and a million. It was only fifteen among forty-seven prefectures[1] that population growth was observed. They all have big cities with populations over a half million. Focusing on such cities, people are concentrating in city centers while suburbs, especially distant from the centers, are conversely suffering depopulation (Tomita 2004). Does such a "back-to-the-city movement" indicate a reurbanization process?

The urban development model advocated by Klaassen et al (1981) sets four phases of development; urbanization, suburbanization, counterurbanization and reurbanization. However, these stages have by no means clear definitions. Especially, the concept of reurbanization is confusing as the advocates were cautious about the prospects for large-scale reurbanization (Champion 2001). The recovery of population in larger cities in the United States and Europe have been reported (Cheshire 1995, Bootsma 1999), but the question is simultaneously rising as to how long this process will continue and whether it is significant enough to initiate a new round of urban growth (Champion 2001). Regarding Japan, the National Institute for Research Advancement (2005), referred to as NIRA, shows that the future of major provincial cities may closely resemble counterurbanization, or the declining stage of the urban cycle. With continuous depopulation, there is little hope for reurbanization. There remains indeed much room for argument over whether the trend can be called reurbanization or not, but a back-to-the-city movement[2] in Japan has been marching on under a decline of its total population.

The urbanization unique process in land use in Japan must be noted for such a consideration. Due to a tradition of wooden buildings and provisions against earthquakes, historically two-story houses have often been dominant in residential areas even in city centers. However, such houses were gradually replaced by high-rise commercial buildings or flats, whenever the Japanese economy boomed in the post-war

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[1] A prefecture roughly corresponds to a former county in the UK.

[2] This means re-concentration of population in city centers, which consists of not only returning of those who had once lived in city centers, but also inflows of new comers and natural increases of residents.

period. People moved to flats or migrated to suburbs where housing communities were actively developed. As a result, many big cities suffered depopulation in their city centers. Changes occurred in urban land use after the middle of the 1990s (Kawai 2005). One and two-story houses have been replaced mainly by high or super high-rise flats. Because the land prices have fallen due to economic stagnation, a number of reasonable houses of high quality have also been built in redeveloped areas of relatively large cities (Research Institute for High-Life 2001, Nakayama et al 2003). Consequently city centers have been attracting people from older areas within the cities and their suburbs as well as from other smaller cities and towns[3]. This process may be called "regeneration of city centers as residential areas by advanced land use in depopulated societies". Such a view conflicts with the NIRA's report and also may not suit Klaassen et al's model. However the process will certainly induce changes in the relation between city centers and their suburbs, and probably gives us clues about future urban forms in Japan.

The following causes generally explain the reurbanization process which occurred in Europe (Bootsma 1999); temporary economic changes due to the recession in the early eighties, demographic changes as a result of postponed marriage and family formation, increases in female labor force participation, social-cultural changes in the form of a positive reassessment of urban living, and finally increases in the number of immigrants. These causes, except for the last one, hold true in Japan as well. Additionally, Japan has an aging population. Old people are suffering from physical and mental handicaps in daily life (Ohmi 2003). Such causes roughly tie in with increases in demands for various conveniences and with rises in flexibility when choosing homes (Nishikawa et al 2003). The two factors together have brought about changes in people's preferences for their places of residence (Matsumura 2002). That is, people have come to make much of convenience in residential sites.

For these various reasons, the suburbs in Kobe are losing the power to attract people to them. This paper aims to study, with an emphasis on convenience, how residents are adapting their lives to such stagnant suburbs, and further to offer suggestions for establishing a sustainable city form based on good relationships between suburbs and city centers. For this purpose, two viewpoints are put forward; condition of residential sites and residents' preferred lifestyles. In addition, two types of

[3] In medium size cities, this trend attracts attention as an effective means to dissolve a doughnut effect and to form compact city (Kitahara 2002). On the other hand, Nishinomiya City, between Kobe and Osaka, is suffering the lack of capacity of schools due to a quick increase of population in the city center (Saruwatari 2004)

residential sites in new towns are considered. One is a newly built high-rise flat nearby a subway terminal station in a big new town. The other is a relatively old detached house community in a small new town. Then, two kinds of lifestyles are defined based on whether people make more of conveniences or amenities in their residential sites (Ueno 2005). Conveniences here correspond to accessibility to urban services, such as job opportunity, shopping, medical treatment, public transportation and so on. Amenities here correspond to living conditions including number of rooms, width of gardens, quality of the neighboring environment, such as public parks, promenades, natural views, landscape and so on. Lifestyle that makes more of conveniences is called an "urban lifestyle", and one that makes more of amenities is called a "suburban lifestyle". Residents adjust their way of life to the conditions of a site, and their lifestyles determine the methods for such behaviors. Thus, their behaviors are described, analyzed and considered in order to achieve the aim of this paper.

2. Background of the study

2.1 Population of Kobe City

Kobe City covers an area of 551 sq. km and has a population surpassing one and a half million. It is located in the prosperous western area known as the Kansai Region on the main island of Honshu (Fig1). Geographically, the city can be roughly divided into two areas by the Rokko Mountain Range. The southern portion, which faces Osaka Bay, forms the old urbanized areas (referred to as the "old area"), while the western and northern areas have become the scene for the development of large-scale new towns. In this paper these areas are considered as the suburbs in Kobe[4]. Stretching like a ribbon 30 km east to west and 2 to 4 km north to south, the old area occupies roughly 30% of the city area, but is home to 60% of the population. These 170 sq. km, have a population of over one million, making its population density almost 6,000 people per sq km. On the other hand, the suburbs, which represent a larger space of about 380 sq. km, are home to less than 500,000 people. Thus, the population density in that area is quite low, at close to 1,200 people per sq. km, compared with an average of over 2,750 people per sq.

Fig. 1 The location of Kobe City

[4] It is one of the features of the city form of Kobe that the city includes large suburban areas.

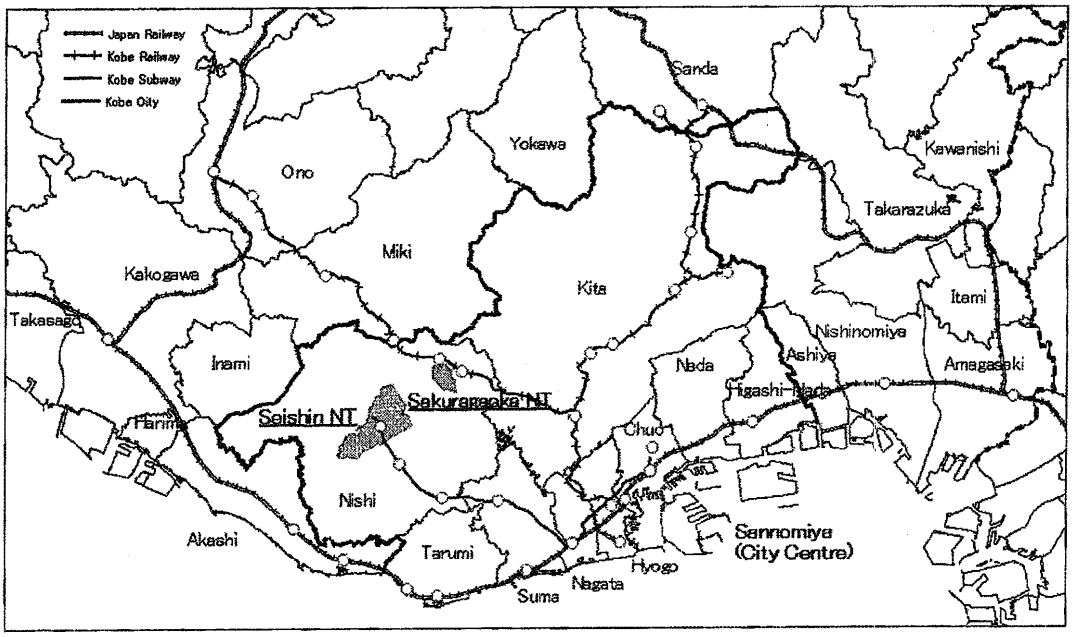

Fig2 Kobe City and its surrounding areas

km for the city as a whole.

It must be further noted that Kobe suffered massive damage, mainly in the old area, caused by the Great Hanshin-Awaji Earthquake which occurred in 1995. This resulted in wide changes in the city planning due to the urgent need to swiftly revive the devastated areas and many new redevelopment projects, especially around the major railway stations. This reformation of the spatial structure in Kobe improved the living environment in the old area. However, this paper stands on a view that the earthquake was not a cause but only a trigger for the back-to-the-city movement, which would surely have emerged even if the earthquake had not occurred. This is because such a process had simultaneously started in other big cities all over Japan.

A number of flats supplied by these redevelopment projects have been received population inflow, including refugees, from the outside of the city as well as from other areas within the city. In addition, a fall in land prices has simultaneously stimulated the demand for and supply of houses. Many houses are so nearby railway stations that they offer residents much convenience in commuting, visiting elsewhere for shopping and medical treatment, etc., and so attract both young and old people (Hyogo Earthquake Memorial 21st Century Research Institute 2002). These things have been promoting a population recovery in the old area.

2.2 Population movement in Kobe

Kobe City consists of nine wards (Fig 2), of which areas and population are shown in Table1. Suma ward is divided into South Suma and North Suma for purposes of analysis. The old area had been already urbanized before the 1960s, comprised of

Table 1 Area and population of the 9 wards comprising Kobe City

Wards	Area (sq. Km)	Households	Population	Population density (per sq. Km)
Total	552.2	651,738	1,525,389	2,762
Old area	128.2	348,534	732,960	5,720
Higashinada	30.4	89,829	206,041	6,787
Nada	31.4	61,559	128,048	4,078
Chuo	27.8	63,221	116,602	4,188
Hyogo	14.5	53,896	106,987	7,358
Nagata	11.5	48,105	103,771	9,055
South Suma	12.6	31,924	71,511	5,698
Suburbs	424.0	303,204	792,429	1,869
North Suma	17.5	38,957	100,118	5,737
Kita	241.8	83,759	225,940	934
Tarumi	26.9	92,851	222,725	8,283
Nishi	137.9	87,637	243,646	1,767

Note1) Data on October 1 in 2005.
Note2) Suma ward is divided into South Suma and North Suma.

Higashinada, Nada, Chuo, Hyogo, Nagata and South Suma. The suburbs have been developed mostly after the 1970s, comprised of North Suma, Tarumi, Kita, and Nishi. Table 2 details the change in population between 1980 and 2005. The old area shows a slow decline until 1995* and then the sudden rise in 1995 followed by continuous recovery. However, to be more precise, differences in trends after the earthquake are observed among wards in the old area. Higashinada, Nada, and Chuo show a relatively fast recovery which the others have maintained their reduced population.

The old area is divided into two zones based on the difference in recovery trends. In Higashinada, Nada, and Chuo, the populations have recovered their size of the same levels as just before the earthquake. However, Hyogo, Nagata, and South Suma have remained lower. Here, the former group is called the "east zone" and the latter group the "west zone" (Fig 3). Changes in population after 2000 are shown by an index based on the 1995* pre-earthquake population count in Table 3. The east zone had already recovered to its 1995* population size by 2002, and Higashinada earliest by 2001, though the west zone has not yet done so. This difference may be explained by the number of redevelopment projects as well as the area's popularity as a place of residence. The east zone is located between the central district of Kobe[5] and Osaka City, the business center of the Kansai Region. From prewar days, the east zone has been an attractive place of residence for those who commute to Osaka. That is why a

[5] This indicates the area which spreads out between two main railway stations, Sannomiya and Kobe in Chuo ward.

Table 2 Change in the population of the wards

	1980	1985	1990	1995*	1995	2000	2005
Total	1,367,390	1,410,834	1,477,410	1,520,365	1,423,792	1,493,398	1,525,389
	90	93	97	100	94	98	100
Old area	839,717	803,417	779,281	754,393	618,113	702,652	733,446
	111	106	103	100	82	93	97
East zone	103	102	102	100	84	98	105
Higashinada	183,284	184,734	190,354	191,716	157,599	191,309	206,041
	96	96	99	100	82	100	107
Nada	142,313	133,745	129,578	124,538	97,473	120,518	128,048
	114	107	104	100	78	97	103
Chuo	115,329	119,163	116,279	111,195	103,711	107,982	116,602
	104	107	105	100	93	97	105
West zone	122	112	105	100	79	87	86
Hyogo	142,418	130,429	123,919	117,558	98,856	106,897	106,987
	121	111	105	100	84	91	91
Nagata	163,949	148,590	136,884	129,978	96,807	105,464	103,771
	126	114	105	100	74	81	80
South Suma	91,863	86,220	81,748	78,908	63,255	70,016	71,511
	116	109	104	100	80	89	91
Suburbs	528,457	608,216	698,935	766,772	806,401	791,505	792,718
	69	79	91	100	105	103	103
North Suma	63,820	95,746	106,371	110,041	113,252	104,040	100,118
	58	87	97	100	103	95	91
Kita	164,714	177,221	198,443	217,166	230,473	225,184	225,940
	76	82	91	100	106	104	104
Tarumi	212,758	224,212	235,254	237,735	240,203	226,230	222,725
	89	94	99	100	101	95	94
Nishi	86,942	110,774	158,580	201,530	222,163	235,758	243,646
	43	55	79	100	110	117	121

Note 1) 1995* is the population on January 1 just before the quake occurred on January 17.
Note 2) Except for 1995* the population corresponds to that on October 1.
Note 3) The second row for each ward is an index setting the population for 1995* as one hundred.

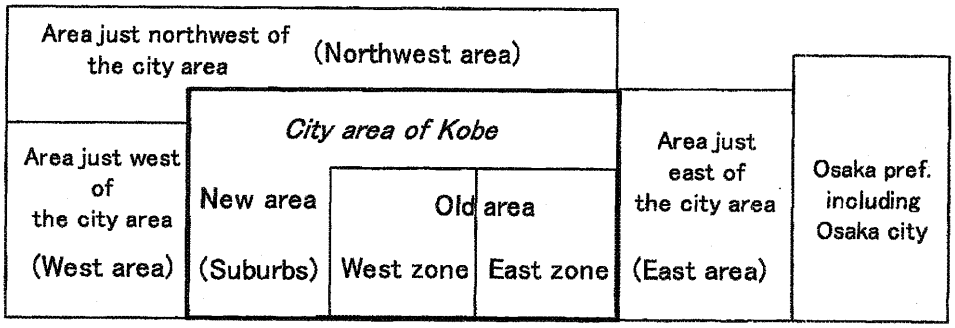

Fig 3 Geographical positions of areas

number of high or super high -rise flats have been built after the earthquake especially in this zone.

The suburbs as a whole accommodated refugees from devastated areas in the old area and recorded a peak population in 1995 (Table 2). After that, the population quickly decreased and has maintained only a little larger population than it had in 1995*. However, there are some differences among wards (Table 3). Kita has roughly

Table3 Change in population after 2000

	1995*	2000	2001	2002	2003	2004	2005
Total	100	98	99	99	100	100	100
East zone	100	98	100	102	103	104	105
Higashinada	100	100	102	104	105	106	107
Nada	100	97	99	100	101	102	103
Chuo	100	97	99	100	102	103	105
West zone	100	87	87	87	87	87	86
Hyogo	100	91	91	92	92	91	91
Nagata	100	81	81	81	80	80	80
South Suma	100	89	90	90	91	91	91
Suburbs	100	103	103	103	103	103	103
North Suma	100	95	94	93	92	91	91
Kita	100	104	104	104	104	104	104
Tarumi	100	95	95	95	95	94	94
Nishi	100	117	118	119	119	120	121

Note 1) Figures are indexed to the population of 1995* set as one hundred.
Note 2) The old area is divided into east zone and west zone.

kept the same size of population since 2000. Nishi shows a slight increase in population. The others are suffering depopulation. The difference probably corresponds to the history of development. North Suma and Tarumi had been developed earlier than Kita and Nishi, and have already matured to be, what we call, "old suburbs".

Table 4 exhibits proportions of young and old people to the total population. As a whole, young people are reducing their share of the population while old people are increasing theirs. However there are differences among areas and wards. The share of old people is largest in the west zone, followed by the east zone and then the suburbs, while that of young people in the reverse order. A rise of the share of the population by old people between 2000 and 2005 is largest in the suburbs, followed by the west zone and then the east zone. For young people, there is a decline in the share of the population is largest in the suburbs, followed by the west zone and a slight increase in

Table 4 Proportions of young and old people to the total population

	Rate of young people(%)			Rate of old people (%)		
	2000	2005	Change	2000	2005	Change
Total	13.8	13.2	-0.6	16.9	19.6	2.6
East zone	12.0	12.6	0.6	17.4	19.1	1.7
Higashinada	13.9	14.4	0.6	15.0	17.1	2.1
Nada	11.3	12.4	1.0	18.9	20.8	1.9
Chuo	9.7	9.7	0.1	20.0	20.8	0.8
West zone	11.2	11.1	-0.1	22.3	25.0	2.7
Hyogo	10.3	10.4	0.1	23.2	25.4	2.1
Nagata	11.6	10.9	-0.7	22.4	25.7	3.3
South Suma	11.9	12.4	0.4	20.8	23.4	2.6
Suburbs	15.7	14.3	-1.5	14.7	17.7	3.0
North Suma	14.8	12.8	-2.0	13.5	18.2	4.7
Kita	15.7	14.5	-1.3	15.2	18.3	3.1
Tarumi	14.2	13.2	-1.0	17.5	20.7	3.2
Nishi	17.6	15.7	-1.9	12.1	14.1	2.0

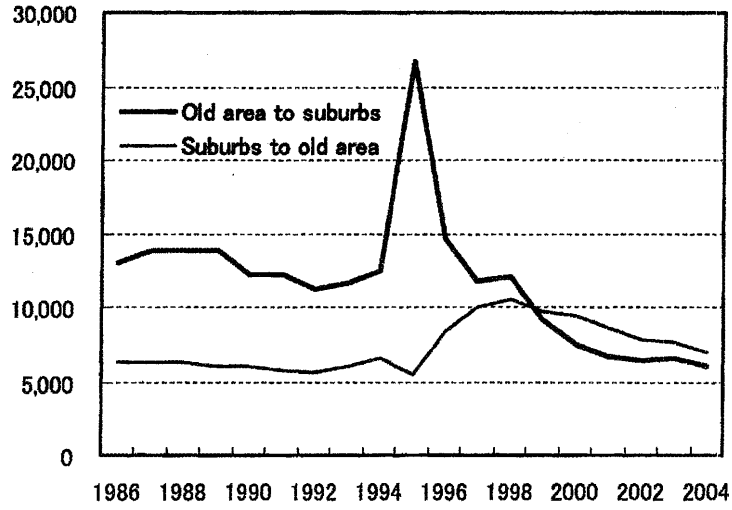

Fig4 Population flow between the old are and the suburbs

the east zone. The east zone shows the smallest rise in the share of old people and the largest rise in the share of young people. This suggests that the inflow to the east zone includes not a few young people. The suburbs show rapid aging of residents probably caused by a lack of diversity in the population composition as well as low mobility of its residents.

Fig 4 shows the population flow between the old area and the suburbs. Before the earthquake, there had been a constant surplus of population inflow to the suburbs. Residents fled to the suburbs in order to seek for better living environments. Inflow to the suburbs suddenly rose up to the peak in 1995 and then quickly reversed, due to the swift comings and goings of refugees[6]. It was when the last temporary houses were removed, at the end of 1999, that the bidirectional flows negated each other. Since then, the surplus of inflow to the old area has been gradually getting smaller. However, recovery of the level of inflow to the suburbs that existed before the earthquake is not expected.

According to Table 5, the east zone is attracting people from both inside and outside of the city, but the reverse in the case for the suburbs. Especially the outflow to the east zone is large. Nevertheless, the suburbs are attracting people from the areas just west and northwest of the city area, referred to as the "west area" and the "northwest area", respectively. As shown in Fig3, the west area consists of Akashi, Kakogawa, Takasago, Inami and Harima. The northwest area consists of Miki, Ono and Sanda. The situation in the west zone is between that of the east zone and the suburbs concerning population movement. The suburbs are generally pulling in people from the west and northwest areas, and pushing people out mainly to the east zone. In other words, the

[6] Considering city planning for disasters, it must be specially mentioned that the new towns could provide refugees with reserved land for temporary houses to ease their lives for a while.

Table 5 Average net population inflow to three areas, 2001-2004

	East zone	West zone	Suburbs
Total	5262	636	-1098
From inside the city	1408	-52	-1329
East zone	-	-286	-1106
West zone	294	-	-223
Suburbs	1114	234	-
From outside the city	3855	688	231
East area	286	-77	-381
West area	406	135	795
Northwest area	113	28	250
Others	3050	602	-433

Table 6 Average net population inflow to wards in the suburbs, 2001-2004

	North Suma	Kita	Tarumi	Nishi
Total	-1035	-8	-983	932
From inside of the city	-631	-191	-854	351
East zone	-213	-267	-358	-269
West zone	-107	18	-130	-5
Suburbs	-312	58	-367	625
North Suma	-	17	32	265
Kita	-17	-	-25	-15
Tarumi	-31	25	-	375
Nishi	-265	16	-373	-
From outside of the city	-403	183	-130	581
East area	-139	75	-181	-136
West area	9	62	115	610
Northwest area	13	190	-23	70
Others	-286	-144	-41	38

suburbs are attracting people from less urbanized areas and pushing people out to more urbanized areas. Inflow from other areas within the city is positive only in the east zone, while it is negative in the west zone and the suburbs. Inflow from outside the city accounts for 73%[7]of the total inflow, and most of these people come from beyond the Kobe area[8]. These means that the east zone is attracting people from not only inside but also outside the city. Thus the east zone has become a center for attracting people and is contributing to a rise in the total population. It is fair to say that the east zone is leading the back-to-the-city movement in Kobe.

Table 6 exhibits population movement in the suburbs. North Suma and Tarumi have large negative inflows. They are suffering an excess of migration to almost all areas, especially to Nishi and the east zone. On the other hand, Nishi generally shows a large net inflow. It is pulling in people from other areas within the suburbs as well as from the west area, and pushing people out to the east zone and the east area. Although, Kita is scarcely keeping a status quo as a whole, it is loosing relatively as much

[7] This was calculated through dividing 3855 by 5262.
[8] The total is 3050, and 1333 of these come from Osaka Pref. including Osaka City.

population to the east zone as other wards. These facts indicate that there are great differences in the population movements within the suburbs, which have recently been stagnating in size. Nishi, which is focused on here, is relatively prosperous among them.

2.3 The two new towns

Residents in two new towns in Nishi ward were surveyed for this study. One new town was Seishin Newtown (referred to as Seishin NT), which is located 25 km northwest of the central district of Kobe. It has direct access to there by a subway and a road for cars only. It takes about 30 minutes by either method from the town center to the central district. People partially started to live there in 1982, and 53,500 residents were living in an area of 634 ha in 2005. The other town was Sakuragaoka Newtown (referred to as Sakuragaoka NT)[9], which is located 6 km northeast of Seishin NT. It takes approximately 60 minutes by bus and railway from the town center to the central district. People partially started to live there in 1974, and 9,800 residents were living in an area of 135 ha in 2005. It takes not more than 20 minutes by bus or 10 minutes by car to get from there to the town center of Seishin NT. Since the town center does not provide residents with enough urban services, they depend on Seishin NT for the lack of urban services[10]. Table 7 shows changes in population in both NTs. The population decrease between 1995 and 2000 in Seishin NT clearly reflects the movements of earthquake refugees. Although population increase in both NTs is observed between 2000 and 2005, they are rather less than that between 1990 and 1995. The age indexes for these two NTs are increasing faster than for Nishi ward as a whole. This suggests

Table 7 Population change in the two new towns

	1990	1995	2000	2005
Nishi ward	158,580	222,163	235,758	243,646
Population index	100	140	149	154
Aging index*	0.35	0.56	0.69	0.90
Seishin NT	28,385	54,761	50,654	53,460
Population index	100	193	178	188
Aging index	0.14	0.49	0.48	0.85
Sakuragaoka NT	7,942	9,167	9,656	9,803
Population index	100	115	122	123
Aging index	0.30	0.67	0.99	1.38

Note) * is defined as a rate of the number of people more than 65 to that of the number of people under 15. It gets larger as the number of old people increases or the number of young people decreases.

[9] Seishin NT has been developed by the Kobe City municipal enterprise, while Sakuragaoka NT by a private enterprise.

[10] For example, one third of the households go shopping in Seishin NT more than once a week (Kamise 2005).

Table 8 Characteristics of the two surveyed areas

Kojidai survey area	2001	2002	2003	2004	2005
Households	82	72	361	556	569
Population	87	83	814	1316	1357
Under 15	1	4	132	241	271
65 and over	0	0	63	113	121
Age index	0	0	0.48	0.47	0.45
Nakamachi survey area	2001	2002	2003	2004	2005
Households	605	609	612	607	627
Population	1712	1681	1645	1631	1648
Under 15	140	144	144	142	152
65 and over	337	346	372	386	405
Age index	2.41	2.40	2.58	2.72	2.66

Note) There were no ordinary residents in Kojidai till 2002. The population and households until then correspond to the number of residents in the dormitory of a general hospital.

both NTs are maturing quickly, especially Sakuragaoka NT. One part of each NT was chosen for this study: Kojidai's fifth community block[11] (referred as to "Kojidai survey area") in Seishin NT, and Nakamachi's second and fourth community blocks and a part of Nishimachi second community block[12] (referred as to "Nakamachi survey area") in Sakuragaoka NT.

As shown in Table 8, the population of the Kojidai survey area has been quickly increasing[13]. This is because of the building of large houses nearby the subway station[14]. Due to the ten-year long recession in the Japanese economy in addition to the earthquake, land use around many of railway stations has drastically changed all over Kobe. This area is one typical case. Some office buildings and company dormitories were closed and replaced by high or super high-rise flats. In addition, some lands reserved for business and commercial development were changed to land for use as housing. On the other hand, the Nakamachi survey area was developed earliest in Sakuragaoka NT and has never changed its land use, and thus exhibits a high age index level.

3. The questionnaire survey

3.1 Outline

One questionnaire survey was carried out in February 2004 on residents of an

[11] Kojidai is one of the six areas in Seishin NT, each corresponding to an elementary school division. The fifth block is one of five community blocks in Kojidai. The town center and the subway terminal station are there.

[12] On the other hand, Sakuragoka NT has four neighborhoods comprising one elementary school division. Each neighborhood has several community blocks.

[13] Before the beginning of a supply of high-rise flats, only staffs of a medical center were living in a dormitory there.

[14] A supply of houses as flats is 305 houses in 2003, 192 houses in 2004 and 209 houses in 2006. Other than that, there is much supply by the same way in the area near to other subway stations in Nishi ward and North Suma.

eighteen-story flat in the Kojidai survey area. It has 305 households. The period of residence for all was eight months at that time. It is located in one corner of the town center and within a few minutes' walk to the subway terminal station, a bus terminal, a big hotel, a medical center, a shopping mall, a department store, a supermarket, a municipal library, a municipal branch office, a funeral hall and so on. The questionnaire was put in all households' mail boxes, one part for the household as a whole and another part for a couple of the following household members: the householder and his/her partner, otherwise the householder and any other aged 20 years or older. Responses were anonymous and resulted in the collection of 119 effective cases for households, a response rate of 39.0%, and 202 effective cases for family members, a response rate of 33.1%. This flat is called "site1" for convenience.

The other questionnaire survey was done on residents in the Nakamachi survey area, who were all living in detached houses. This area verges on the town center, and all houses within the area are of almost equal distant from the railway station. The survey conducted just the same way as for the flat above, except for the number distributed here, 443 households. Responses resulted in the collection of 176 effective cases for households, a response rate of 39.7%, and 303 effective cases for family members, a response rate of 34.2%. This survey area is called "site2".

Note that most workers who have jobs in city centers in Japan depend on public transportation for commuting. This holds true for both sites. Therefore, it is important that site1 is within a few minutes' walk of the subway station, but site2 is a fifteen minutes' walk along a steep slope to the railway station, although bus services are available for this journey. Not a few people go to the subway station by bus or their own cars in order to commute to the city centers of Kobe or further to Osaka.

3. 2 Viewpoint of analysis

There are various definitions of lifestyle. Bell (1968) sees lifestyle as the orientation of households with respect to behavior from a long term perspective. Michelson (1970) insists that each household is assumed to choose the living environment which best suits its lifestyle. They consider lifestyle from a household perspective. On the other hand, lifestyles have a personal aspect, as well. The degree of satisfaction with a place of residence depends on how it eases the practice of one's lifestyle (Garling et al 2002). In this case, lifestyle is the way one spends amounts of time on fraternizing, hobbies, cultural events, or outings in the countryside. Ge et al (2006) elucidated the concept of a "residential lifestyle" from the perspective of the interaction among choices of a place of residence, preference for the place, satisfaction

with the place and lifestyle. Thus, they defined residential lifestyle as the way of life related to residence features such as consumption of time, space and money. Place of residence is generally determined by the dominant lifestyle in each household and then compromises are required among family members who prefer different lifestyles. Therefore, each household member usually has a different assessment of the living environment. This paper focuses on personal evaluations of the living environment and then details various personal lifestyles. This is because a new city form suggested here needs to be sustainable not only in the maintenance of spatial structure but also in the realization of an individual life values.

Along with the place of residence selected, a spatial distribution of societal resources[15] is established outward from there. Accompanying such a distribution, the total amount of utilizable resources is determined by substantial and institutional restraints, and by the limitation of held resources[16]. In this paper the total amount of utilizable resources is defined again as "living environment[17]". Lifestyle is also again defined as the way people set needs or desires for achievement of their life values and meet them using societal and held resources (Ueno 2006). Choice of place of residence is the basis for one's lifestyle and simultaneously evaluation of the living environment is part of the lifestyle. Thus, living environment as well as its evaluation is a personal and subjective concept.

In this study, those who prefer a suburban lifestyle are called "S-LS" and those who prefer an urban lifestyle "U-LS". In the questionnaire, respondents were asked to choose one preference among three possible responses: "Visiting city centers in order to get urban services when demanded, while living in an area with many amenities.", "Visiting suburbs or the countryside in order to enjoy amenities when desired, while living in an area with many conveniences.", and "neither". The first two choices correspond to S-LS and U-LS, respectively. It is surely an ideal to live in a place blessed with both factors. However, there are few places as such and ordinary households, to some extent, compromise on their choice of a place of residence. Thus,

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[15] These are useful things for a person to solve the problems in his life; market goods, public goods and free goods.

[16] These are things under one's personal control, which are used together with societal resources to solve the problems; belongings, money, house, estate, human relationships, skills, qualifications, rights, knowledge, strength, free time, etc. They include "capability" and "human capital", respectively advocated by Sen (1993) and by Becker (1976).

[17] This concept focuses not on activities but resources and includes goods purchased by web shopping at home. That is why it embraces an "action space", defined as the area within which an individual makes locational decisions, such as where to shop, which house to purchase, and which church to attend (Johnston et al 2000).

this paper proposes that people with different lifestyle preferences are living together in the same sites and even in the same households[18], and they are facing difficulties stemming from a compromise as well as defects of living environment.

At a given point in time, people assess their own living environment based on how many and to what extent necessary resources have been supplied to them, from the viewpoint of achievement of life values or expectation of such (Wolpert 1965). It goes without saying that they choose their present domiciles by making such assessments ahead of time (Golledge et al 1972). Despite this fact, problems in life and held resources always vary at each stage of life and for economic reasons, while the distribution of societal resources fluctuates through market mechanisms and in response to public policy decisions. Moreover, one's preference for the factors varies due to various life-course events, such as aging, marriage, change of family composition, etc. (Abu-Lughod et al 1960). There are two ways to escape from such troublesome situations. One is to move or migrate. This changes the spatial distribution of societal resources centering on the place of residence and then increases utilizable resources. The other is to compromise with the present conditions due to a costly situation, as long as they are kept within their satisfaction. People strive to have as satisfactory living environment as possible, by means of adjusting one's life design, upgrading held resources, and developing available societal resources, etc. (Brown et al 1970). These are also the residents' behaviors focused on in this paper[19].

In this study, site1 is posited as a new type of residential place in the suburbs, where people solved some of the problems they had at former places of residence by migrating. However, they are now probably facing different problems in their new life. On the other hand, site2 is posited as an ordinary residential place in the suburbs, where about 60% of the residents have lived there for more than twenty years. They are probably facing various problems caused by the progress of time and are simultaneously striving to solve them. This paper compares residents' evaluation of the living environment at site1 with those at site2 in order to characterize the new type of residential place.

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[18] People with a different lifestyle are observed in both urban and rural areas, and the evaluation of living environment reflects a lifestyle (Ueno 1999).

[19] From a macro-and long-term perspective, migration can improve the living environment through the efforts of local governments as Tiebout (1956) insisted. From a reverse perspective, however, migration has another aspect that residents consume livability, lessen it and then move to other places. In the United States, for example, it is often observed that people rush to cities highly ranked in livability, resulting in sprawls and traffic congestion, subsequently to spoil livability. This suggests that sustainable livability needs to be fostered by interactions between residents and their livening environment.

Table 9 Former places of residence

	Site 1	Site 2
No. of cases	119	176
Suburbs	69.7	40.3
(Seishin NT)	(26.9)	–
Old area	9.2	22.2
West zone	5.0	13.1
East zone	4.2	9.1
Neighboring area	8.4	18.2
West area	4.2	5.7
Northwest area	3.4	5.7
Eeast area	0.8	6.8
Others	10.1	11.4
N.A.	2.5	8.0
Total	100.0	100.0

Note1) Underlines indicate significantly higher figures at the level of 5%. This holds for all of the following tables, as well.

Note2) These numbers are percentages, as is those for Tables 10–20 and 37–38 as well.

Table10 Former types of housing

	Site 1	Site 2
No. of cases	119	176
Detached houses	32.8	48.3
Flats	23.5	19.9
Rented flats	27.7	11.9
Company housing	9.2	8.5
Rented detached houses	2.5	4.5
Others	2.5	1.1
N.A.	1.7	5.7
Total	100.0	100.0

Table 11 Period of residence at site2

No. of cases	176
Under 5	6.3
5–9	8.5
Before the earthquake	(80.1)
10–14	8.5
15–19	14.8
20 and over	56.8
N.A.	5.1

4. Analysis of survey data

4.1 Profile of respondents

Table 9 shows the former place of residence of households. The share for suburbs is 69.7% at site1, much larger than the 40.8% at site2, but is the reverse for the old area and the neighboring area, especially in the east area. It is remarkable that Seishin NT was 26.9% of the total and 38.6%[20] of the suburbs at site1. These symbolize the latest change in the relation between the old area and the suburbs. Site2 reflects a spatial pattern of migration observed before the earthquake, although it indicates a new trend of more migration within the suburbs. This suggests that various places of residence are competing to attract migrants within the same town as well as the suburbs. According to Table 10, the number of households which moved from a detached house at site 1 was over 30% and that who moved from a flat was about 50%. The reverse is observed at site 2. One third of the households at site1 moved from a detached house to a flat, and the same percentage from a flat to a detached house at site2. In addition, around half of the households at site2 moved from a detached house.

As for period of residence at site2 (Table 11), approximately 80% have lived there longer than the number of years that have passed since the earthquake. This means most residents moved there when population inflow to the suburbs of Kobe was stably large. Table 12 exhibits few differences in the number of family members except for

[20] This is calculated through dividing 26.9% (Seishin NT) by 69.7% (suburbs).

Table12 Number of family members

	Site 1	Site 2
No. of cases	119	176
Mean	2.6	2.8
One	7.6	10.8
Two	39.5	32.4
Three	26.9	25.0
Four	17.6	14.2
Five	1.7	6.8
Six	–	2.8
N.A.	6.7	8.0
Total	100.0	100.0

Table13 Family composition

	Site 1	Site 2
No. of cases	119	176
Single	7.6	8.0
Couple	39.5	35.2
Couple & Children	43.7	38.6
Couple & Parents	3.4	3.4
Couple, Children & Parents	1.7	5.1
Others	1.7	1.7
N.A.	2.5	8.0
Total	100.0	100.0

Table15 Sex

	Site 1	Site 2
No. of cases	202	302
Male	43.1	46.0
Female	54.5	52.3
N.A.	2.5	1.7
Total	100.0	100.0

Table 14 Possession of cars

	Site 1	Site 2
No. of cases	119	176
Yes	79.0	81.8
No	18.5	10.2
N.A.	2.5	8.0
Total	100.0	100.0

Table 16 Age

	Site 1	Site 2
No. of cases	202	302
20–39	7.4	1.0
40–49	20.8	7.6
50–59	15.3	28.8
60 and over	14.4	36.1
N.A.	2.5	1.3
Total	100.0	74.8

Table 17 Occupation

	Site 1	Site 2
No. of cases	202	302
Independent business	2.0	7.6
Full time employees	41.6	21.5
Part timer	7.9	10.9
Full time housewife	25.2	28.1
Unemployed	15.8	25.5
Others	2.5	3.6
N.A.	5.0	2.6
Total	100.0	100.0

more than five members between the two sites. Two or three members are dominant. Few differences in family composition between the two sites are observed in Table 13, as well. "Couple" and "couple & children" are dominant. Concerning possession of cars, which is an essential means of transportation in suburbs (Table 14), the numbers at site2 are a little higher than at site1, probably due to the difference in the level of public transport services. The main attributes of sex, age and occupation are shown in Tables 15-17, respectively. People in their 30s and 40s are dominant with a share of 51.0% at site1. At site2, people in their 50s and 60s are dominant with a share of 64.9%. There are gaps in the number of "full time employees" and "unemployed" between the two sites probably due to differences in the degree of aging. Other than that, there are no remarkable differences.

Table 18 shows the percentage of respondents claiming the two different lifestyles at each site. The share of S-LS at site2 is larger than at site1. The share is reverse for U-LS. Realization of lifestyle is shown in Table 19. There is little difference in the

Table 18 Two kinds of lifestyles

	Site 1	Site 2
No. of cases	202	302
S-LS	37.1	73.8
U-LS	53.0	13.6
Neither	8.9	10.6
N.A.	1.0	2.0
Total	100.0	100.0

Note) S-LS are those who prefer a suburban lifestyle. U-LS are those who prefer a urban lifestyle

Table19 Realization of lifestyles

	Site 1		Site 2	
	S-LS	U-LS	S-LS	U-LS
No. of cases	75	107	223	41
Enough	21.3	26.2	40.4	7.3
Somewhat	52.0	43.9	44.4	24.4
Not at all	4.0	6.5	6.7	61.0
Neither	5.3	5.6	2.2	4.9
N.A.	17.3	17.8	6.3	2.4
Total	100.0	100.0	100.0	100.0

Table20 Combination of lifestyles in the same household

	Site1	Site2
No. of cases of the two respondents	86	124
	100.0	100.0
Same lifestyle	65.1	75.8
S-LS × S-LS	23.3	65.3
U-LS × U-LS	38.4	4.8
Neither × Neither	3.5	5.6
Different lifestyle	34.9	24.2
S-LS × U-LS	23.3	12.1
S-LS × Neither	3.5	8.9
U-LS × Neither	8.1	3.2

percentage between the two lifestyles at site1. "Enough" or "somewhat" make up about 70% of the total. On the other hand, S-LS give far more affirmative responses than U-LS at site2. Site2 is a resident place for S-LS, and U-LS are clearly forced to compromise. Site1 has conditions for both lifestyles to live as they please and demonstrates a new way of living in the suburbs, while site2 shows a traditional way of living as expected by town planner. Table 20 exhibits combinations of respondents' preferred lifestyles within the same household in households which had two respondents. At site1, the shares of S-LS×S-LS, U-LS×U-LS and S-LS×U-LS are 23.3%, 38.4% and 23.3%, respectively. On the other hand, at site2, they are 65.3%, 4.8% and 12.1%, respectively. From the viewpoint of households, site1 has a well balanced composition of these two kinds of people with different lifestyle preferences. Site1 has a larger share of S-LS×U-LS than site2. This agrees with the results in Table 19. In other words, site1 does not so strongly force family members to compromise on practicing their preferred lifestyles.

Reasons for residents at site1 having left their former houses are shown in Table 21[21]. These correspond to the problems they thought much of before migrating. As a whole, highly ranked reasons concern inconveniences for urban services. Focusing on scores of "detached houses", they are higher than those of the others concerning inconveniences for shopping, medical treatment and association with friends, and further physical difficulties in daily life, such as "in maintenance of houses"[22] and

[21] Eleven reasons for choice of site1 were offered to respondents. They were asked to choose one of four grades of importance for each reason; very important, important, somewhat important and unrelated when they decided to leave. Then, 10, 5, 3 and 0 were allocated to those answers, respectively to calculate degree of importance.

[22] This score is especially high for residents in their 50s and older among the four groups, 20s, 30s,

Table 21 Rankings of reasons for households at site1 having left their former homes

	Total	Detached houses	Others	t-value	
No. of cases	119	42	75		
Inconvenience for shopping	3.33	4.29	2.79	2.036	*
Inconvenience for a station or a bus stop	3.01	3.81	2.56	1.786	
Inconvenience for medical treatments	2.77	3.82	2.19	2.210	*
Incovenience for going to work or school	2.63	2.97	2.43	0.756	
Uneasiness in security	2.34	2.83	2.07	1.269	
Difficulty in maintenance	2.01	4.02	0.88	5.272	**
Slopes here and there in the vicinity	1.94	2.02	1.89	0.197	
Difficulty in going up and downstairs	1.63	2.95	0.89	3.435	**
Decrease in family members	1.31	2.42	0.69	2.738	**
Increase in family members	1.28	0.63	1.65	-2.036	*
Incovenience for associating with relatives	1.28	1.59	1.10	1.000	
Poor educational environment for children	1.19	0.47	1.59	-2.613	*
Troublesome relationships with neighbors	0.83	1.25	0.60	1.437	
Incovenience for associating with friends	0.65	1.33	0.27	2.216	*

Note1) Figures are the degree of importance
Note2) Missing values were replaced by a mean.
Note3) A two-sided t-test was carried out. Underlined figures are larger than corresponding figures in a comparison between detached houses and the others. This holds for all of the following tables showing a comparison of means between two groups.
Note4) Rankings are according to figures of the total. This holds for Table 22.

"in going up and down stairs"[23]. The same is true for "decrease of family members"[24]. The reverse is observed for "increase of family members" and "poor educational environment for children". This reflects the aging of residents in detached houses[25]. It is notable that "uneasiness in security" has a relatively high score independent of type of home. This probably reflects the spread of crimes these days not only in the suburbs of Kobe but also all over Japan.

Table 22 shows the reasons for residents having migrated to site1[26]. Convenience for several urban services is ranked highly, and also "well maintained neighborhood and quietness" is ranked relatively high, comparable to "convenience for visiting the central district"[27]. This also suggests site1 has amenities as well as conveniences. Households escaped from inconveniences and have obtained conveniences by migration. "Very near to a subway station and a bus terminal" is ranked highest. This symbolizes the great dependence of residents' lives on public transportation. It seems to stem from the difference in age composition that the scores for "living on the same

40s, 50s and more than 60s (Ueno 2005).

[23] These facts are shown in other papers (e.g. Omi 2003)

[24] This reason has the largest score for those in their 50s among the same groups above (Ueno 2005).

[25] The share of householders in their 50s and older is 59.0% of the detached houses and 35.6% of the others.

[26] The way to calculate importance is as same as in footnote 20.

[27] These reasons have no difference in scores among ages in the same survey (Ueno 2005)

Table 22 Rankings of reasons for households having migrated to site1

	Total	Detached houses	Others	t-value	
No. of cases	119	42	75		
Very near to a subway station and a bus terminal	9.11	8.95	9.20	-0.603	
Convenicence for medical treatments	7.55	7.73	7.45	0.485	
Convenicence for shopping	7.54	7.44	7.60	-0.286	
Convenicence for going to work and school	5.88	4.97	6.40	-1.954	
Well maintained neighborhood and quietness	5.50	5.00	5.78	-1.197	
Convenicence for visiting the central district	5.38	5.26	5.45	-0.286	
Adequate security services	4.88	5.37	4.61	1.203	
Living on the same floor	3.47	4.99	2.62	3.292	**
Good educational environment for children	2.95	0.90	4.09	-5.654	**
Relatives are living nearby	2.50	2.06	2.75	-1.042	
A nursery school is annexed	1.23	0.45	1.67	-3.215	**

Note1) Figures are the degree of importance
Note2) Missing values were replaced by a mean.

floor", "good educational environment for children" and "a nursery school is annexed" are different for detached houses than the others. As a whole, conveniences and living environment inclusive of security are regarded as important[28]. These show that migration generally solved the problems shown in Table 21.

Table 23 shows ratios for respondents' choice of each reason for migration to site2. "Housing sites and houses were reasonably priced", "good natural environment" and "well maintained neighborhood and quietness" have large scores, which "convenience for shopping, medical treatment, education, etc." have a small score[29]. They were surely attracted by the amenity of reasonable price. This shows they preferred a suburban lifestyle in those days. Considering Tables 18, 19 and 20, people's preferred lifestyles could hardly change. This shows they solved many of the problems they had so far by migrating. In summary, migration to site1 was induced by seeking for conveniences, while that to site2 for amenities.

4.2 Evaluation of living environment

Table 24 shows respondents' evaluation[30] of livability and of thirteen conditions comprising livability at the two sites. Livability of site1 is rated higher than at site2. Differences are observed in most conditions, except for "houses", "neighboring parks"

[28] Flats are believed to be more defensive against crimes than a detached house. The former recently provides full safety services and only asks residents to lock up one door.

[29] "Expectation for the extension of a subway" is ranked fourth. The municipal subway now terminates at the Seishin NT. However, Kobe City had a plan to extend the subway to some alternative directions in the west or northwest area of the city before the earthquake. One of them was an extension toward the Sakuragaoka NT. Nowadays the city has given up the extension due to the financial issues.

[30] They were measured using a five-point scale; "satisfied", "somewhat satisfied", "neither", "a little unsatisfied" and "unsatisfied". Scores of 2, 1, 0, -1 and –2 respectively were allocated.

Table 23 Rankings of reasons for households having migrated to site2

	Ratio
No. of cases	167
Housing sites and houses were reasonably priced	0.52
Good natural environment in the vicinity	0.43
Well maintained neighborhood and quietness	0.43
Expectation of the extension of a subway	0.28
Good neighborhood relations and ambience	0.25
Good educational environment for children	0.18
Convenience for shopping, medical treatimen, education, etc.	0.09
Friends are living nearby	0.07
Convenicence for going to work and school	0.07
Parents are living nearby	0.05
A parent's owned house to live in together	0.01

Note1) Respondents were allowed to choose multiple answers.
Note2) Figures are a ratio of responses.

Table24 Evaluation of the living environment at two sites

	Site1	Site2	t-value	
No. of cases	202	302		
Livability	1.57	1.18	6.507	**
Convenience for shopping	1.65	0.64	12.784	**
Convenience for leisure activities	0.85	0.10	8.125	**
Convenience for medical treatment	1.07	0.15	9.900	**
Access to working places and schools	1.16	-0.49	18.607	**
Use of public transportation	1.35	-0.54	19.788	**
Houses	1.12	1.08	0.569	
Maintenance of neighborhood and quietness	0.89	1.06	-2.290	*
Public security	0.72	0.26	5.340	**
Neighboring parks	0.99	1.01	-0.228	
Natural environment in the vicinity	1.06	1.03	0.542	
Community activities	0.15	0.42	-4.097	**
Neighborhood human relationships	0.25	0.66	-5.995	**
Access to the central district	1.13	-0.62	19.240	**

Note1) Figures are a mean.
Note2) Missing values were replaced by a mean in the analysis.

and "natural environment in the vicinity", and site2 is rated more highly than site1 for "landscape and ambience in the vicinity", "community activities" and "neighborhood human relationships". It is notable that the scores are strongly negative at site2 for "access to working places and schools", "use of public transportation" and "access to the central district[31]. Despite the fact that residents at site2 made light of convenience when they migrated, they are now very dissatisfied with the level of conveniences for several activities. This tells us that convenience has increased in importance for them due to changes in their lives. Inconveniences for public transportation characterize

[31] This superiority of site1 is through direct access to the central district by the subway and the road for cars only.

Table25 Evaluation of the living environment by lifestyles at two sites

Lifestyles	Site 1			Site 2		
	S-LS	U-LS	t-value	S-LS	U-LS	t-value
No. of cases	75	107		223	73	
Livability	1.44	1.68	-2.936 **	1.27	0.92	3.680 **
Convenience for shopping	1.61	1.69	-0.780	0.68	0.52	1.034
Convenience for leisure activities	0.75	0.87	-0.845	0.22	-0.27	3.391 **
Convenience for medical treatment	1.11	1.04	0.445	0.18	0.06	0.797
Access to working places and schools	1.05	1.24	-1.405	-0.49	-0.54	0.355
Use of public transportation	1.30	1.42	-0.824	-0.50	-0.69	1.256
Houses	1.04	1.17	-1.033	1.09	1.06	0.286
Maintainance of neighborhood and quietness	0.87	0.88	-0.089	1.10	1.00	0.968
Public security	0.83	0.65	1.353	0.27	0.22	0.334
Neighboring parks	1.11	0.92	1.661	1.04	0.90	1.373
Natural environment in the vicinity	1.07	1.05	0.176	1.06	0.96	0.983
Community activities	0.05	0.27	-2.339 *	0.45	0.33	1.128
Neighborhood human relationships	0.13	0.36	-2.230 *	0.70	0.58	0.997
Access to the central district	1.01	1.18	-1.177	-0.57	-0.78	1.426

Note1) Figures are a mean.
Note2) Missing values were replaced by a mean in the analysis.

Table26 Relation between the realization of a lifestyle and the evaluation of livability

	No. of cases	Livability	No. of cases	Livability	t-value
		Enough		Somewhat	
S-LS (site1)	16	1.75	39	1.36	2.771 **
U-LS (site1)	28	1.96	47	1.62	4.054 **
S-LS (site2)	90	1.49	115	1.06	4.606 **
		Somewhat and over		Neither and under	
U-LS (site2)	13	1.23	27	0.74	2.014 +

Note) + shows a significance level of 10%.

site2, because means of commuting and visiting the central district depend greatly on it. On the other hand, high satisfaction with community suggests that residents have fostered good human relationships over many years of living together. Site1 has as an overall better living environment than site2, probably because it is located in a well planned and convenient place, and consequently meets demands of residents.

Table 25 exhibits the comparison of the evaluation of living environment between the lifestyles at each site. There are no differences in the conditions but a few differences between the lifestyles. However, site1 is more livable for U-LS, and so is site2 for S-LS. This suggests that there are other conditions influencing livability. Table 26 indicates livability also depends on the degree of the realization of lifestyle. It is clearly due to the low degree of the realization as shown in Table 19 that U-LS at site2 are especially dissatisfied with livability. This shows the evaluation of living environment reflects the gap between ideals and realities in practicing a preferred lifestyle.

Table 27 Prospect for residents to continue to live at sites, as percentages

	Site1		Site2	
	S-LS	U-LS	S-LS	U-LS
No. of cases	75	107	220	41
Livability	1.44	1.68	1.27	0.93
Stay throughout life	52.0	64.5	57.3	34.1
Stay for the time being but leave someday	20.0	10.3	15.9	34.1
Neither	28.0	25.2	26.8	31.7
Total	100.0	100.0	100.0	100.0

Additionally, Table 27 exhibits prospects for residents to continue to live at their sites. Despite the difference in livability between lifestyles at site1, no difference in the composition of responses is observed. "Stay throughout life" is rated most highly for both lifestyles probably due to the high level of livability and also to short periods of residence. This hints that changes are occurring in the conventional view that people start their adult life living in rented flats and later move to detached houses through owner-flats, considering one third of migration from detached houses as shown in Table 10. On the other hand, the composition of responses at site2 reflects the difference in livability. U-LS gave more responses of "stay for the time being but leave someday" and also fewer responses of "stay throughout life" compared to S-LS. Site2 is again proved to be unsuitable for U-LS, who compromise on living there for whatever their reasons.

As livability reflects realization of a preferred lifestyle, cases with a response of "enough" or "somewhat" on realization are focused on hereafter. They are regarded to be somehow practicing a preferred lifestyle. Further, as there are hardly any cases of U-LS at site2, they are not considered below. S-LS and U-LS at site1 as well as S-LS at site2 are now to be called "S-LS1", "U-LS1" and "S-LS2", respectively. This paper compares these groups on their evaluation of living environment, clarifies the characteristics of the sites and groups, and tries to offer some suggestions concerning a new city form.

Attributes expectedly influencing comparisons among lifestyles were examined by the Pearson's Chi-square test. Table28 shows that no differences were found for any of attributes between S-LS1 and U-LS1. It can be concluded that these groups are homogeneous in these attributes. On the other hand, differences were observed for "age", "occupation" and "possession of cars" between S-LS1 and S-LS2. These pairs are not homogeneous. Since coefficients of concordance are relatively small for

"occupation" and "possession of cars", the influence of age was noted in this paper[32]. Table 16 shows that site1 has many respondents under fifty years old and to the contrary that site2 has many respondents aged fifty years and over. The six age groups were again categorized into two groups; under fifty and fifty and over. The relation between S-LS1 and S-LS2 was again examined using the Pearson's Chi-square test. The coefficient of concordance was 0.357 at a significance level of 1%, which is almost equal to the figure shown in Table 28. This proves that the categorization is reasonable.

Table 28 Comparison of attributes between pairs of groups

	S-LS1 & U-LS1	S-LS1 & S-LS2	
Sex	0.116	0.031	
Age	0.209	0.380	**
Occupation	0.227	0.228	*
Family composition	0.275	0.152	
Commuting	0.120	0.072	
Possesion of cars	0.130	0.194	**

Note1) Figures are coefficients of concordance.
Note2) Commuting is whether respondents are going by some transportation means to their working places or not.

As Table 24 shows, assessment of living environment is very different between sites. However a principal component analysis was applied to the total responses because a comparison can be done between S-LS1 and S-LS2. For this purpose, a dummy variable to distinguish sites was used; 1 for site1 and 0 for site2. Results are shown in Table 29. Three components, with an eigenvalue over 1, were extracted. The first component is called the "convenience", because items with a large factor loading are "use of public transportation", "access to the central district", "access to working places and schools", "convenience for shopping", etc. The second component is called the "amenity", including such items as "maintenance of neighborhood and quietness", "neighboring parks", "natural environment in the vicinity", etc. The third component is called the "community", made up of items such as "neighboring human relationships" and "community activities". This suggests livability is described as a function of these components.

Concerning convenience and amenity, the more satisfied people are with conditions comprising each factor, the larger the factor score is. However, such a relation does not hold true for community. Some people like close human relationships, others do not. It should be further noted that unlike the other factors, it is difficult for community to be built through town planning and also to assess before migration. The dummy variable has a large factor loading on convenience, a not so large and negative one on community and nearly null one on amenity. These show that the dummy variable is strongly correlated with convenience, weakly and inversely with community

[32] The coefficient of concordance between age and period of residence at site2 is 0.69. This suggests the influence of age roughly includes that of period of residence.

Table29 Results of a principal component analysis

	Convenience	Amenity	Community
Dummy variable (site1)	0.768	-0.033	-0.372
Use of public transportation	0.866	0.138	-0.084
Access to the central district	0.846	0.193	-0.069
Access to working places and schools	0.829	0.020	-0.024
Convenience for shopping	0.734	0.123	0.136
Convenience for medical treatments	0.702	0.229	0.205
Convenience for leisure activities	0.671	0.178	0.248
Maintenance of neighborhood and quietness	-0.055	0.822	0.095
Neighboring parks	0.102	0.751	0.222
Natural environment in the vicinity	0.142	0.705	0.283
Public security	0.304	0.681	-0.034
Houses	0.138	0.591	0.073
Neighborhood human relationships	-0.034	0.150	0.812
Community activities	0.076	0.241	0.792
Eigenvalue	4.38	2.79	1.70
Cumulative contribution ratio	0.31	0.51	0.63

Note1) Missing values were replaced by a mean in the analysis.
Note2) No. of cases are 504 including all responses.
Note3) Figures are a factor loading.
Note4) Varimax rotation was carried out.

and not at all with amenity. In other words, convenience can be a clear indicator distinguishing the two sites because it is provided only in limited places. On the other hand, amenity cannot, probably because it is easily provided anywhere in the suburbs through town planning. Community is located between the two factors due to the reason given above.

Table 30 shows comparisons of means of three factor scores among lifestyles as well as sites. The scores were normalized, with a mean of 0 and a standard deviation of 1 for all responses. The mean for each group indicates a relative level of satisfaction with its corresponding factor. Two subgroups of age show the same patterns of differences in the three factors among S-LS1 and S-LS2. This means that age need not be considered in comparisons between those lifestyles. Site1 has a much larger score than site2 for convenience, but the opposite is true for community. This reconfirms that site1 is a very convenient location and site2 has fostered a good community[33].

S-LS1 are less satisfied with convenience than U-LS1. There are two aspects for residents to assess convenience in the suburbs. One is whether they can easily utilize facilities for daily life in their neighborhoods. The other is whether they can easily go somewhere, such as to the central district, to compensate for the lack of services at the site. They are referred to as "convenience 1" and "convenience 2", respectively. Each

[33] According to an interview with a representative of the residents' association in Sakuragaoka, site2 has fostered a close community.

Table 30 Comparisons of the factor scores between the sites as well as lifestyles

	Age groups	No. of cases	Convenience	Amenity	Community
Site1		137	0.94	0.02	-0.42
Site2		211	-0.53	0.06	0.41
t-value			22.736 **	-0.433	-8.138 **
S-LS1		55	0.81	0.04	-0.69
U-LS1		75	1.04	0.00	-0.17
t-value			-2.620 **	0.226	-3.490 **
S-LS1	Total	55	0.81	0.04	-0.69
S-LS2		189	-0.53	0.06	0.40
t-value			15.513 **	-0.152	-8.285 **
S-LS1	Under 50	30	0.87	-0.11	-0.60
S-LS2		29	-0.71	-0.21	0.19
t-value			10.950 **	0.469	-4.285 **
S-LS1	50 and over	24	0.74	0.29	-0.81
S-LS2		159	-0.51	0.11	0.43
t-value			11.442 **	0.912	-5.783 **

consists of some of six conditions comprising convenience shown in Table 29[34].

With a definition of a lifestyle, S-LS1 position the town center at site1 as the main facility for basic services and visit somewhere else, especially the central district, for high-grade services. U-LS1, on the other hand, position the town center as an adequate facility for services and so they need not visit somewhere else so regularly as S-LS1. Thus S-LS1 are supposed to have higher demand standards for convenience 2 than U-LS1. Table 31 exhibits comparisons of average scores of conveniences 1 and 2 between lifestyles. S-LS1 are less satisfied with convenience 2 on average and further with "access to the central district" independently than U-LS1. This suggests visiting elsewhere, especially the central district, for necessary services is a little troublesome for S-LS1 and as a result convenience is evaluated low on the whole[35]. This positioning of the town center in two ways enables those with different lifestyle preferences to live close together with in households as well as at the same housing site. Here, there seem to be some clues of a new relation between the suburbs and the central district, and further of a sustainable city form. On the other hand, S-LS2 position the town center at site2 in the same way as S-LS1 do. However, S-LS2 are far less satisfied with both conveniences than S-LS1, despite their having migrated to the site regardless of conveniences. This reflects not only gaps in the level of facilities between the two sites,

[34] Six conditions were grouped into conveniences 1 and 2 in advance by a cluster analysis.
[35] Many of users generally complain of the thirty-minute subway ride for the distance of 22Km to the central district.

Table 31 Comparison of the scores of the two kinds of convenience between lifestyles

No. of cases	S-LS1 55	U-LS1 75	t-value		S-LS1 55	U-LS1 189	t-value	
Convenience 1	0.49	0.69	-1.583		0.49	-0.22	6.765	**
Convenience for shopping	0.48	0.65	-1.592		0.48	-0.27	7.108	**
Convenience for leisure activities	0.26	0.54	-1.864	+	0.26	-0.07	2.306	*
Convenience for medical treatment	0.49	0.55	-0.388		0.49	-0.22	5.670	**
Convenience 2	0.71	0.97	-2.315	*	0.71	-0.51	11.126	**
Access to working places and schools	0.67	0.88	-1.717	+	0.67	-0.50	10.400	**
Use of public transportation	0.67	0.87	-1.664	+	0.67	-0.47	9.358	**
Access to the central district	0.60	0.88	-2.419	*	0.60	-0.43	8.917	**

Note) Figures are a mean of the normalized five-scale scores shown in the footnote 28.

but possibly a change in people's attitudes toward conveniences. Moreover, as Table 32 shows, convenience 2 has a much lower score than convenience 1, but the reverse is the case for S-LS1 and U-LS1. This means site2 has very poor conditions to support visiting elsewhere compared to site1.

Referring to Table 30, S-LS1 are less satisfied with community than U-LS1 and also far less than S-LS2. This gap possibly stems from differences in the nature of community among the two sites as well as in lifestyle. U-LS1 do not like a close community. S-LS1 and S-LS2 both feel the opposite, but differences in the maturity of each community between sites bring about gaps in the evaluation. No difference is found for amenity among sites as well as lifestyles. All lifestyles are enjoying the amenities to the same extent.

If there was a gap in the evaluation of a factor between "enough" and "somewhat" shown in Table 19, the factor could condition the realization of a preferred lifestyle. In Table 33, livability and realization are mutually dependent, and the gap in livability is large for all lifestyles. No difference in convenience is observed among the lifestyles. There is no

Table 32 Comparison of the satisfaction level between the two coveniences

No. of cases	S-LS1 55	U-LS1 75	S-LS2 189
Convenience 1	0.49	0.69	-0.22
Convenience 2	0.71	0.97	-0.51
t-value	-2.876 **	-3.124 **	4.934 **

Table 33 Comparison of the satisfaction level between two responses of "enough" and "somewhat"

	Enough	Somewhat	
	S-LS1		t-value
No. of cases	16	39	
Livability	0.60	0.03	2.771 **
Convenience	0.97	0.75	1.467
Amenity	0.44	-0.12	2.218 *
Community	-0.64	-0.72	0.325
	U-LS1		t-value
No. of cases	28	47	
Livability	0.92	0.41	4.054 **
Convenience	1.16	0.97	1.730
Amenity	0.60	-0.36	3.836 **
Community	0.15	-0.36	2.535 *
	S-LS2		t-value
No. of cases	90	99	
Livability	0.22	-0.39	4.563 **
Convenience	-0.52	-0.55	0.300
Amenity	0.31	-0.17	3.820 **
Community	0.49	0.31	1.291

Note) All scores are a normalized on each variable.

Table 34 Regression analysis on each lifestyle

Explanatory variables	S-LS1 Standard coefficient (t-value)	U-LS1 Standard coefficient (t-value)	S-LS2 Standard coefficient (t-value)
No. of cases	52	73	169
Convenience	0.667 **	0.333 **	−0.002
	6.851	2.973	−0.034
Amenity	0.215 *	0.471 **	0.408 **
	2.209	4.859	6.429
Community	0.102	−0.008	0.432 **
	1.074	−0.073	5.867
Adjusted coefficient of determination	0.544 **	0.358 **	0.324 **
F-value	21.305	14.365	27.890

evidence that the level of convenience conditions the degree of realization independent of lifestyle. In contrast, the rating of enough is higher than somewhat for amenity for all lifestyles. It is fair to say that the high amenity is a necessary condition to realize an urban lifestyle as well as a suburban lifestyle. No difference is observed for community for S-LS1 and S-LS2. Community can not condition the realization of a suburban lifestyle independent of the level of satisfaction as well as locality. On the other hand, the rating of enough is larger than that of somewhat for community for U-LS1. Community can condition the realization of an urban lifestyle. Urban lifestyles seem to be oriented to somewhat distant community relationships.

4.3 Regression analysis

In order to clarify the difference in structure of evaluation of livability among the three lifestyles, regression analyses were conducted with convenience, amenity and community as explanatory variables. A regression analysis was firstly done on each lifestyle. Results in Table 34 roughly show the characteristics of each lifestyle. Convenience and amenity have an influence on livability for S-LS1 and U-LS1, but community does not. On the other hand, so do amenity and community for S-LS2, but not convenience. It is notable that amenity has an influence on all lifestyles.

Secondly, two regression analyses were carried out with dummy variables to search in detail for the differences in structure among the three lifestyles. The first regression adopted a lifestyle as a dummy variable on a constant and three coefficients. In addition, the second regression adopted age as a dummy variable on a constant. Coefficient parameters with suffixes i and j correspond to a reference group and a main group, respectively. Thus, the first regression equation was set as shown below.

$$L_1 = \alpha_{1j} D_1 + \beta_{1i} x_1 + (\beta_{1j} - \beta_{1i}) D_3 + \beta_{2i} x_2 + (\beta_{2j} - \beta_{2i}) D_4 + \beta_{3i} x_3 + (\beta_{3j} - \beta_{3i}) D_5 + \varepsilon_1$$

Here, the dummy variables are defined as:

$$D_1 = \begin{Bmatrix} 0 \text{ for the S-LS1} \\ 1 \text{ for the U-LS1} \end{Bmatrix}, \quad D_3 = \begin{Bmatrix} 0 \text{ for the convenience of the S-LS1} \\ x_1 \text{ for the convenience of the U-LS1} \end{Bmatrix},$$

$$D_4 = \begin{Bmatrix} 0 \text{ for the amenity of the S-LS1} \\ x_2 \text{ for the amenity of the U-LS1} \end{Bmatrix} \quad D_5 = \begin{Bmatrix} 0 \text{ for the community of the S-LS1} \\ x_3 \text{ for the community of the U-LS1} \end{Bmatrix}$$

The second regression equation was set as:

$$L_2 = \alpha_{1j} D_1 + \alpha_{2j} D_2 + \beta_{1i} x_1 + (\beta_{1j} - \beta_{1i}) D_3 + \beta_{2i} x_2 + (\beta_{2j} - \beta_{2i}) D_4 + \beta_{3i} x_3 + (\beta_{3j} - \beta_{3i}) D_5 + \varepsilon_2$$

Here, the dummy variables are defined as:

$$D_1 = \begin{Bmatrix} 0 \text{ for the S-LS1} \\ 1 \text{ for the S-LS2} \end{Bmatrix}, \quad D_2 = \begin{Bmatrix} 0 \text{ for the age under 50} \\ x_1 \text{ for the age over and including 50} \end{Bmatrix},$$

$$D_3 = \begin{Bmatrix} 0 \text{ for the convenience of the S-LS1} \\ x_2 \text{ for the convenience of the S-LS2} \end{Bmatrix} \quad D_4 = \begin{Bmatrix} 0 \text{ for the amenity of the S-LS1} \\ x_3 \text{ for the amenity of the S-LS2} \end{Bmatrix},$$

$$D_5 = \begin{Bmatrix} 0 \text{ for the community of the S-LS1} \\ x_3 \text{ for the community of the S-LS2} \end{Bmatrix}$$

Table 35 Comparison of the regression structure between the two pairs of lifestyles

		Regression 1		Regression 2	
	i	S-LS1		S-LS1	
	j	U-LS1		S-LS2	
Explanatory variables	Prameters	Standard coefficient		Standard coefficient	
Constant dummy of a lifestyle (D1)	α 1j	0.571	**	0.186	
	t-value	3.805		1.686	
Constant dummy of age (D2)	α 2j			-0.010	
	t-value			-0.164	
Convenience	β 1i	0.711	**	0.898	**
	t-value	7.578		4.845	
Amenity	β 2i	0.270	*	0.291	**
	t-value	2.443		2.615	
Community	β 3i	0.124		-0.036	**
	t-value	1.188		-0.262	
Coefficient dummy of conveniecne (D3)	β 1j- β 1i	-0.487	**	-0.618	**
	t-value	-2.852		-4.043	
Coefficient dummy of amenity (D4)	β 2j- β 2i	0.050		0.123	
	t-value	0.454		1.118	
Coefficient dummy of community (D5)	β 3j- β 3i	-0.077		0.418	**
	t-value	-0.707		3.246	
No. of cases		120		218	
Adjusted coefficient of determination		0.565	**	0.385	**
	F-value	23.121		17.989	

Note1) A suffix i shows a reference group in a regression.

Note2) ** and * denote a significance level of 1 and 5%, respectively.

Table 35 shows the results. As some coefficient dummies are significant and negative, it is not certain whether corresponding coefficients are positive, negative or null. Using the results in Table 34, these results were sorted out in Table 36, which shows the relation of sizes of parameters between two pairs of groups. U-LS1 have a positive constant on lifestyle, while S-LS1 have a null one. Site1 probably has advantageous conditions, out of consideration here, for U-LS1. S-LS1 and S-LS2 both have a null constant on age. This result denies an influence of age on comparison of the evaluation structure between two lifestyles.

Concerning convenience, S-LS1 have a larger coefficient than U-LS1. In other words, the former react more positively to a change in convenience than the latter in their evaluation of livability. Convenience has no influence on livability for S-LS2. It is very interesting that such a difference is found despite their both preferring a suburban lifestyle. Regarding amenity, all lifestyles have a positive coefficient and show no differences in size between any pair of lifestyles. Amenity has a positive and same degree of influence on livability for not only different lifestyles at the same site, but also for the same lifestyle at different sites. Considering the lack of difference in the level of amenity among each pair, livability can be enhanced through improvement of amenity by means of planning in the suburbs, regardless of lifestyle or site. Concerning community, S-LS1 and U-LS1 have no significant coefficients, while S-LS2 have a positive coefficient[36]. In other words, livability reflects the level of community for S-LS2. It has often been reported that satisfaction with community has much influence

Table 36 Comparison of constants and standard coeffecients between the two pairs of groups

		S-LS1		U-LS1	S-LS1		S-LS2
	No. of cases	55		75	55		186
	Livability	0.20	<	0.60	0.20	>	-0.10
Lifestyle	Constant	0	<	+	0	~	0
Age	Constant				0	~	0
Convenience	Coefficient	+	>	+	+	>	0
	Satisfaction level	0.81	<	1.04	0.81	>	-0.53
Amenity	Coefficient	+	~	+	+	~	+
	Satisfaction level	0.04	~	0.00	0.04	~	0.06
Community	Coefficient	0	~	0	0	<	+
	Satisfaction level	-0.69	<	-0.17	-0.69	<	0.40

Note1) ">"or "<" are a size relation of the coefficients between the pair of groups.
Note2) "~"shows that the size of coefficient is indiscriminate between the pair of groups.
Note3) "0"corresponds to a constant of a standard regression and also a "not significant" coefficient.

[36] At site1, it is possible that a satisfaction level of "neither" on community includes the meaning "no idea" due to the short period of residence. That may be why community has no influence on livability despite S-LS1 being far less satisfied with it, which is different than the case of S-LS2.

on livability (e.g. Ueno 2004). This does not hold for site1, however.

4. 4 Actions to live better

Residents can not always practice a preferred lifestyle. They are simultaneously not passive to the given living environment but strive to meet problems in life in order to live happily. Migration, a way to change the distribution of societal resources, was already considered using Table 27. S-LS and U-LS at site1 had done it by moving to site1 just eight months before the survey. The results exhibit that residents seem to have solved many of their problems independent of lifestyle, and to be generally enjoying their lives at site1 with a low share of those who have an intention to move someday, or 20% of S-LS and 10% of U-LS. On the other hand, about 80% of residents at site1 had lived there more than 10 years and show low levels of livability satisfaction as well as satisfaction with living environment compared to those at site2. Those who have an intention to move someday consist of 15.9% of S-LS and 34.1% of U-LS. The latter seemingly cannot move and compromise on the locality for the time being.

Improvement of utilizable societal resources can also help people to live their preferred lifestyles and is divided into two ways. The first is to enhance the quality of resources in the neighborhood, such as by fostering community, cleaning parks and promenades, maintaining landscapes and ambience, etc[37]. These need residents' participation and cooperation. The second is to visit elsewhere in order to increase utilizable resources (Ueno 2003). The first way, attempted at site2, was shown to be generally successful by the high level of satisfaction with community and further large contribution of community to livability. Residents at site1 seem to be in the course of groping for a desirable community. The second way is taken up below.

Table 37 compares lifestyles with frequency of visits to the central district and the hinterland. The central district is regarded as an area to enjoy higher grade urban services. The hinterland, on the other hand, is an area to enjoy amenities which are hard to obtain in new towns. No difference is seen between S-LS1 and U-LS1. Independent of a lifestyle, residents at site1 visit the central district with the same frequency[38]. On the other hand, S-LS1 visit the central district more often than S-LS2. This probably reflects gaps in convenience 2. For the hinterland, no difference is observed between

[37] These conditions are called "closed resources". They are societal resources which neighboring people utilize or are forced to use, but other people usually do not or can not use. On the other hand, "open resources" are societal resources which anyone can use if the cost, including non-monetary, is paid. Examples are commercial and most public facilities (Ueno 2005).

[38] This may have a relation to the fact reported by Farthing et al (1996) that locally provided facilities can improve accessibility, but does not lead to more frequent use of all the facilities.

any pairs of lifestyles. It is fair to say that the condition of neither site nor lifestyle has an influence on the frequency of visiting the hinterland. This hints that the hinterland equally provides all lifestyles with amenities demanded by them.

Table 37 Comparison of the frequency of visits to the central district and the hinterland among lifestyles

	No. of cases	More than once a month	Once a month or less		Total
Central district					
S-LS1	54	0.44	0.56		100.0
U-LS1	75	0.40	0.60		100.0
S-LS1	54	0.44	0.56	**	100.0
S-LS2	172	0.22	0.78	**	100.0
Hinterland					
S-LS1	54	0.31	0.69		100.0
U-LS1	72	0.28	0.72		100.0
S-LS1	54	0.31	0.69		100.0
S-LS2	172	0.41	0.59		100.0

Note1) The central district is the destination for leisure activities including shopping.
Note2) The hinterland consists of the rest area of Nishi-ku and the northwest area in Fig3 for the S-LS1 and U-LS1, and the northwest area for the S-LS2.

Table 38 shows the frequency for those living each lifestyle to visit the central district and the hinterland. There is no difference among the two directions for S-LS1 and U-LS1. However, S-LS2 visit the hinterland more often than the central district. This is possibly because S-LS2 make more of amenity than convenience 1 as well as because site2 is inferior to site1 in convenience 2. Table 39 shows the relation between the frequency of visiting the central district and the evaluation of convenience. High frequency visitors of S-LS1 assess livability and conveniences 1 and 2 lower than low frequency visitors. This suggests the following. S-LS1 who evaluate convenience 1 low have a higher necessity to visit the central district often. That makes them have a severe evaluation of convenience 2 which lowers livability. This reconfirms that their visits are a means to compensate for the lack of urban services at the town center. The high frequency U-LS1 visitors, conversely, evaluate livability highly, but evaluate equally conveniences 1 and 2.

They are more satisfied with the three factors than the high frequency visitors of S-LS1 as shown in Table 40[39]. That is, their visits increase their use of the urban services they enjoy and then enhance their evaluation of livability. This is a difference in the effects of visits to the central district among S-LS1 and U-LS1.

Table 38 Comparison of the frequency of visits between the central district and the hinterland

		No. of cases	More than once a month	Once a month or less		Total
S-LS1	Central district	53	0.43	0.57		100.0
	Hinterland		0.30	0.70		100.0
U-LS1	Central district	72	0.39	0.61		100.0
	Hinterland		0.28	0.72		100.0
S-LS2	Central district	157	0.22	0.78	**	100.0
	Hinterland		0.38	0.62	**	100.0

Note1) The central district is the destination for leisure activities including shopping.
Note2) The McNemer test was carried out.

[39] There were no gaps in the level of satisfaction among low frequency visitors for the two lifestyles.

Table 39 Relation between the frequency of visiting the central district and convenience

	More than once a month	Once a month or less	
	S-LS1		t-value
No. of cases	24	30	
Livability	-0.07	0.38	-2.328 *
Convenience 1	0.29	0.66	-2.315 *
Convenience 2	0.51	0.90	-2.123 *
	U-LS1		t-value
No. of cases	30	45	
Livability	0.82	0.45	2.647 **
Convenience 1	0.85	0.58	1.488
Convenience 2	1.06	0.90	1.325
	S-LS2		t-value
No. of cases	38	134	
Livability	-0.17	-0.13	-0.231
Convenience 1	-0.13	-0.32	1.346
Convenience 2	-0.56	-0.54	-0.151

Table 40 Comparison of the satisfaction levels between the high frequency visitors of the two lifestyles

	S-LS1	U-LS1	t-value
No. of cases	24	30	
Livability	-0.07	0.82	-5.534 **
Convenience 1	0.29	0.85	-3.352 **
Convenience 2	0.51	1.06	-3.309 **

Table 41 Relation between the frequency of visiting the hinterland and amenity

	More than once a month	Once a month or less	
	S-LS1		t-value
No. of cases	17	37	
Livability	0.37	0.10	1.246
Amenity	-0.15	0.13	-1.051
	U-LS1		t-value
No. of cases	20	52	
Livability	0.38	0.66	-1.295
Amenity	-0.09	-0.03	-0.217
	S-LS2		t-value
No. of cases	69	98	
Livability	0.02	-0.23	1.714
Amenity	0.08	-0.02	0.724

For S-LS2, there are no differences in the three factors among high or low frequency visitors. S-LS2 have a smaller share of high frequency visitors than S-LS1, as shown in Table 36. Furthermore, they visit the hinterland more often than the central district as shown in Table 37. This suggests that visiting the central district is not so important for S-LS2 to live a happy life, despite the fact that they are far less satisfied with the conveniences than the other lifestyles. They are indeed practicing a preferred lifestyle. Table 41 exhibits the relation between the frequency of visiting the hinterland and the evaluation of amenity. There are no differences in the two factors among the high and low frequency visitors of all lifestyles. This proves they are all similarly enjoying the amenities independent of lifestyle, locality and actions, as often described.

5. Summary of results

●A back-to-the-city movement has been observed recently in Kobe, as elsewhere in large cities in Japan. However, there are some differences within the old area. The east zone has already recovered its population to the same level as just before the earthquake, and now it is attracting people from both inside as well as outside of the city. On the other hand, the west zone has not yet recovered and further has no prospect for recovery.

●This is because the east zone has had many redevelopment projects in the process of

disaster recovery and also has been primarily popular as a place of residence. It is quite convenient for commuting to Osaka City. Thus the east zone is leading the back-to-the-city movement in Kobe.

•The suburbs as a whole have been maintaining a slightly higher level of population than just before the earthquake, but there are differences locally. Relatively newly developed areas show a trend of saturation or a slight increase in population. On the other hand, older developed areas are suffering slow depopulation. The suburbs also exhibit a rapid aging of population and decrease of children compared with the average in Kobe.

•Since the earthquake, there has emerged a surplus of population flow from the suburbs to the older area. The surplus has been gradually getting smaller, but the reverse is probably not expected from now on. The suburbs are now pulling in people from the west and northwest areas of the city, and pushing people out to the east zone and the east area, resulting in a negative net inflow.

•As for the location of former places of residence, the suburbs makes up approximately 70% of the total at site1, while only 41% at site2. Seishin NT occupies 27% of the total at site1. Places of residence are competing to attract migrants within the same town as well as the suburbs.

•At site1, the share of those who prefer an urban lifestyle is 53%, which is larger than 37% of those who prefer a suburban lifestyle, and over 70% of those living each lifestyle are generally practicing their preferred lifestyles. On the other hand, at site2, the share of those who prefer a suburban lifestyle is over 70%, which is much larger than 14% of those with preferences for an urban lifestyle. Over 80% of the former are generally practicing their preferred lifestyles in contrast to 30% of the latter.

•Site1 is a place of residence for those preferring both lifestyles and demonstrates a new way of living in the suburbs, while site2 is a place for living typical suburban lifestyles as expected by town planners. Migration to site1 was induced by seeking for convenience, while that to site2 was for amenity. As a result, those migrating to both sites generally solved the problems in their former lifestyles.

•Site1 has a higher level of convenience than site2, but the reverse is true for community. U-LS1 are more satisfied with community than S-LS1, but their satisfaction level is relatively low compared to those living at site2. There is no difference in the level of amenity among sites as well as lifestyles. Amenity is produced by proper town planning.

•Convenience has a positive influence on livability for S-LS1 and U-LS1, but no influence on S-LS2. The degree of the influence is larger for S-LS1 than for U-LS1. Amenity has a positive or equal degree of influence on livability for those living the three lifestyles. In addition, no difference in the level of amenity is observed among any pairs of lifestyles. Proper town planning can improve amenity regardless of lifestyle or site. Community has a positive influence on livability for S-LS2, but not for S-LS1 or U-LS1.

•S-LS1 and U-LS1 have solved many of their problems by migrating and are generally enjoying their lives at site1. The same is true for S-LS2, but they are bothered by the inconveniences more now than they were when they migrated. More than half of S-LS1 and U-LS1 expect to live at the same place throughout their lives. However, less than half of U-LS2 feel this way. They seemingly cannot move and compromise on locality for the time being.

•S-LS2 have fostered good community. Residents are very satisfied with their community and the level of satisfaction has an influence on livability. S-LS1 and U-LS1 seem to be in the course of searching for desirable community life due to their short period of residence. That is possibly why the level of satisfaction with community has no influence on livability.

•S-LS1 and U-LS1 visit the central district with the same frequency, but S-LS1 visit the central district more often than S-LS2. This probably reflects gaps in convenience 2. On the other hand, neither site conditions nor lifestyles have an influence on frequencies of visiting the hinterland. This hints that the hinterland equally provides all lifestyles with amenities demanded by them.

•There is no difference in visiting frequency to the central district or the hinterland for S-LS1 and U-LS1. However, S-LS2 visit the hinterland more often than the central district. This is probably because S-LS2 make more of amenity than convenience 1 as well as because site2 is inferior to site1 in convenience 2.

•High frequency S-LS1 visitors assess livability and conveniences 1 and 2 lower than low frequency visitors. This suggests the following cause and effect. S-LS1 who evaluate convenience 1 low have a higher necessity to visit the central district often. That makes them have a severe evaluation of convenience 2, which lowers their evaluation of livability. This reconfirms that their visits are a means to compensate for the lack of urban services at the town center.

•High frequency visitors of U-LS1, conversely, evaluate livability higher than low frequency visitors, and they evaluate conveniences 1 and 2 similarly. This suggests the

following cause and effect. They are more satisfied with livability and conveniences 1 and 2 than S-LS1. Their visits increase the urban services they enjoy and then enhance the evaluation of livability. This is a difference in the effects of visits to the central district between S-LS1 and U-LS1.

•For S-LS2, there is no difference in the evaluation of livability and conveniences 1 and 2 between high and low frequency visitors. They have a smaller share of high frequency visitors than S-LS1 and visit the hinterland more often than the central district. This suggests that visiting the central district is not so important for S-LS2 to live a happy life.

•Concerning amenity, there is no difference in livability and amenity among high frequency visitors and low frequency visitors for all lifestyles. This proves they are all similarly enjoying their amenities independent of lifestyle, locality and actions.

•Thanks to the two ways of positioning the town center at site1, S-LS1 and U-LS1 can cohabitate, in a household as well as the housing site, and further they both can practice their preferred lifestyle. This hints at a new relation between the suburbs and the central district, and further at a sustainable city form or compact city.

•There is no evidence that the level of convenience conditions the realization of any preferred lifestyle. In contrast, high amenity is a necessary condition to realize urban lifestyles as well as suburban lifestyles. Community can not condition the realization of a preferred suburban lifestyle independent of the level of satisfaction as well as locality. Community can condition the realization of a preferred urban lifestyle.

•Convenience and amenity have an influence on livability for S-LS1 and U-LS1, but community does not. The former react more positively to the change in convenience than the latter in their evaluation of livability. On the other hand, amenity and community have an influence on S-LS2, but convenience does not. Amenity has a positive or equal degree of influence on livability independent of lifestyle and locality.

6. Conclusion

This paper investigated how well people have been able to live their preferred lifestyles at two types of residential sites and then tried to make suggestions of a sustainable city form in a depopulated society. It is fair to say that the aim was generally achieved. Especially, a preferred lifestyle was proved to be an effective means for analysis and consideration. Results shown above were from an analysis of a local case study. However, they indeed give some interesting implications, which might

be useful for considering measures to cope with unprecedented situations occurring in urban areas all over Japan. Some concluding comments may be drawn from the results.

6.1 Characterization of sites and lifestyles

Site1 is generally livable for those preferring suburban and urban lifestyles and can be regarded as a new type of resident location. Furthermore, there is no difference in the main attributes among those preferring both lifestyles. This success so far depends on the two factors. One is the town center, which the different lifestyles can position in different ways as they like. The other is the subway, which effectively connects the suburbs with the central district. This site is a successful example of a desirable relation between suburbs and city centers, or a sustainable city form in a depopulated society. On the other hand, site2 is far more livable for those preferring suburban lifestyles than urban lifestyles, but it has some problems in convenience. It can be regarded as a traditional housing community in the suburbs. The community at site2 has been fostered over a long period of time, while the community at site1 has not yet had sufficient time to do so. It is a very interesting theme to consider the possibilities for how community will be fostered in site1 and then how the evaluation will change.

Residents who preferred urban lifestyles were more satisfied with convenience, especially convenience 2, and community than those living suburban lifestyles at site1. No difference was found among them for amenity. Convenience and amenity had an influence on the evaluation of livability for the both lifestyles. Convenience had a larger influence for those preferring suburban lifestyles than urban lifestyles, but amenity had the same amount of influence for both. The attitude toward community seems different between the two. The former possibly liked a relatively close community and the latter a somewhat distant community. Residents living suburban lifestyles at site1 were far more satisfied with convenience but far less with community than those living suburban lifestyles at site2. No difference in amenity was found between them. Convenience and amenity have an influence on the evaluation of livability for the former, while amenity and community did so for the latter. Amenity had the same amount of influence on the evaluation of livability for those preferring both lifestyles. With some difference in frequency, residents of all lifestyles visited the central district and the hinterland in order to compensate for the lack of urban services or amenities in their neighborhoods. High amenity was a necessary condition for satisfactory realization of urban and suburban lifestyles. The level of community supported the satisfactory realization of urban lifestyles, but not of suburban lifestyles.

No evidence was found for convenience conditioning the satisfactory realization of any lifestyle.

Thus, the urban and suburban lifestyles of residents at site1 are new types in the suburbs, because they both seek for convenience as well as amenity in the residential site, although the former makes more of convenience 1 and the latter of convenience 2. Furthermore, the suburban lifestyles at site2 are as expected through traditional town planning. People are living there by balancing convenience, amenity and community. The balance is, for the time being, expected to shift toward convenience. It is indispensable to attract new types of residents for activating the stagnant suburbs.

6.2 Suggestions for a sustainable city form

If those who make much of convenience increase, more people will concentrate in areas such as site1 in the suburbs as well as in city centers. All housing sites now compete against other sites not only in city centers but also within suburbs or the same new town. If suburbs continue to stagnate as they are now, not only will the overhead capital invested in suburbs over a long period be useless, but suburbs might become the scene for a generation of ghost towns, especially in areas unattractive to the younger generation (Miwa 1996). Suburbs are now standing at the beginning of a new phase of urban development in Japan and are asked to establish a sustainable form which depends much on good relationships with older areas (Newman et al 1999).

In this situation, site2 is expected to be a new form of residential location and an effective means to save stagnant suburbs[40]. A back-to-the-city movement may provide convenient conditions to suppress urban sprawl and form compact city (Yoshiyama 2002). This view holds true for the suburbs in Kobe, where people concentrate in limited areas nearby railway stations. Towns inclusive of such a convenient place are what we call "compact town". This is different from the ordinary concept in that the town must be sustainable not under the pressure of sprawling but under the reduction of urban areas. Therefore, all the more the towns need people with different lifestyles to cohabitate. The towns must have centers which offer functions of self-sufficiency in urban services for daily life while providing residents with convenient means of transportation to city centers.

Compact town has to solve the question of how it will contain land use for housing to a compact space while enabling residents to practice their preferred

[40] Due to the earthquake followed by the financial difficulties of Kobe City, the flat came to be built at site1, which used to be a reserved land for future's business or commercial demand, unintentionally resulting in meeting the fundamental conditions of compact city or a combination of higher densities and mixed land uses (Masnavi 2000).

lifestyles. In the countryside of southern England, for example, strict regulations for land use have succeeded in containing residential areas to compact spaces, but have not always succeeded in containing residents' regular travel, especially long distant commuting (Headicar 2000)[41]. Most people use cars for commuting, because the towns do not provide enough jobs within them or in their neighboring areas, nor convenient railway services. The countryside is now facing the issue of inefficient energy consumption. Fortunately, Seishin NT has an industrial park nearby and has a subway linking it to the central district. The town center and its neighboring areas might be called a "compact town in the suburbs".

What is needed to form compact town in the suburbs? The following measures and also issues can be drawn from the findings so far. Convenience consists of conveniences 1 and 2. This division is useful in considering town planning for compact town. Convenience 1 is a necessary condition for a town to be compact and, to some extent, needs to be provided for by planning at the beginning stage, but is later conditioned by market mechanisms. The suburbs and the old area are competing with conveniences. As far as population movement is concerned, the suburbs are inferior in the competition as a whole. It is a very important issue to maintain relatively high levels of convenience.

On the other hand, convenience 2 is a necessary condition for residents to practice their preferred lifestyles as they like and is provided by planning mainly based on public investment. This condition is crucial for the continuance of compact town in suburbs. Residents with different lifestyle preferences have to visit elsewhere to compensate for the lack of their needs in the town[42]. However, it is controversial to make new public investments in the suburbs under a back-to-the-city movement and local governments' financial difficulties[43]. A larger viewpoint considering environmental and welfare policies[44] is required to support such an argument.

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[41] There are so many various responses to, for example, the Barker Review of Land Use Planning (http://www.hm-treasury.gov.uk/media/4EB/AF/barker_finalreport051206.pdf), because of the soaring increase in housing prices (http://www.hm-treasury.gov.uk/independent_reviews/barker_review_land_use_planning/barkerreview_land_use_planning_responses.cfm).

[42] A survey on the sphere of leisure activities shows the larger the sphere is, the more satisfied people are with their leisure lives (Ueno 2004)

[43] The services of nonstop buses to the central district have been recently introduced by private companies in towns in the suburbs which have no convenient means of transportation.

[44] People aged 70 and over, with an annual income under 3,780,000 yen, are given a free pass available for use on municipal transportation services in Kobe. If their incomes exceed the limit, they can buy the same pass for 30,000 yen. This also induces them to live at a convenient place for the public transportation services. Not shown in this paper, users of the pass have expanded their living sphere and increased their frequency of going out.

Convenience has increased importance in living environment at site2, despite the fact that few were interested in it when they migrated. This is possibly because a preference for convenience is changeable due to a rise in expectations or an increase in physical and mental handicaps with aging. It is a pity for people to have to live a different lifestyle than their preferred one, beyond their efforts to improve the living environment. Housing markets must be prepared in a hurry as people migrate as they please according to their life cycle[45]. One positive result is having obtained hints of the changes in housing requirements.

Although these two sites are within a ten minutes' drive of each other, there are clear differences in residents' levels of satisfaction with convenience. This provides us with a hypothesis that residents are very sensitive to convenience of means of transportation, because they depend much on public transportation for visiting elsewhere, especially the central district. Sustainable urban forms often force people to change their modes of travel from cars to public transportation. That might induce people to make more of accessibility to such services. This requires much attention to a combination of transportation services within towns, to the town centers, and out of the towns. Furthermore, it is important to provide residents in the hinterland with convenient means of transportation to the town center, because the prosperity of town centers depends on their demands (Reneland 2000).

As for amenities, there were no differences among lifestyles not only in the level of satisfaction but in the degree of contribution to enhancement of livability. Thus, amenities were shown to be a crucial factor for bettering living environment, and also to be easily produced by proper town planning in suburbs. Since they are ultimately a competitive power against the old area, any housing development which lessens amenities should be avoided. Finally, community needs to be fostered for a long period[46]. Preference for community varies greatly among residents, but town planning can support fostering it indirectly by providing facilities (Smith et al 1997).

6.3 Questions remain

This survey was carried out on a small number of cases in a local suburb. The analysis could not be fully carried out, so though then findings are interesting, they are

[45] There are seven phases in our life cycle; pre-marriage, marriage, pre-child, child-rearing, child-launching, post-child and widowhood (Abu-Lughod et at 1960). Not a few residents in older suburbs are facing those sixth and seventh phases at last and have begun to reconsider the design of their lives. This movement is probably behind the disturbance.

[46] Masnavi (2000) positioned the quality of social interactions with neighbors and the privacy of dwellings as issues in need of clarification through further research of compact cities.

hypothetical. Large-scale and long-term investigations in the same suburbs as well as those in others suburbs are required to clarify such findings. There remain some questions to be answered, such as:

●Does it hold for other countries that there are many people who seek for convenience even in suburbs, and are they very sensitive to gaps in the level of convenience among areas?

●Why does community have no influence on livability for S-LS1 while it does for S-LS2, despite the levels of satisfaction for each being low?

●Convenience, amenity and community surely have an influence on livability, but they explain only half of livability at most. What other factors influence livability?

●Why do S-LS1 make more of convenience in their evaluation of livability than U-LS1 do, despite their levels of satisfaction being inverse?

●Why is there no evidence that the level of satisfaction with convenience conditions the realization of any lifestyle?

●At site1, does the satisfaction level "neither" for community possibly include the meaning of "no idea" due to a short period of residence?

●S-LS1 who are less satisfied with convenience 1 have a higher necessity to visit the central district often. Does that make them have a more severe evaluation of convenience 2 and then lower their livability evaluation?

●U-LS1 are more satisfied with livability and conveniences 1 and 2 than S-LS1. Their visits to the central district can increase the urban services they enjoy and consequently they directly enhance livability. Is this situation true elsewhere?

●The period of residence at Site1 was very short. As it gets longer, how will residents' evaluation of their living environment and their reactions to it change?

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