

POST-OCCUPANCY EVALUATION (POE) AFTER THE EXPANSION OF AN APARTMENT PARKING LOT

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ABSTRACT: Despite the serious lack of parking lots, studies on parking lot expansion are insufficient; research on users' satisfaction following parking lot expansion is practically nonexistent. Therefore, this study sought to provide basic data for the parking lot expansion of old apartments by comparatively analyzing users' satisfaction before and after the parking lot expansion through a questionnaire survey that targeted residents benefiting from the expanded parking lot. Results revealed a low post-occupancy satisfaction with the parking lot expansion despite the parking lot expansion and improvement of the parking lot environment. This was because the parking lot was not expanded up to the second basement floor due to the lack of appropriate parking space. Other factors included the construction cost burden and lack of connectivity of the basement parking lot with elevators. The results actually raise the need for the establishment of an optimally suitable expansion plan and development of method and technology requiring lower cost and shorter construction period in the design and construction processes for parking lot expansion. Through post-occupancy evaluation (POE) after parking lot expansion, this study quantitatively identified the problems associated with the parking lots of old apartments and ensuing expansion effects. The findings in this study can be used as basic data to seek a suitable diagnosis and evaluation method for the parking lots of old apartments.

Keywords: *Expanding the Apartment Complex Parking Lot, Post-Occupancy Evaluation(POE)*

1. INTRODUCTION

The increase in the number of vehicles owned by individuals as a result of national income improvement has given rise to a serious problem of lack of parking lots. For old apartments in particular, adjacent roads have been turned into parking lots; this causes not only serious traffic congestion but also social problems, i.e., emergency situations cannot be handled properly. Although old apartment remodeling is debated on as a measure for coping with such problems, studies on parking lot expansion are still insufficient. In a survey on the demand for the remodeling of old apartments, most occupants believed the lack of parking lots should be prioritized. This was because the parking lot installation criteria were met at the time of apartment construction completion, yet the parking lot did not satisfy the current laws and regulations and residents' needs. In this context, few studies on usability, convenience, and satisfaction following parking lot expansion have been conducted even as demand for parking lot expansion has risen. Therefore, this study aimed at presenting basic data to seek a suitable diagnosis and evaluation method for parking lot expansion for old apartments through the POE of parking lot users.

2. METHODOLOGY

This study evaluated user satisfaction following parking lot expansion through a survey questionnaire that targeted the residents of Bangbae OO Apartment Complex, which had undergone parking lot expansion. The survey covered residents' pre- and post-satisfaction with parking lot expansion and allotment in terms of the number of cars that can be parked, parking lot expansion mode, and access mode to individual apartment building following the parking lot expansion.

3. SUBJECT COMPLEX AND SUMMARY OF THE QUESTIONNAIRE SURVEY

3.1 Targeted APT Complex

The construction of Bangbae OO Apartment Complex was completed in 1978; remodeling was completed in 2007. As one of the most recent remodeling cases, the apartment complex began to be occupied anew by residents in January 2007. The APT complex consists of 3 main buildings and 216 households. Remodeling was carried out for the entire complex including the expansion of household units and basement parking lot; ditto for outdoor space remodeling. The complex was selected as the survey subject since it was in line with the study purpose, i.e., elevators were extended to the basement through the structural improvement of elevators in line with the expansion of the basement parking lot.

Table 1. Summary of APT Complex Remodeling

Location/Area	000-o, Bangbae-dong, Seocho-gu, Seoul, Korea	
Complex size	Three 12-story APT buildings with 216 household units	
Remodeling period	July 2005 ~ December 2006	
Details of remodeling	Household unit expansion	7 m ² ~ 11 m ² (30% expansion from the previous size)
	New installation of basement parking lot	78 cars (ground level) → 207 cars (ground level: 80 cars + 1st basement level: 127 cars)
	Core mode change	Corridor style → Stair style (new establishment of core)
	Elevator structure improvement	Extension of elevator down to the basement level (stair style)

Table 2. Summary of the Questionnaire Survey

Survey period		Feb. 1~2, 2009			
No. of households		BD No. 102 (115.7 m ²)	BD No. 103 (148.8 m ²)	BD No. 101 (175.2 m ²)	Total
		84 (73)	60 (50)	72 (53)	216 (176)
No. of collected questionnaires		16	13	16	45
Respondent features	Gender (persons)	Male		Female	
		29 (64%)		16 (36%)	
	Age	21 ~ 69 (average: 52)			
	Period of occupancy prior to remodeling	2 ~ 23 years (average: 14 years)			
	Family members	About 4			

3.2 Questionnaire Survey

This study targeted 176 household residents who completed re-occupancy among the 216 households of 3 APT buildings for a questionnaire survey conducted for about a week on February 1~9, 2009 for POE following the parking lot expansion. As a result of the onsite distribution of questionnaires and one-on-one interviews, 45 households were considered in the survey. The summary of the survey analysis is presented in Table 2.

The questionnaire dealt with the satisfaction before and after remodeling as well as with the no. of vehicles that can be parked per household, parking lot expansion mode, and access mode to individual apartment building following parking lot expansion; it consisted of five-point scale questions on satisfaction and multiple choice questions.

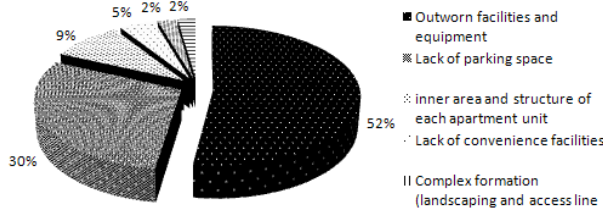
4. QUESTIONNAIRE SURVEY ANALYSIS

4.1 Pre- and Post-Remodeling Satisfaction

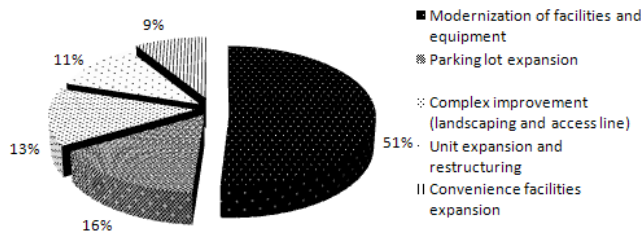
Pre-remodeling issues included outworn facilities and equipment as well as the lack of parking space followed by inner area and structure of each apartment unit, complex formation (landscaping and access line), and lack of convenience facilities. For post-remodeling satisfaction, facilities and equipment modernization recorded the highest ratio followed by the expansion of parking space, complex improvement (landscaping and access line), unit expansion and restructuring, and convenience facilities expansion. With regard to the post-remodeling issues, the lack of parking space had the highest ratio followed by the inconvenience of use of convenience facilities, noise between floors, actual apartment unit size and inappropriate layout, and improper complex formation (landscaping and access line). While post-remodeling satisfaction with parking space was 16%, non-satisfaction with parking space was

51%. This suggested the low satisfaction with the parking lot expansion.

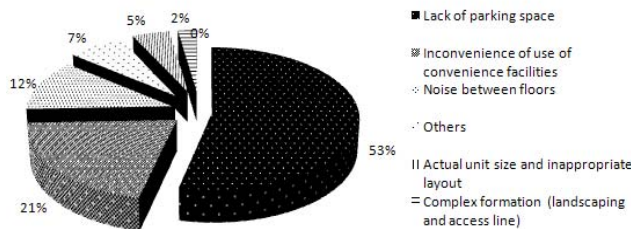
Outworn facilities and equipment, Lack of parking space, Inner area and structure of each apartment unit, Lack of convenience facilities, Complex formation (landscaping and access line, others/ pre-remodeling issues)



Pre-remodeling issues



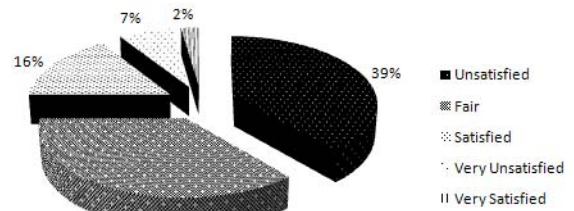
Post-remodeling satisfaction factors



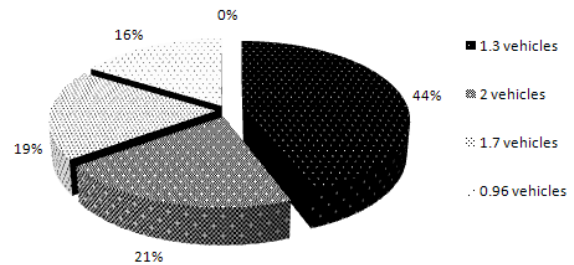
Post-remodeling issues

4.2 Satisfaction with the No. of Vehicles That Can Be Parked Per Household

The no. of vehicles that can be parked per household after remodeling rose from 0.36 to 0.96. In terms of satisfaction, "very unsatisfied," "unsatisfied," and "fair" exceeded 80%; thus reflecting the low satisfaction with the no. of vehicles that can be parked per household. Majority of the respondents believed that the appropriate no. of vehicles that can be parked per household was 1.3; others cited 2 and 1.7. Very few believed that the current 0.96 was appropriate.



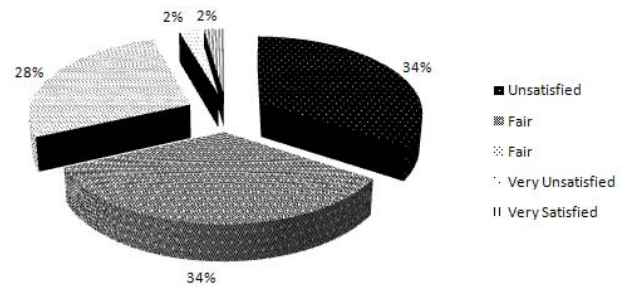
Satisfaction with the No. of Vehicles That Can Be Parked Per Household



No. of Vehicles That Can Be Parked per Household

4.3 Satisfaction with the Parking Lot Expansion Mode

The parking lot expansion of the targeted APT complex was carried out as follows following remodeling: "1 floor aboveground + 1 floor underground." As a result of the survey on the satisfaction with the parking lot expansion mode, most responses were "unsatisfied" and "fair"; few answered "satisfied," which implied the relatively negative opinion of the respondents. For the appropriate parking lot expansion mode, most respondents preferred the "basement parking mode" or the plan to make the entire APT ground into landscaping space and favored building only a basement parking lot. Only a small number of respondents selected the current parking lot expansion mode, i.e., "1 floor aboveground +1 floor underground."



Satisfaction with Parking Lot Expansion Mode

5. QUESTIONNAIRE SURVEY RESULTS

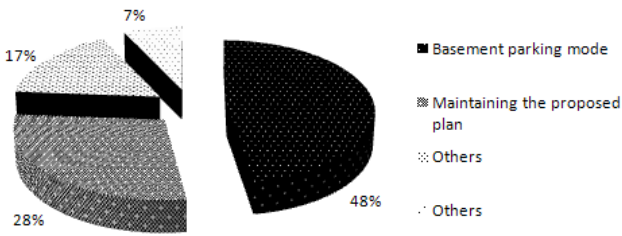
Based on the questionnaire survey result, respondents' satisfaction following the parking lot expansion was low in general.

1. Although 52% were unsatisfied with outworn facilities and equipment, and 30%, with the lack of parking space before remodeling, 51% expressed satisfaction with the modernization of facilities and equipment. At least 53% were unsatisfied due to the lack of parking space. These implied the relatively low satisfaction with the parking lot expansion.

2. After the parking lot expansion, the no. of vehicles that can be parked per household rose from 0.36 to 0.96. Nonetheless, only 16% expressed satisfaction; 84% of the respondents wanted an allotment of 1.3 vehicles per household.

3. With regard to the satisfaction with the parking lot expansion mode of "1 floor aboveground +1 floor underground," majority preferred the "basement parking lot mode" wherein the entire grounds are planned as a green area; only 28% selected the current parking lot mode. In other words, satisfaction was relatively low.

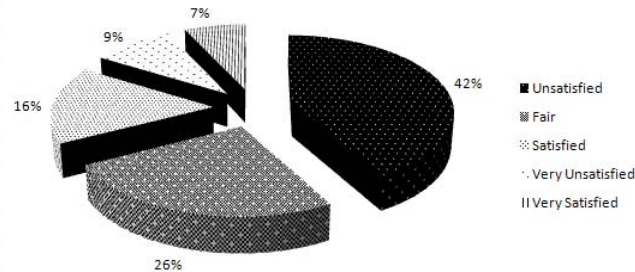
4. Currently, residents go to their respective apartment units using the stairs from the basement parking lot followed by the elevator. For the satisfaction with the access mode to the individual APT buildings from the basement parking lot, most of the respondents claimed to be "unsatisfied"; 62% expressed preference for "direct connection by elevator."



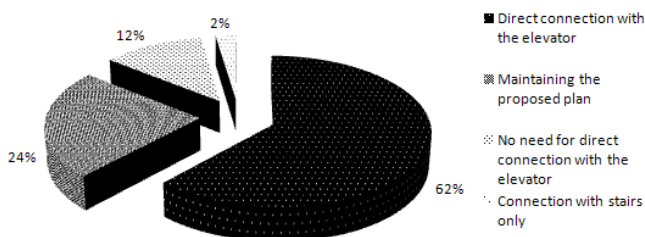
Proper Parking Lot Expansion Mode

4.4 Satisfaction with the Access Mode to Individual APT Buildings

The access mode to individual APT buildings¹ involved using the stairs from the basement parking lot and taking an elevator to go to one's apartment unit. With regard to this item, "unsatisfied" was cited the most: "Very unsatisfied," "unsatisfied," and "fair" were cited by 77% of the respondents. Users' satisfaction with the access mode to the individual APT buildings from the basement parking lot was low in general. Users preferred direct connection to their apartment units via elevator the most, with only a small number of respondents claiming that they were satisfied with the current mode of using the stairs followed by the elevator.



Satisfaction with the Access Mode to Individual APT Buildings



Proper Access Mode to Individual APT Buildings

6. DISCUSSION

The Bangbae OO APT Complex as the target of the questionnaire survey in this study is a case that shows the recently planned parking lot trend. For POE, this study conducted a questionnaire survey and drew several findings. Based on the results of the questionnaire survey, the respondents were satisfied with the modernization of facilities and equipment in general; note, however, that complaints were raised in almost all items such as the no. of vehicles that can be parked per household. Issues regarding the preference for basement parking mode and direct connection between the basement parking lot and elevator were also raised. This was probably because the expansion was carried out by reflecting all residents' economic efficiency even as underground construction should be carried out considering the existing building's safety. Moreover, there were limitations in construction owing to the different conditions compared to the new construction. In this context, the development of construction method and technology requiring lower cost and shorter construction period is essential in parking lot expansion based on an optimal expansion plan including the APT complex conditions in the design and construction phases.

For the access mode to the individual APT buildings from the basement parking lot, most of the respondents raised the issue of connectivity between the basement

¹ The access mode from the basement parking lot involved going up to one's apartment unit through an elevator from the newly built basement parking lot.

parking lot and elevator. Solving this issue is a matter of urgency.

7. CONCLUSION

In Korea, studies on old apartment remodeling are actively conducted due mainly to the increase in the number of cases of apartment remodeling. Note, however, that studies on parking lot expansion in response to the lack of parking lots are insufficient. Studies on usability, convenience, and satisfaction following parking lot expansion to address the problem of insufficient parking lots are not actively undertaken. This study evaluated user satisfaction following parking lot expansion. Through POE, this study identified the problems associated with the parking lot expansion of old apartments. The findings in this study can be used as basic data to seek a suitable diagnosis and evaluation method for the parking lot expansion of apartments.

Only one APT complex was considered for the questionnaire survey because there were very few cases of parking lot expansion. Accessibility to such APT complexes was also very limited. Consequently, there were many difficulties in drawing significant findings due to the small number of respondents in the questionnaire survey. Moreover, the accuracy of satisfaction evaluation may be low; hence the difficulty in deciding the success and failure of the parking lot expansion of old apartments based only on the findings in this study. Through more case studies, the limitations in this study should be addressed in future research.

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