

# auri research brief

No. 14

---

**Kim, Eun Hee**  
Associate Research Fellow

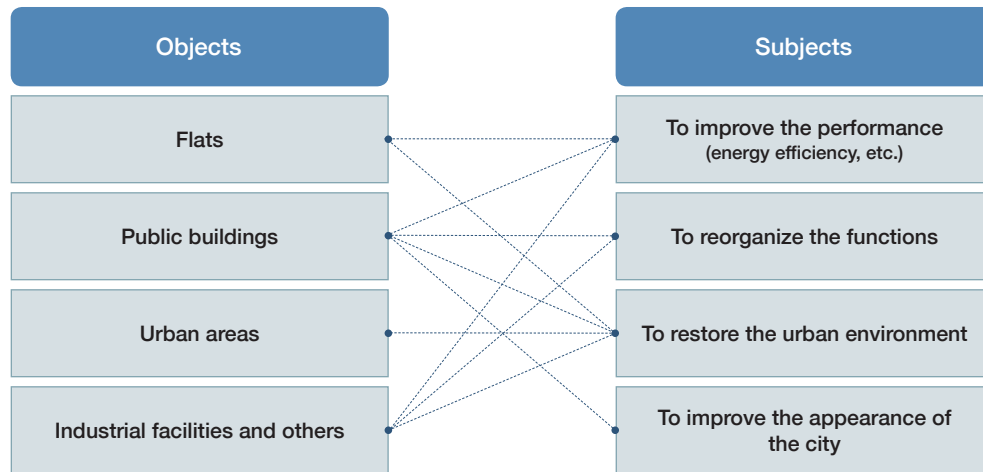
**Youm, Chirl Ho**  
Research Fellow

## **Study on Policy Support and System Improvement of Remodeling for the Enhancement of Utilizing Public Buildings**

This study has been performed to prepare direction of policy and the establishment of an alternative system which would respond to the requirement of the functional switch against physical aging of public buildings, the changing social conditions, and would enhance utilization. For a particular scope, we have defined the study to only include Korean public buildings, and as for the contents, we have installed a policy and code system related to the remodeling of public buildings and the state of the foreign remodeling-related policy and system. For the execution of this project, we have performed various research on policy related to remodeling and status of system, current condition of remodeling and examples from Japan and the US. On this basis, we have proposed problems related to the policy and the remodeling system of current public buildings and improvement measures for enhancing utilization.

First, we have observed the current state of the Korean policy and system related to the remodeling of public buildings according to contents available. In Korea, policy regarding public buildings can largely be divided into two aspects, adopting objects vs adopting subjects. Objects of policy are composed of flats, public buildings, industry facilities and residential areas which affect social and economic situations, and each object. According to each subject, is treated

within the view of performance improvement, energy efficiency improvement such as function rearrangement, usage change, city recycling and local utilization. Since these policies have a different execution process related to the government departments, though performing with the same objects, they can be defined into special buildings or a different supporting scope, so it would be judged to have caused a performance difference in the execution of remodeling.



The Objects and Subjects of the Policy on the Remodeling Work

For a remodeling related system of public buildings, we have reviewed laws in regards to remodeling, project processing and maintenance. In terms of laws, Korea has definitions related to remodeling which are an administration process, planning, design and inspection, mitigate capacity and special allowances, project execution and financial support, maintenance and performance renovation, usage and disposal, and a security system, etc. In addition, in terms of such laws, they are under the control of various Acts, such as the Building Act, the Housing Act, the Green Building Construction Supporting Act, etc. Each Act has its own purpose and related objects and methods and as such, the remodeling-related regulations are not the same.

We also have reviewed laws and systems for establishing public buildings along with remodeling. In general, for public building establishment, it can be divided into planning, construction and maintenance, and each stage has its own related laws. For major contents of the planning stage, it requires project plans, feasibility research, analysis, and basic plans; for the design stage, project procurement, contracts, and basic and working design, inspection and

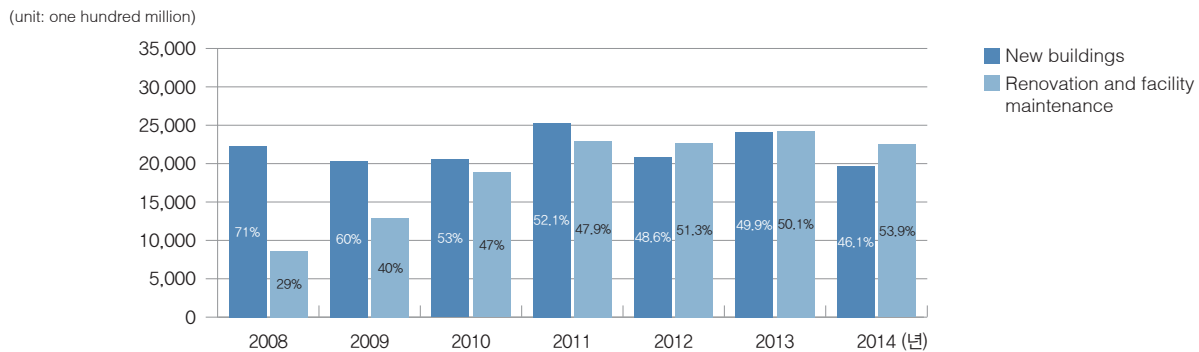
construction management execution, and evaluation work is needed; for the construction stage, construction ordering, contracts, construction, inspection and construction management, and performance evaluation. Each stage has been the base of new building construction and we assumed that the remodeling related regulation was not sufficient.

Meanwhile, the maintenance related system of public buildings operated by public institutions is as follows: General system of facility information management of the Korea Infrastructure Safety Corporation; SEUMTER system and; Building Life Cycle Management System of the Ministry of Land, Infrastructure and Transportation, based on documents from an administration system in SEUMTER. For the general system of facility information management, according to the Special Act on the Safety Control of Public Structures, it is defined as a first class or Second class facility, not to include all public buildings, and in addition, it includes civilian buildings, so there is some limit to use such information as general control data.

SEUMTER, the Architectural Administration System, as an operating program based on web infrastructure, is the most realistic system because it integrates architecture drawings and documents. However, it needs separate work for the use of data for maintenance of long-term public buildings as its system is oriented for administration processes regarding the important information. For improvement of these problems and providing a complex information service oriented for architecture buildings, a Building Life Cycle Management System is under construction. On the other hand, with the architecture control system of the Ministry of Land, Infrastructure and Transportation, the National Public Building Center, it is also establishing a middle and long-term database construction process for the efficient control and use of public buildings. In addition, it is in the midst of researching the integrated database for the construction of public buildings as a national property, not to mention functional objects.

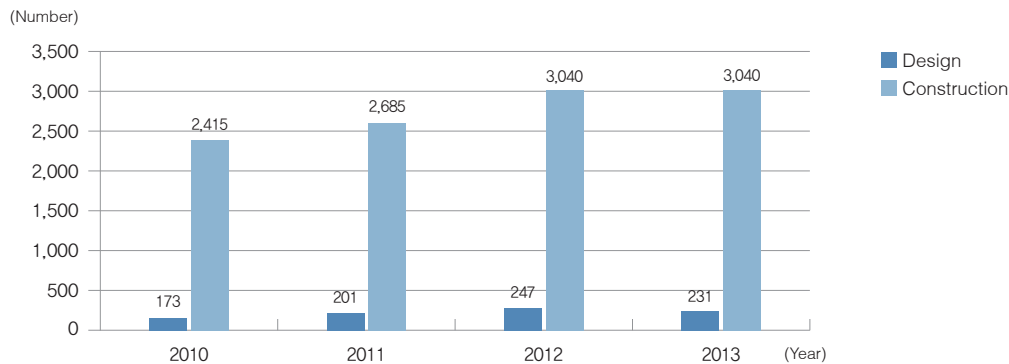
We have reviewed the real remodeling execution state of public buildings following the research and analysis of the policy and system related on remodeling. In Korea, there are approximately 190,000 buildings in total, which amounts to approximately 2.7% of around 6,900,000 of a national total. In 2013, 13,000 buildings had annual contracts and if this is converted into KRW the total amount of contracted buildings has now reached approximately 16.6 trillion won. As for public buildings, the number of new constructions has been declining since the mid-1990s, and relatively, the amount of older existing buildings has been increasing. From this point of view, it is possible that old-aged public buildings requiring full remodeling will reach a maximum of 70% by 2025.

Meanwhile, from 2008 to 2014, in a review of the planned budget state related to public buildings managed by government, the new amount of buildings was 2.2 trillion won, or 71% of the total amount and maintenance cost was 0.9 trillion won or 29%. In 2014, the new building budget was 1.97 trillion, or 46% and the maintenance budget was 2.3 trillion, or 54%, causing considerable changes in budget volume. With this change, remodeling related design and construction budgets of Public Procurement Service's ordering has been increasing continuously. For budget classification, the maintenance number has shown 48% of design and 57% of construction, which were higher portions, followed by 21% for extensions or reconstruction work (design), and 30% for interior architecture (construction).



#### The Current Status of the Budget for the Public Buildings under the Jurisdiction of Government Departments

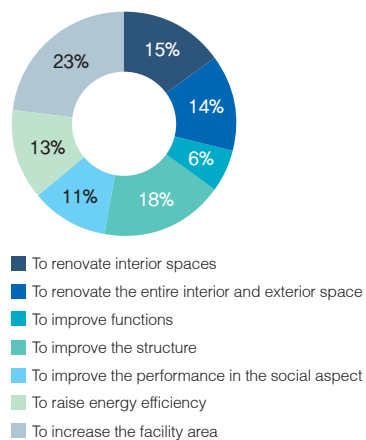
\* Source: Ministry of Strategy and Finance, The budget proposals of the government revenues and expenditures by business from 2008 to 2014



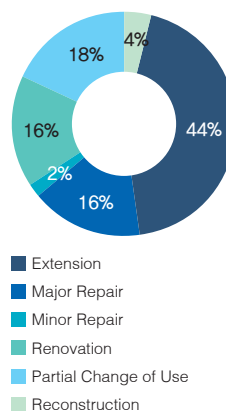
#### The Number of Annual Remodeling Businesses of Public Buildings

Based on SEUMTER, we have researched the remodeling state of Korean buildings followed by the budgets and ordering state. According to results, approximately 85,500 from a total of 3.5 million, or 24% of buildings have executed remodeling related works after the building has been completed. About 590,000 cases of remodeling were building extensions, or 69% of all remodeling, and 23,400 case of remodeling accounted for usage changes. In addition, after research was conducted on the Property Management General Ledgers of 1,000 public buildings and their architecture history, we have confirmed that most of the buildings have underwent extensions either once or twice in a 10-year cycle, and in the case of buildings over 20-years, they have often executed usage changes and repairing work.

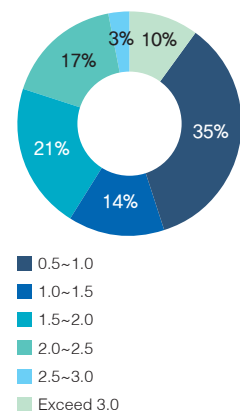
We also reviewed the major contents of the remodel planning stage along with the public building establishment state. In general, the purpose of remodeling projects of public buildings was energy efficiency improvement and usage area extension. Extension works in architecture type was the highest, and works between 10 billion won and 20 billion won of the budget was the highest. In addition, the construction unit cost was fixed between 500,000 won and 1 million won in research. For example, after an analysis of remodeling the execution of public buildings, we have judged that the buildings have achieved comfortable improvement in physical conditions in general. However, for some facilities, utility improvement was lacking which caused a reduced effect of remodeling work, or, due to insufficient budgets, they had limited project completion by omitting earthquake-proof measurements, etc. In general, the initial projects did not have established basic plans, so they have not fixed the budget scope, causing the inclusion of additional works during construction and difficulty of acquiring budgets for such works.



The Purpose of Remodeling



The Type of Remodeling



The Construction Expense per Remodeling

Based on the Korean public building remodeling state and past situations and problems, we have reviewed the policies and systems of the US and Japan, and have derived several conclusions. In both countries, established separated control on public buildings is in place; supporting organizations are installed and; there are several manuals managed and utilized by a system. This gives us many important points to consider. In the PBS(Public Buildings Service) of the US, the system performs inclusive works from planning of new construction and remodeling of public buildings to the maintenance stage for effective use of such buildings; it has separated programs for remodeling related public buildings and; it has specified a concrete execution method for the organization and document processing of projects through the management of remodeling related manuals. In addition, with the help of systematic installing of a database related to evaluation for feasibility on remodeling projects, project plans, and budget execution plans, etc., efficiency for project execution with an information-open policy has been improved.

Japan is promoting the preservation of public buildings based on laws of the Act on Public and Government Facility Construction and other related Acts. They are proceeding with the share of information with national authorities and levels of local government through regular communication meetings centered around the engineering departments of the Ministry of Land, Infrastructure, Transport and Tourism, Japan, and by government related institutes such as the Architecture Reservation Center, the Public Architecture Institutes and the Long-life Building Promotion Institute, etc. They provide various standards, guidelines and manuals.

In addition, they provide information with BIMMS-N (departments of government buildings and public buildings of national authorities) and BIMMS (architecture reservation centers and public buildings of local governments) which represent the public building information system, in which such information can then be confirmed. In the departments of government buildings, they are comparing cost predictions in the coming 80 years for goals acquired by new construction and remodeling projects, etc.; reviewing cost comparisons for new projects and; constructing systems considering building management from the early stage of project planning.

In consideration of the aforementioned remodeling state of public buildings and overseas remodeling related policy and system contents, we have proposed problematic areas and points of improvement for current Korean remodeling projects. To begin with, relating to policy, we have provided two problems. Firstly, in spite of economic and social improvement enhancements from public buildings, there is little recognition of public authorities and the general public about the value of utilizing such buildings; Secondly, there is no principle for mid and long-term policy establishment based on the standard planning of remodeling. We have provided two improvement points for these problems. Firstly, a consistent mid to long-term

remodeling policy road map connecting with basic plans of the Master Plans on Architectural Policy is necessary; secondly, expanded effort and support for developing recognition on the value and importance of remodeling is required.



The Direction of the Policy on Public Building Remodeling

We have classified three problems and improvement directions regarding the systematic review of the developing public remodeling. Firstly, remodeling related regulations need to be included in several laws; it is short of compatibility even if they have the same contents and because of different sections of regulations in individual law, problems regarding the confusion of law adoption in the remodeling execution process or common equity. Secondly, laws and regulations regarding remodeling character are in shortage, which differ from that of new construction. Thirdly, it is difficult to understand systematically about the public building remodeling state. For improvement of these problems, firstly, we have to provide a solution to prevent confusion during the execution process by enhancing the compatibility regarding regulations related to remodeling. Secondly, we have proposed an improvement of laws and regulations in regards to the idealization of planning for the reflection of remodeling the character of buildings. Lastly, we have proposed amendment of laws and regulations for the improvement of execution force of public architecture supporting centers, currently specified in the Architecture Service Industry Promotion Act, for the complementation of a maintenance system of public buildings.

For achieving execution authority for policy direction of remodeling of public buildings and system improvement measures, the results of this study show that a mid to long-term strategy is necessary. As mentioned above, remodeling of public buildings is one of the actions which are set to take place in the course of utilizing and in the maintenance process of existing buildings. For this purpose, it is necessary to construct information on existing buildings and to prepare a system of recording each maintenance state. Based on this strategy, once remodeling plans and budgets are established with the assistance of installing a work scope, the strategy shall be executed more efficiently and an expected performance shall be achievable.

**Key words :** Public Building, Remodeling, Policy Road Map, System Improvement

