

Basic Study on the Residential Use in the Central Area of Tokyo

By

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In recent years, drastic decrease of residential use has been more and more serious in the central area of Tokyo. But there are few studies on the entire conditions of residential use on a neighbourhood scale in relation to the effect of zoning, and there are few historical evaluations on this problem. So, in this article, we will clarify the transition of this problem for the last decade in the beginning. After that, the entire conditions of residential use at a typical neighbourhood will be analysed, and we will discuss some points to get the way of developing or conserving residential use in this area.

1. Introduction

In recent years, drastic decrease of residential use has been more and more serious in the central area of Tokyo. But from the historical point of view, there are some periods that characterise conditions and discussions of the problem. From the long-term point of view, we can recognize sustained decrease in population in the central area, but in this paper, only short-term aspects of this problem will be treated because the problem for the last decade is unique and controversial.

From the short-term point of view, we can recognize four characterised periods of this problem. Firstly, the recognition of this problem started from the research by the National Land Agency in 1981 under the Third National Comprehensive Development Plan. In this plan, 'regional settlement vision' was one of the key elements of the policy, and it was proposed that each prefecture should make a model plan. In the case of Tokyo, six wards in the central area was designated. In this period, interests on the problem was general and main point of researches was analysing the mechanism of decrease in population. Secondly, under depressive economic situation, urban policy was changed from restrictive one to stimulative one. In such circumstances, many deregulative policies were launched. Thirdly, after drastic rise of land price, it became urgent for the wards in the central area to tackle on the population loss. In this period, policies were characterised as 'emergency measures of obtaining population', and it was the most important matter to stimulate housing supply. It must be pointed out that sharp rise of land price has changed the degree of the problem drastically. But fourthly, the recognition that planning and housing system must be changed throughly to deal with

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the recent problems has been stronger.

Typical studies and articles on this problem are published by the Ministry of Construction and Tokyo Metropolitan Government (1984), Hibata (1989) and Okata (1989). The second and third articles both clarified that the effectiveness of exclusive residential zone is important to protect residential use, and Hibata pointed out that the function of realizing broad public welfare, for example supplying affordable housing, is limited in Japanese zoning system because of the weakness of local government. From this reason, it seems to be better to seek measures of obtaining residential use itself before combining the aspect of affordability or quality of residences. In addition, considering that there are few studies on the entire conditions of residential use on a neighbourhood scale, it would also be better to clarify the whole conditions of existing residential use at a typical neighbourhood and to clarify the relationship between land use regulation and actual land use.

Based on the review above, the purposes of this study are set as follows; 1) to clarify existing pattern of residential use in relation to land use control, especially that of exclusive residential zone, and other factors. 2) to clarify the entire residential use at the typical neighbourhood.

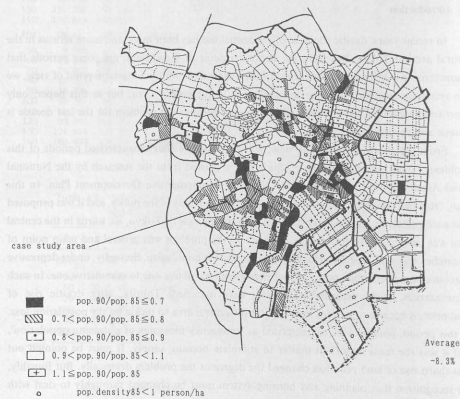


Fig. 1. Population Change in the Central Area of Tokyo (1985-90).

2. The Pattern of Population Change in the Central Area of Tokyo

Figure 1 shows population change from 1985 to 1990 in the central area of Tokyo. From this figure, the followings can be pointed out:

1) the neighbourhoods that has lost over 30% of their population during 5 years exist mainly around the non-residential areas (below 1 person/ha) such as Marunouchi and Imperial Palace; for example, Kanda, Kayabacho, Hatchobori, Shinjuku.

2) the neighbourhoods that has lost over 20% of their population during 5 years exist in south of Kanda River and in west of Sumida River. At the southwest part, Roppongi, Akasaka and Aoyama areas belong to this rank. As shown in Fig. 1, case study area is located

Table 1. Population Change in Each Zone (1985-90).

zone	name of ward	area ha	pop. 1985	pop. 1990	pop. den. /ha	pop. 90/85 (%)	pop. 90-85	labor 1986	lab/pop. 90 ratio
exclusive residential zone	Minato	748	92504	79681	107	-13.9	-12823	129505	1.40
	Shinjuku	771	143903	135738	176	-5.7	-8170	82921	0.58
	Bunkyo	688	107074	100668	146	-6.0	-6406	62355	0.58
	Taito	136	6196	5772	42	-6.8	-424	5639	0.91
	<total>	2243	949682	921859	137	-8.0	-27623	280420	0.80
residential zone	Chiyoda	440	16317	14395	34	-8.5	-1382	8611	5.32
	Chuo	138	10920	11288	82	+3.4	+368	8628	0.79
	Minato	339	33669	27983	82	-16.9	-5706	103207	3.16
	Shinjuku	547	107773	98193	180	-10.5	-11560	103207	0.99
	Bunkyo	239	49078	44663	195	-4.9	-2415	41874	0.85
Taito	77	18564	17704	230	-4.6	-860	11190	0.60	
<total>	1780	238321	216746	122	-9.1	-21575	363167	1.52	
commercial zone	Chiyoda	718	40982	33094	46	-18.2	-7886	77308	18.87
	Chuo	722	61162	50415	70	-11.6	-10746	68598	11.22
	Minato	433	39459	30811	69	-23.2	-9148	402487	10.20
	Shinjuku	332	41289	66761	102	+18.2	+7522	308915	7.42
	Bunkyo	177	27954	24688	139	-11.7	-3266	62011	2.22
Taito	718	152816	141741	185	-7.2	-11076	253665	1.66	
<total>	3161	388856	314013	99	-13.7	-49643	2483784	6.83	
industrial zone	Chuo	143	18284	16499	115	+1.3	+205	11209	0.89
	Minato	484	31503	28891	80	-8.4	-2612	101701	3.23
	Shinjuku	164	32418	27745	180	-8.9	-4733	23234	1.08
	Bunkyo	40	8353	7793	195	-6.7	-560	11551	1.38
	Taito	4	809	883	221	+9.1	+74	537	0.66
<total>	825	87467	81811	99	-6.5	-5656	157832	1.80	
total	Chiyoda	1156	17299	48031	42	-16.2	-3266	86019	15.01
	Chuo	1009	85376	78203	78	-11.5	-10173	705895	7.99
	Minato	2009	197165	166946	83	-15.3	-30219	740020	3.75
	Shinjuku	1804	325442	295497	164	-9.2	-30005	550467	1.63
	Bunkyo	1144	192459	179812	157	-6.6	-12647	177791	0.92
Taito	895	173285	166100	187	-6.9	-12285	211091	1.52	
<total>	8108	1093126	934529	115	-10.1	-104597	3285203	3.16	

Table 2. Outline of the Case Study Area.

	Akasaka 6	Akasaka 9	Roppongi 2	Roppongi 4	total
area	18.27ha	17.73ha	7.47ha	9.46ha	52.93ha
road area (ratio)	2.56ha (14.12%)	1.52ha (10.83%)	1.23ha (16.47%)	2.20ha (24.31%)	5.51ha (15.17%)
number of lots m ² /lot	391 401	152 1040	86 725	175 409	804 558
pop. 1985	2471	1241	477	1209	5398
pop. 1990	1995	929	369	1013	4306
pop. 90/pop. 85	-19.3%	-25.1%	-22.6%	-16.2%	-20.2%
household 1985	1284	792	224	490	2790
household 1990	1043	651	175	421	2290
house. 90/'85	-18.8%	-17.8%	-21.9%	-14.1%	-17.9%

just in this part.

3) the neighbourhoods that has lost under 10% of their population during 5 years are found in the northern part of Shinjuku-ku, whole Bunkyo-ku, in the northern and eastern part of Taito-ku and east side of Sumida Rver. In the former Fukagawa-ku, there are some neighbourhoods that has got over 10% of their population during 5 years.

Table 1 shows the relationship between population change from 1985 to 1990 and zoning. From this table, the followings can be pointed out;

1) total population changes in each zone are; commercial zone (-13.7%), residential zone (-9.1%), and exclusive residential zone (-8.0%) respectively.

2) population changes in each zone of each ward are; Minato-ku[commercial](-23.2%)> Chiyoda-ku[commercial](-19.2%)> Shinjuku-ku[commercial](-18.2%)> Chuo-ku[commercial](-17.6%)> Minato-ku[residential](-16.9%)> Minato-ku[exclusive residential](-13.9%)> Bunkyo-ku[residential](-11.7%)> Shinjuku-ku[residential](-10.5%). That's all that have higher decrease than the average. It is obvious that in Minato-ku, even in exclusive residential zone, the speed of population decrease is more rapid than in other wards.

3. Case Study

3.1 Method and Subject of the Case Study

Based on the previous analysis, Akasaka-Roppongi area (Akasaka 6-home and 9-home, Roppongi 2-home and 4-home. 53ha.) in Minato-ku was adopted as the typical neighbourhood in the central area; recorded rapid population decrease, surrounded by main roads, composed of category II exclusive residential zone, residential zone and commercial zone.

Field survey was carried out in August 1990. In this survey, 'Change' was defined by the difference between the contents of map of five years ago and actual conditions in the field survey. Items of the research were structure, stories, housing type and use of each floor of

each building. If the building was collective one, the number of total units and each use of the unit were also recorded. General physical conditions were recorded from 1:2,500 map lot by lot.

In addition, it must be noted that in the category II exclusive residential zone non-residential use upper third floor or over 1,500 m² is restricted by the Building Standard Law. But as this regulation came into force in 1976, buildings built before that aren't regulated by this provision. Besides, as the location of case study area is very well, it is suspected that non-conforming use is prevalent.

3.2 Outline of the Case Study Area

Table 2 shows the outline of the case study area and Fig. 3 shows renewal pattern of this area from 1985 to 1990. The followings can be pointed out;

1) renewal speed is highest in Akasaka 6-home which is closest to the CBD, especially at residential zone and commercial zone; closed buildings, reconstructions and pieces of vacant lands are often found.

2) but the ratio of population decrease in recent 5 years is highest at Akasaka 9-home (-25.1%) where renewal speed is lower, and Roppongi 2-home (-22.6%), Akasaka 6-home (-19.3%) and Roppongi 4-home (-16.2%) are succeeding to it (Table 2). From these results, it could be pointed out that renewal speed and population loss aren't always related. The highest population loss in lower renewal speed is caused by rapid transition from residential use to business use in the apartments.

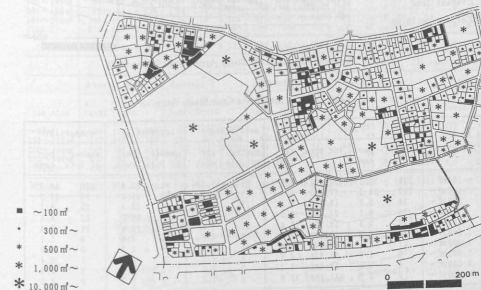


Fig. 2. Lot Size in the Case Study Area.

3.3 The Character of Lot

Figure 2 and Table 3 show the lot size in the case study area. Figure 4 shows number of lots in each zone according to lot size and width of the front street. The followings can be pointed out;

1) remarkable character is that the share of large lot in area is high; 5 lots over 10,000 m² have 35.9% of all lots in area, 67 lots over 1,000 m² have 67.2% in area.

2) meanwhile, under 100 m² lots have 37.3% (300/804) of all lots in number but have only 4.5% in area.

3) approximately, lot size is larger in exclusive residential zone, residential zone is

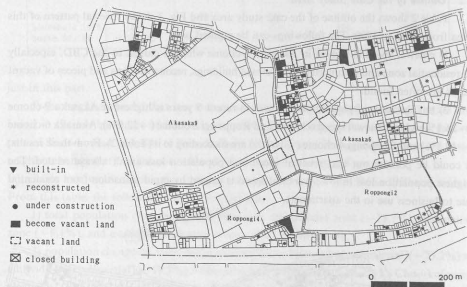


Fig. 3. Renewal Pattern of the Study Area from 1985 to 1990.

Table 3. Lot Size in the Case Study Area.

lot size	Total				excl. resid.		residential		commercial	
	number of lots	per cent	lot area	per cent	number of lots	per cent	number of lots	per cent	number of lots	per cent
~100 m ²	300	37.3%	20,210	4.5%	85	35.0%	95	32.8%	120	44.3%
100 m ² ~	209	26.0	27,700	6.2	57	22.5	73	25.2	19	22.2
200 m ² ~	78	9.7	16,630	4.1	17	7.0	38	12.4	25	9.2
300 m ² ~	73	9.1	27,440	6.1	20	8.2	31	10.7	22	8.1
500 m ² ~	77	9.6	58,130	11.8	24	9.9	33	11.4	20	7.4
1,000 m ² ~	34	4.2	48,790	10.2	17	7.0	14	4.8	3	1.1
2,000 m ² ~	17	2.1	39,440	8.8	15	6.2	2	0.7	1	0.4
3,000 m ² ~	6	0.7	20,930	4.7	3	1.2	2	0.7	0	0.0
5,000 m ² ~	5	0.6	34,580	7.7	2	0.8	2	0.7	1	0.4
10,000 m ² ~	5	0.6	181,100	35.9	3	1.2	2	0.7	0	0.0
total	804	100.0	448,950	100.0	243	100.0	290	100.0	271	100.0

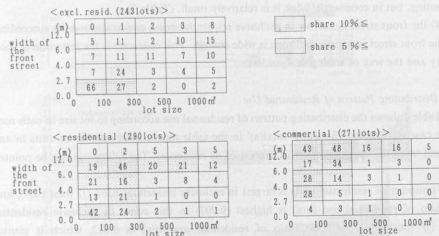
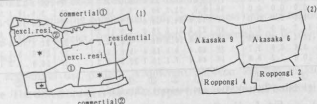


Fig. 4. Number of Lots in Each Zone According to Lot Size and Width of the Front Street.

Table 4. The Distributing Pattern of Residential Use According to Lot Size.

lot size	(1) each zone											
	excl. resid. ①			excl. resid. ②			residential			commercial ④		
	a.	b.	b/a	a.	b.	b/a	a.	b.	b/a	a.	b.	b/a
~99 m ²	34	34	1.000	83	83	1.000	110	93	0.845	15	7	0.568
100~299 m ²	96	89	0.927	54	26	0.467	321	219	0.679	133	32	0.237
300~499 m ²	63	44	0.698	49	39	0.796	155	82	0.529	262	64	0.244
500~999 m ²	240	155	0.646	78	50	0.658	210	139	0.668	193	29	0.158
1000 m ² ~	810	357	0.440	301	139	0.462	83	65	0.783	32	32	1.000
Total	1243	879	0.707	558	347	0.622	979	595	0.608	625	164	0.262
	(2) each block											
	Akasaka 6			Akasaka 9			Roppongi 2			Roppongi 4		
lot size	a.	b.	b/a	a.	b.	b/a	a.	b.	b/a	a.	b.	b/a
~99 m ²	300	113	0.376	95	80	0.837	79	54	0.684	63	37	0.587
100~299 m ²	432	297	0.685	158	63	0.399	48	28	0.583	112	43	0.384
300~499 m ²	240	187	0.783	174	52	0.297	54	13	0.261	51	9	0.187
500~999 m ²	348	242	0.695	219	79	0.361	82	5	0.061	43	33	0.767
1000 m ² ~	490	301	0.614	339	171	0.514	0	0	0	540	249	1.000
Total	1880	1110	0.590	979	484	0.494	283	100	0.360	869	470	0.581



succeeding, but in commercial zone it is relatively small. (Table 3)

4) the front street is narrow in exclusive residential zone, residential zone is succeeding, but the front street in commercial zone is wide enough. This character is the reflection of local history and the way of zoning designation.

3.4 Distributing Pattern of Residential Use

Table 4 shows the distributing pattern of residential use according to lot size in each zone in the case study area. The word 'total(a)' in the table means total number of units in any use, and 'resid.(b)' means number of units used as residences. The followings can be pointed out;

1) number of residential units is largest in exclusive residential zone ① (east part), and the ratio of residential use (b/a) is highest (0.707) in this zone. In exclusive residential zone ② (northwest part) the ratio of residential use (b/a) is 0.622, which is similar to 0.608 in residential zone. The ratio of residential use in commercial area is only 0.262 (in commercial zone ①: north part), 0.340 (in commercial zone ②: south part), where total units of residential use is small.

2) in exclusive residential zone and residential zone, the ratio of residential use (b/a) in lots under 100 m² is very high because many old detached-houses remain in these zones. (cf. Fig. 2)

3) the ratio of residential use in each chome could be explained by the combination of each character described 1) and 2).

3.5 Stories and Residential Use

Figure 5 shows the composition of actual use in each floor in the case study area, and Fig. 6 shows the same thing according to the stories. From these figures, the followings can be pointed out;

1) land use intensity is higher in commercial area than in residential and exclusive residential area. In exclusive residential area 7-stories is the highest building, which is the reflection of low designated floor area ratio (300%) and narrow front street.

		residential				commercial			
		10F	8F	6F	4F	10F	8F	6F	4F
	exclusive residential	0.0	100.0	0.0	0.0	0.0	66.0	20.0	20.0
1F		0.0	65.7	0.0	0.0	33.3	45.0	31.8	22.7
2F		0.0	71.4	14.3	0.0	14.3	7.1	31.0	45.2
3F		0.0	55.5	25.0	0.0	1.7	10.3	22.4	50.0
4F		0.0	52.2	50.4	4.3	12.0	9.6	18.1	50.6
5F		33.1	40.6	6.3	0.0	0.0	12.8	16.5	45.0
6F		55.1	28.6	12.2	0.0	6.1	17.0	13.0	42.5
7F		52.8	21.7	18.4	1.9	6.6	22.2	10.5	35.1
8F		78.8	7.8	8.9	0.9	1.7	27.9	5.7	31.1
9F		87.7	10.6	10.6	2.2	3.8	16.6	3.2	18.9
10F									

① Residential only, ② Residential and business, ③ Business only, ④ Commercial only, ⑤ Others

Fig. 5. Use Composition in Each Floor (number: %).

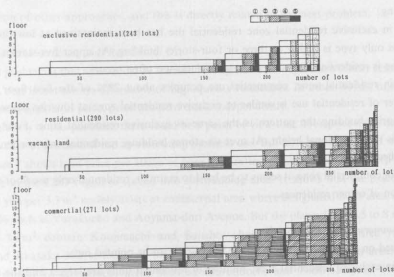


Fig. 6. Use Composition in Each Floor According to the Stories.

2) the ratio of residential use only is highest at the second floor in every zone. The upper the floor is, the higher the ratio of residential and business use. Business only is highest at middle story, commercial only is highest at the first floor and the ratio gets decreased at upper story except for commercial zone.

3) in exclusive residential zone, the ratio of residential use only is high, especially at two-stories building, where almost all use is residential only. At three or four-stories building, the ratio of business only is high at each floor, but at over five-stories building, basic use is residential even though the mixture of residential and business use occupies high proportion.

4) in residential zone, at lower than four-stories building, basic use is residential even though commercial use at the first floor and business use at each floor is little higher than in exclusive residential zone. But at over five-stories building, basic use changes to business and residential use becomes minor.

5) in commercial zone, especially at higher than three-stories building, the first floor is mainly occupied by business and commercial use. And it is different that commercial use occupies in general at upper floor. Residential use only is relatively high at the upper floor, but at upper six-stories building commercial only and business only are major use.

Considering these character, important points for conserving or developing residential use are as follows;

1) existing residential use pattern is different between low-rise building and upper three-stories one. The difference gets larger at upper five or six-stories building. This character seems to be mainly caused by site conditions in a broad sense, not only by building regulation

of zoning.

2) in exclusive residential zone residential use has been maintained at low-rise house, business only type is higher at three or four-stories building. At upper five-stories building basic use is residential and conversion to business use often occurs.

3) in residential zone, commercial use occupies about 20% of the first floor but the character of residential use is similar to exclusive residential zone at low-rise house. At the three-stories building the pattern is the same as exclusive residential zone. Four or five-stories is the transitional height. At over six-stories building, residential only use tends to be diminished.

4) in commercial zone, it seems to be hard to maintain residential only use floor with the exception of owner residences.

3.6 Summary of the Case Study

Based on the previous findings, the followings can be pointed out:

1) in exclusive residential zone, number of residential units are largest and the ratio of residential use is higher than other zones. But there are some problems to be treated; (1) the greater part of non-residential use (0.319 = 575 units) must have been changed from residential use in recent years especially at Akasaka 9-chome area (exclusive residential zone ㉔). Therefore, preventive measures for transition of residential use seems to be the most important matter. (2) existing low-rise houses would be renewed in the near future, therefore how to treat these renewal should be another important matter. On that time, treatment for over 500 m² (or 1,000 m²) lots will be critical for this neighbourhood because of its large share. (cf. Table 3)

2) in residential zone renewal speed is higher especially at Akasaka 6-chome, but the ratio of residential use is only little lower than that of exclusive residential zone. In spite of this, there is no guarantee that residential use will be conserved in the near future. This fear can be emphasized by existing use pattern at over five-stories building in this zone. (cf. Fig. 6)

3) there are many small lots under 100 m² where the ratio of residential use is extremely high, but there is also no guarantee that residential use will be conserved from now on.

4. Discussion

4.1 Conservation and Development of Residential Use

The first problem is that what could be done through land use regulation is only the conservation of existing residential use, not development or improvement of it. From this reason, even if use is restricted only to residential use, residential use shouldn't be developed when a developer doesn't want to develop it on the ground that residential use doesn't pay economically. As a result, unrealised vacant space would be prevalent or nominal residential use would appear.

Therefore, how to develop or realise residential use should be treated through the

combination of other approaches, and this is directly related to the next problem.

4.2 Land Price Problem and Residential Use

Next problem is that what could be realised through land use regulation is only residential use itself, that is not always affordable or high quality residences. In other words, under the conditions of high land price, price problem exists independently.

In relation to this problem, there could be a point of view that floor price must decrease as low as that of residential use by restricting business use. But how much degree is it true?

Figure 7 shows land price per 100% of floor area ratio at April 1986 when sharp rise of land price in the CBD began to spread into surrounding area. It shows that the places over 8 million yen per 3.3 m² mainly exists at commercial area where designated floor area ratio is 700-900% such as Yurakucho and Aoyama-dori Avenue. But the places from 4.5 to 8 million yen per 3.3 m² contain Koujimachi and Bancho where designated floor area ratio is 400% and Akasaka 300%; these are high class residential areas in the central area, which price is similar to commercial areas such as Marunouchi and Nishi-Shinjuku (1000%), Kanda-Yasukunidori Avenue (700-800%). The places from 2.5 to 4 million yen per 3.3 m² contain Azabu and Shirokane, which is similar to the places along main roads in Bunkyo-ku (600%) and Yamate-dori Avenue (500%). The difference between residential area and

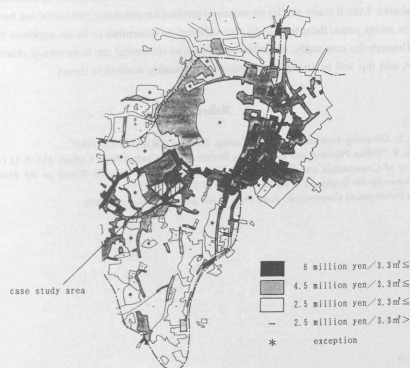


Fig. 7. Land Price Per 100% of Floor Area Ratio in April 1986.

commercial area seems to have only the second meaning for land price. According to these facts, it is suspicious that land price would go down by restricting business use in residential zone.

4.3 *How to Protect Use Conversion from Residential to Business*

The third problem is whether protection of use conversion from residential to business is possible or not. As mentioned above, even in exclusive residential zone there are many non-residential use and many use transition from residential to business.

However, by observing the phenomenon one by one, non-residential ratio in each apartment differs very much; one apartment is well maintained as residences and transitions to business use never happen, while another apartment had been supplied for business use from the beginning. According to these facts, it seems that intentional non-conforming use must be regulated and punished by police power but others should be treated by another way such as common management rule.

4.4 *Development of Normative Theory for Habitation in the Central Area*

The last problem is meaningful one. As mentioned in Chapter 1, the recognition that planning and housing system must be changed drastically has been more and more stronger. To meet this expectations, it is necessary to discuss normative theory for habitation in the central area. Even if many studies on technical method for obtaining residential use have been done in recent years, these tend to be too technical or sometimes to be an armchair theory.

Through the case study, the entire conditions of residential use have turned clearer than before, and this will be an important basis for discussing normative theory.

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