

## STUDY ON THE BUILDING CONVERSION FOR TEMPORARY USE BY PUBLIC SECTOR



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### Summary

In Japan, we have some conversion projects recently, but not so many. On the other hand, there are lots of empty buildings left especially in local cities. Most of those buildings are functionally obsolete but still physically useable. We examined the effectiveness conversion for temporary use as an alternative way of “scrap and build” type redevelopments and the technique to prolong the building lifetime by case study.

Conversion for temporary use is effective corresponding with the demand for new public service. Not physical strength of the buildings but urban planning decides the period of use.

**Keywords:** Conversion, public sector, temporary use, redevelopment plan

### 1 Introduction

This paper describes the possibility of building conversion for temporary use as an alternative to “scrap and build” type redevelopments.

#### Why conversion?

We have enough buildings in Japan, construction market in shifting from scarp and build into reuse existing building stock in these days.

On the other hand, local economy has been depressed and there are lots of empty buildings left especially in local cities. Those buildings are functionally obsolete but still physically useable. The more they have vacant buildings, the more their local economy depressed.

Building conversion will solve these two problems, lots of vacant buildings and local economy depression. Because, conversion can takes the balance between demand and supply in its surrounding area using existing building.

### **Why public sector?**

In these days, most of local authorities has financial problem, therefore they pay attention to reuse the existing stock that helps saving fund. Moreover, public sector should prepare the conditions that attract investment of private sector into its local city for reactivation.

On these circumstances, public sector is needed to play a leading role for the promotion of reuse the existing building stock.

### **Why temporary use?**

Building conversion is still rare and we have no effective policy that promotes conversion in Japan. Therefore conversion is thought as a high-risk project.

The life expectancy of Japanese building is shorter than European countries. Therefore the technology to prolong it by conversion is more practical even if it is just five or ten years. Moreover, to set the limit of use, we will be able to invest more efficient and the project risk will be less.

Temporary use is effective way as a first step for promoting conversion in Japan.

## **2 Research subject**

The definition of “temporary use” in this paper is as follows: utilization period has been decided and rental use.

The subjects of this paper are large department store, public schools and PFI (Private Finance Initiative) conversion projects. We took interviews with the persons in charge and investigated documents of the projects, from August 2006 to Spring 2007. We focused especially on the background, new use and management of those projects.

Social changes often cause conversion activity. We focused on “public schools” and “large department store” as typical example of such activity. In these case studies, we compared not only temporary use but also “normal” conversions, which its utilization period has not been decided. As for the large department store, the number of withdrew shop tenant is increasing because of economical depression especially in local cities. As for the public schools, the number of closed school is increasing because of declining birthrate.

We focused on PFI conversion projects as well. Their period of is decided on the contract between public and private sector, which means PFI is good example of conversions for temporary use.

## **3 Case studies**

### **3.1 Large department store**

On the basis the result of questionnaire to all local cities in Japan, we selected the conversion projects from large department stores that their floor area is over 1000 m<sup>2</sup> [1]. **Tab. 1** is the list of subject projects that we could get enough information for analysis.

#### **3.1.1 General conversion process**

When the core tenant decides to withdraw from the large department store, it announces to local government the schedule. Local government and the residents of the city ask to the tenant to continue to exist, and at the same time they start to discuss how to reuse the

building. However, core tenant withdrawn around one year after the announcement. After that, as soon as possible, local government converts the large department store to public facilities. All this process takes around two years. Local government deals with this problem as soon as possible for keeping the area center of local economy.

**Tab. 1** Conversion projects from large department stores

Case	1-A*2	1-B*2	1-C*2	1-D*2	1-E
City	Nagaoka	Jouetsu	Tsu	Yamagata	Nagano
Total floor area (m <sup>2</sup> )	8,129	10,160	25,307	20,441	23,941
Structure <sup>†</sup> / Stories	RC / 7 floors, 1 basement	RC / 3 floors	SRC / 9 floors, 1 basement	SRC / 8 floors, 2 basement	SRC, RC / 9 floors, 1 basement
Conversion construction	1 basement to 5 floors	All	2nd and 3rd floors	Upper 5 floors	1 basement to 4 floors
Vacant Floor	Upper 2 floors	No	No	No	Upper 5 floors
Building Owner (ex-owner)	Private company (same)	Local government (Private company)	Private company (same)	Private company (Another Private company)	Local government (Private company)
Conversion year / Completion year	2001 / 1963	2001 / 1985	2001 / 1985	2003 / 1976	2003 / 1976
New use	Welfare, Civic center, Cultural facilities, Public Office	Welfare, Civic center, Shop, Public Office	Cultural facilities, Public Office	Welfare center, Cultural facilities, Shop, Office	Welfare, Civic center, Shop, Public Office
Developer	Local government	Local government, Private company	Local government	Chamber of commerce and industry	Local government, TMO*3
Conversion cost (1,000 yen per sq.m)	37.3	107.3	Unknown	Unknown	50.0
Subsidy	No	No	No	National Government	National Government
Seismic reinforcement	Yes (Before conversion)	No	No	No	Yes
Period of temporary use	5 years rental first time, then extended 5 more years (rental)	20 years (PFI contract)	Local government rents tow floors, from 2001 to 2007	Chamber of commerce and industry rent upper four floors	As long as possible
Note	The private company rent the building to local government.	The private company donated the building to local government.	-	Private real estate company bought the building.	The private company donated the building to local government.
1-F	1-H	1-I	1-J	1-K	1-L
Shibetsu	Shirakawa	Tottori	Kitagami	Tono	Kayano
6,717	7,092	27,752	24,497	17,407	27,757
RC / 3 floors, 1 basement	RC / 4 floors, 1 basement	RC / 6 floors, 1 basement	SRC / 9 floors, 1 basement	S / 3 floors	RC / 4 floors, 2 basement
All	All	All	2nd to 5th floors, 1 basement	All	4 floors
No	No	No	No	No	Lower 2 floors
Local government (Private company)	Local government (Private company)	Local government (Private company)	Local government, Tertiary sector (same)	Local government (Private company)	Local government and Private company (Private company)
2004 / 1978	2003 / 1972	2005 / 1989	2001 / 1986	2002 / 1987	2002 / 1987
Welfare, Civic center, Rental Office	Civic center, Cultural facilities	Public office, Cultural facilities, Shop	Welfare center, Cultural facilities, Shop, Public office	Shop, Cultural facilities, Public office	Welfare, Civic center, Public Office
Local government	Local government	Local government	Local government, Tertiary sector	Local government	Local government
113.0	20.3	30.6	15.2	37.6	60.6
Bond	Prefecture	Bond	No	National Government	Bond
No	No	No	No	No	No
Undecided	Undecided	Undecided	Undecided	Undecided	Undecided
The private company donated the building to local government.	Local government did not apply any subsidies of national government because it takes much time.	Public office needed more space because the merger of towns and villages.	-	The tenant union of the large department store asked local government to financial support.	The private company donated the part of the building to local government.
1-M	1-N	1-O	1-P	1-Q	1-R
Tendo	Toyama	Kitsuki	Hanyu	Okaya	Kangae
16,590	31,918	6,736	14,988	16,374	14,546
SRC / 4 floors	SRC / 6 floors, 1 basement	S / 4 floors	RC / 4 floors, 1 basement	RC / 5 floors	SRC / 5 floors, 1 basement
2 floors	3rd floor	All	All	All	All
No	No	No	No	No	No
Local government (Private company)	Local government, partially (Private company)	Local government (Private company)	Local government (Private company)	Local government (Private company)	Local government (Private company)
1999 / 1990	1992 / 1981	1999 / 1987	1999 / 1983	2003 / 1997	1999 / 1982
Shop, Cultural facilities, Welfare center	Cultural facilities	Local government office	Cultural facilities	Shop, Cultural facilities, Welfare center	Shop, Cultural facilities, Welfare center, Office
Local government	Local government	Local government	Local government	Local government	Local government
24.2	68.2	102.4	32.7	42.4	19.4
National Government	National Government	No	Bond	National Government, Bond	National Government
No	No	No	No	No	No
Undecided	Undecided	Undecided	Undecided	Undecided	Undecided
-	Local government bought only one floor (3rd).	Local government had the public office renewal plan before conversion.	-	-	The private company donated half of the land to local government.

\*1 RC; Reinforced Concrete, S; Steel frame, SRC; Steel framed Reinforced Concrete

\*2; Temporary use      \*3 TMO; Town Management Organization

### 3.1.2 Typical conversion project

**Figs. 1, 2, 3** show a typical project (Case 1-E). Some partitions between the columns divide the large space. Air-conditioning equipment for large space is reused, it is not effective to each small rooms. Some of floors are still empty after conversion in most cases.



Fig. 1 Façade of Case 1-E



Fig. 2 Interior of Case 1-E

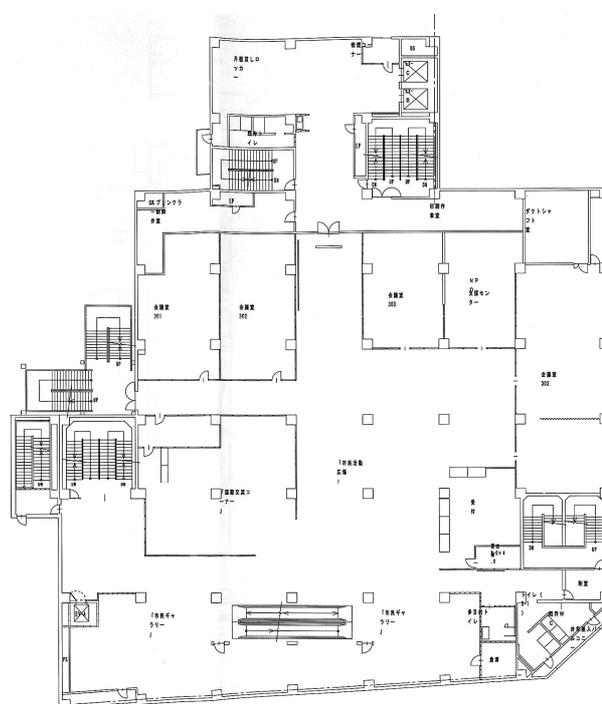


Fig. 3 Plan of Case 1-E

### 3.1.3 Conversion construction cost

When the building did seismic reinforcement, the construction cost is higher. In other cases, the cost is not so different between temporary use or not. National government subsidizes almost all cases for reactivation of local economy.

There are some uncomfortable spaces because of minimum upgrade construction in most cases. However the questionnaire to its user by local government shows that most of users accept the uncomfortable spaces because the building is public and reused.

### 3.1.4 New use

Welfare and cultural facilities are the most after conversion use. The residents requested to local government these uses. Day nursery and NPO offices are very popular because of low cost and rent and good location of the building. Free study and exhibition spaces for residents are also popular in most cases.

### 3.1.5 Land and building owner

Local government bought land and building in most cases. Some of the ex-owner donated the land or building. Almost all large department stores had been playing important role for local economy. Therefore, local government struggles to reuse the building that location is convenient for the residents.

### 3.1.6 Temporary use

Temporary use projects are Case 1-A, B, C and D.

The department store of Case 1-A is the oldest in this paper build in 1960's. The building owner plans to build a new one in near future. The rent pays local government to the owner is very cheap because the owner hopes to use for surrounding area.

On the basis of the results of the interviews with the person in charge, there are two reasons to decide the limit. The first is the term of urban planning, 10 to 15 years. The second is depreciation term of the building. For example, the depreciation term of steel and reinforced concrete structure buildings for office use is 50 years, for residential use is 47 years and for commercial use is 39 years.

## 3.2 Public school

We focused on the schools in Tokyo 23 wards, central area. We focused on the schools in Tokyo 23 wards, central area. We have 125 closed schools as of 2006 in the area and around 30 % of them converted [2]. **Tab. 2** is the list of subject projects that we could get enough information for analysis from Aug. to Dec. 2006.

### 3.2.1 Typical plan and subsidies

**Fig. 4, 5, 6** shows a typical project (Case 2-T).

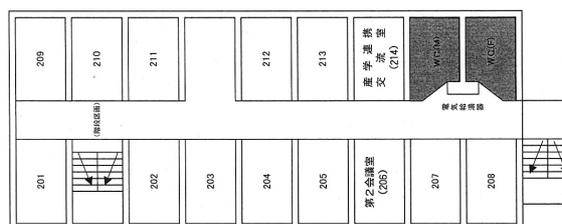
Conversion construction is minimum in almost all cases, such as addition and removal of walls. There are few cases that did seismic reinforcement or be subsidized.



**Fig. 4** Façade of Case 2-T



**Fig. 5** Interior of Case 2-T



**Fig. 6** Plan of Case 2-T

**Tab. 2** Conversion projects from public schools

Case	2-A <sup>*2</sup>	2-B	2-C <sup>*2</sup>	2-D <sup>*2</sup>	2-E	2-F <sup>*2</sup>	2-G <sup>*2</sup>
City	Setagaya	Minato	Minato	Minato	Arakawa	Toshima	Toshima
Total floor area (m <sup>2</sup> )	3,343	2,939	4,806	8,837	1,683	3,003	Unknown
Structure <sup>*1</sup> / Stories	RC / 3 floors	S / 5 floors	RC / 4 floors	RC / 4 floors, 1 basement	RC / 3 floors	RC / 4 floors, 1 basement	RC / 3 floors
Renovation year / Completion year	1975 / 2004	1988 / 2001	1960 / 1994	1984 / 2003	1960 / 2004	1965 / 2004	1973 / 2005
Ex-use	Junior High School	Elementary School	Elementary School	Elementary School	Elementary School	Junior High School	Elementary School
New use	Incubation office	Lifelong study	Cultural facilities	Welfare center	Nursery school	Cultural and Art facilities	Lifelong Study
Closed period	6 months	7 years	3 years	10 years	1 year	3 years	6 months
Period of use	5 years	Undecided	14 years	As long as possible	As long as possible	5 years	3 years
Management	Private company	Private foundation	NPO	Social welfare foundation	Social welfare foundation	NPO	NPO
Subsidy	Development Bank of Japan	No	No	No	No	No	No
Note	-	Local government pay back the part of national bond for construction cost of the school	Upper 3 floors are not in use	-	-	-	No special construction

2H <sup>*2</sup>	2-I <sup>*2</sup>	2-J	2-K	2-L <sup>*2</sup>	2-M	2-N	2-O
Adachi	Katsushika	Katsushika	Shibuya	Ota	Itabashi	Taito	Ota
654,601	1,202	Unknown	3,593	4,565	Unknown	3,047	1,773
RC / 5 floors	RC / 4 floors	RC / 3 floors	RC / 3	RC / 4	RC / 3	RC / 3	RC / 2
1957 / 2006	1961 / 2003	1951 / 2005	1962 / 1999	Around 1965 /	Around 1970 / 2006	1974 / 2003	1974 / 2006
Elementary School	Elementary School	Elementary School	Junior High School	Elementary School	Elementary School	Elementary School	Elementary School
University, Cultural facilities	University	Nursery school	Welfare center for elderly people	Community facility	Welfare center	Community facility	Incubation office
4 years	2 years	4 years	2 years	2 years	4 years	1 year	1 year
5 years + extend	5 years	Undecided	Undecided	10 to 15 years	Undecided	Undecided	Undecided
University foundation	University foundation	Private company	Tertiary sector	NPO	Local government and NPO	Private foundation	Private foundation
No	No	No	National government	No	Tokyo metropolitan	National government	No
Seismic reinforcement, extension	Upper 3 floors are not in use	-	-	Seismic reinforcement	-	-	-

2-P <sup>*2</sup>	2-Q <sup>*2</sup>	2-R <sup>*2</sup>	2-S <sup>*2</sup>	2-T <sup>*2</sup>	2-U <sup>*2</sup>	2-V <sup>*2</sup>	2-W <sup>*2</sup>
Minato	Taito	Chuo	Chuo	Minato	Arakawa	Minato	Sumida
2,800	4,524	3,877	4,481	3,399	1,376	2,390	1,235 (1st and 2nd floors)
RC / 4	RC / 3 floors	RC / 3 floors	RC / 3 floors	RC / 3 floors	RC / 4	RC / 4 floors	RC / 4 floors
1958 / 2002	1928 / 2004	1928 / 2000	1929 / 2000	1928 / 1995	1963 / 2001	1969 / 2004	1976 / 2001
Junior High School	Elementary School	Elementary School	Elementary School	Elementary School	Junior High School	Elementary School	Elementary School
NPO office	Incubation office	Welfare center	Incubation office, Cultural facilities	Office	Incubation office	School, Incubation office	Incubation office, Cultural facilities
2 years	1 year	1.5 year	8 years	4 years	6 months	4 years	2 years
5 years	5 years	As long as possible	10 years	around 12 years	6.5 years	5 years	5 years
Local government and NPO	Public sector	Public sector	Public sector	Public sector	Public sector	Public sector	Public sector
No	National government	No	No	No	No	No	No
-	-	Upper 1 floor is not in use	Seismic reinforcement	-	-	Seismic reinforcement	Upper 2 floors are not in use

\*1 RC; Reinforced Concrete, S; Steel frame \*2; Temporary use

### 3.2.2 Process of the school closedown

The most numerous reason of the public school closedown is declining birthrate.

Public sectors have the principle that public lands and buildings should be public use as long as possible. The location of public schools is very good especially in Tokyo central area. Therefore, public sector examines new use correspond to social change.

Concerning the time from close to conversion, some are around 1 year in the cases that local government had decided the conversion plan before close. Others are a few years.

### 3.2.3 New use

The most numerous use is welfare facility for elderly people, secondly community space and childcare and thirdly NPO and incubation offices. Residents participate the decision making process in most cases.

In Case 2-P, NPO offices, tenants do not want to move because the rent is much cheaper than usual. Therefore, it is difficult to scrap the building and realize the redevelopment plan.

### **3.2.4 National bond for construction cost of public schools**

When local governments build public schools, national government grant them bond for part of the construction cost. In that case, local governments have to use the school building for educational use for a fixed period of time. If they change the use, they have to back the part of subsidy. In Case 2-B, local government pays back the bond.

Recently, the pay back is not necessary when the use is for public use and 10 years have past after construction by deregulation in 2002 and local government have regeneration program by deregulation in 2004. After that, the number of conversion project is increased.

### **3.2.5 Temporary use**

In most cases, local government is examining the redevelopment plan of surrounding area among the school. It takes much time to decide the plan usually. Therefore, temporary use limit is until the plan decided in some case. Moreover, the time and labor for administrative procedure of temporary use are much less than redevelopment plan.

### **3.2.6 School sites utilization**

As for the investigation by government in 2002, 60 public elementary schools closed and 24 of them tare down the building in Tokyo 23 wards. The most numerous new use of the 24 new buildings is welfare facility for elderly people, secondly community space and nursery because of the declining birthrate and aging society problem in Japan.

## **3.3 PFI project**

PFI law established in 1999 in Japan. We have 276 PFI project as of May 2007; 17 projects are reuse of existing stock and 4 are conversion among them. We investigated all 4 projects (**Tab. 3**) but they are very few. Therefore, we focused on especially business merit and management.

### **3.3.1 Business merit of PFI**

Business merit of PFI project for public sectors is that it enables to supply public services lower cost. Moreover, it expects that the quality of the services become better by know-how of private sector.

Business merit for private sectors is that stable income is guaranteed during contract period. Moreover they win social confidence because PFI project is a kind of public work. All private sectors in these subject projects wish to prolong the contract period.

### **3.3.2 Risk management**

Business risks are divided between public and private sectors on the contract before construction starts in PFI project. It causes the problem when the private sector deals with the troubles not noted on the contract.

### **3.3.3 Period of contract**

Physical strength of the building decides the period of temporary use in Case C-4. In other cases, local government calucrates the most effective time for them.

**Tab. 3** Conversion projects from PFI projects

Case	C-1	C-2	C-3	C-4
City	Nagoya	Okayama	Hachioji	Jouetsu
Total floor area (m <sup>2</sup> )	16,400	19,000	14,061	10,160
Structure <sup>*1</sup> / Stories	RC / 3 floors (two buildings)	RC / 7 floors, 1 basement	RC / 3 floors	S / 3 floors
Building Owner	Port of Nagoya	Okayama Prefecture	Tokyo metropolitan	Jouetsu city
Renovation year / Completion year	1962,1952 / 2005	1961,1980 / 2005	1990 / 2005	1985 / 2001
New use (ex-use)	Shopping mall (Warehouse)	Welfare center (Hospital)	Youth plaza (High School)	Cultural facilities (Department Store)
Developer	Finance, Resort company	Constructor, Building management company	Finance, Railway company, YMCA	Constructor, Building management company
Conversion cost (1,000 yen per sq.m)	142.5	157.9	Unknown	107.3
Seismic reinforcement	Yes	Yes	No	No
Period of contract	15 years	17 years	10 years	20 years
Reasons (why public sector decide the period of contract)	15 years is shorter than other PFI project, but it is appropriate for commercial use.	15 years is the best cost effectiveness and add 2 more years for design and construction.	20 years is too long and risky for private sector, so there was no tenders in the other PFI project by same public sector. Therefore, 10 years is better in this case.	The depreciation term of the building is 34 years and remains 20 years when the project starts. The public sector wants use it as long as possible.

\*1 RC; Reinforced Concrete, S; Steel frame

### 3.4 Comparison analysis

#### 3.4.1 Large department store

After conversion, they have some extra floors and space in most cases. Some local governments gradually use extra space corresponding with the new demand.

There are few differences in conversion construction and new use between temporary use or not. The building owner is not changed in temporary use cases.

National government subsidies for reactivation of local economy grant to almost all cases.

#### 3.4.2 Public school

Almost all projects are temporary use and the buildings will be tear down. New uses of temporary use and new buildings are almost same, such as welfare, incubation office, community space and so on.

Some of the tenants refuse to withdraw because of cheap rent.

Deregulation for conversion promotes the temporary use.

#### 3.4.3 PFI project

PFI project will be able to adapt many uses, such as commercial use only in Case C-1, comparing the other public conversion projects. Physical strength of the building decides the period of temporary use in Case C-4.

## 4 Conclusions

Conversion for temporary use is effective corresponding with the demand for new public service by social change. All the building owners of temporary use projects are same in this paper. Not physical strength of the buildings but urban planning decides the period of temporary use.

There are two significance of the conversion for temporary use. First one is that it keeps the building core in its surrounding area because the administrative procedure is shorter than scrap and build. Second one is that it utilizes extra space, such as vacant

schools and unoccupied floors of large department stores, to be more flexible with the new demand.

The issue of temporary use is to reflect the result of emerged new demands to the redevelopment plan as a next stage.

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