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Urban simulation evaluation with study case of the Singapore Management University, Singapore

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Abstract. This paper reports and discusses about the urban simulation evaluation with a study case, The Singapore Management University (SMU), the first major university to be located in the city centre. It is located in Bras Basah District, with some controversy on the geographical establishment, the physical realization of the University in the original plan required some demolishes, urban historical building, a public park and in the end will impact the lose of some certain qualities of the urban space. From this case we can see that the urban design and cultural heritage principles could come into conflicts with the more practical concerns of space constraints and transportation efficiency. This SMU case reflect the problem of the developing countries that have to decide between conservation of buildings and green spaces and space demands. In this case, for Singapore, it marks a progress in the step of greater community involvement in the planning process.

Keywords: land use, urban simulation, urban evaluation.

1. Introduction
The Singapore Management University (SMU) is a new university established in year 2000, Singapore’s third major university, with 6000 students enrolled currently. It currently occupies four plots of land. It will be gradually expanded to up to eight plots covering 238,000 square metres with a target student population of 15,000 [1]. The difference between this university and the other two long-established universities in Singapore is that this is the first major university to be located in the city centre. It is located in the bustling and lively Bras Basah District [1]. But its geographical establishment is not without controversy, as the physical realization of the University in the original plan required some sacrifices including the demolition of a well-loved building of the National Library, the lost of a public park which is an important green lung of the city, and the loss of certain qualities of the urban space such as the visual impact. On this research, the research method is descriptive analysis with The Singapore Management University as object study or research. The aim of this paper is to emphasize the need of community involvement (the ‘skilled citizen’ and ‘unskilled citizen’) in urban planning in this case Singaporean.

2. Research Method
The object of study is the Singapore Management University (SMU), the plots covering 238,000 square metres. It is located in Bras Basah District, Singapore [1], [2]. The method used is descriptive analysis method. Data were collected by survey and field observation as a primary data to feel the space of location and social aspect in surrounding area. In the sometimes, study of literature as a
secondary data for supporting knowledge in the application of theory in the object study or research area.

3. Results and Discussion

3.1. The Case

The original urban plan of the SMU (Figure 1) was crafted by the national planning authority: the Urban Redevelopment Authority (URA) [2], which proposed that the new university campus be located in the Bras Basah District. It was also known as the ‘Museum District’ because of the existence of a number of museums, as well as colonial buildings of historical value, and private educational institutions [3]. The plan of SMU falls in line with the vision of the URA to establish the Bras Basah District as a cultural and educational hub of the city [2].

![Figure 1. Master plan showing the sites of the SMU](image)

“E” (Educational) – Proposed sites of SMU, Area bounded by green lines – original size of Bras Basah Park, Area bounded by red lines – original site the demolished Old National Library, Area bounded by blue lines – new Fort Canning Tunnel

The original plan, however, had several points of contention that have been brought up by urban planners, architects and local Singaporeans. Some of these have stronger social concerns (cultural and natural resources at stake), and some are more of a technical concern (such as traffic generation). These contentions prompted strong public debates and involvement in the planning process that is seldom seen in Singapore. Some urban planners and architects proposed alternative plans in the attempt to salvage the cultural and natural resources that are threatened by the new plan. These are outlined as follows:

3.1.1 The loss of the Old National Library

The Old National Library is regarded as a national icon to many Singaporeans. It was built in 1960 and was demolished in 2004 [3], despite strong public dissent, to give way to the new SMU and the new Fort Canning tunnel.

Rationale of Plan: The URA recommends for the demolition of the Old National Library because there was a strong (future) need to build the Fort Canning vehicular tunnel to facilitate heavy traffic going to and fro the central business district to the shopping belt, which crosses Bras Basah, as well as for anticipated new road users coming to the new SMU campus [2].

Also the URA deems that the Old National Library to be “not of great architectural merit and should not be conserved”.

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Evaluation: Failure to conserve a monument but planning process was participative and included many public opinions. Despite the ‘negative’ result of the demolition of the library even after a series of public debate, this issue has created substantial public awareness and generated a level of public participation that is seldom seen in Singapore. Yet on the other hand, some harsher critics note that despite a strong public dissent and even the submission of alternative plans to save the Library, the original plan has been implemented.

3.1.2 The Bras Basah Park reduces in size

The map (Figure 2) give a visual explanation of the establishment of the various buildings of the campus (indicated by “E”) can result in the reduction of the size of the Bras Basah Park.

Rationale of Plan As seen by the micro urban structure here which is quite densely built-up, as well as height restrictions for this area, it offers less flexibility for the location of the buildings of the campus. Thus the proposal is to take some parts of Park, and including the Old National Library to be used for the new campus.

Evaluation: The Bras Basah Park has served as a green lung of this fairly dense area. In its original dimensions, the park can be seen as a connector from the densely built-up city to the Fort Canning Park. However with the reduction in size of the Bras Basah Park, there is left just a tenuous link to the Fort Canning Park, as represented by the little strip of green.

3.1.3 Traffic volume generation/ New Tunnel

The construction of the Fort Canning is to fulfil the aim of relieving the heavy load of anticipated (even current) traffic that comes into and passes through Bras Basah District [4]. Considerations have been made to design the road to go under the Fort Canning Hill instead of cutting through it to protect the historical and natural significance of the hill. Although the tunnel is underground, the exit of the tunnel is at the location where the Old National Library was, and thus it had to go.

3.1.4 Visual quality and “Space Syntax”

Yet the purpose of maintaining visual corridors goes beyond satisfying aesthetical requirements, but also has to do with how the various stakeholders and users of different parcels of land relate and interact with each other on the spatial dimension. Expounds on the idea of “Space Syntax” which recognises “the autonomous potential of space to form patterns was, in effect, seen as the means through which it is able to give expression to social meanings” [5], [6], [7]. The analysis of space relations has bearings on the movements and flows of people – those that use the space and pass through it. The land use in area also consists of an interesting variety. The colonial buildings and the museums, residential areas and the Fort Canning, local small scale shop houses found in the narrower streets, commercial buildings with shops and offices, educational institutions, and a great variety of
eating places (which are very important social places in Singapore). The variety of attractions generate movements – walking can be done to and fro buildings and in smaller street, while vehicular traffic uses the roads to enter or pass through the area. The idea of co-presence “We find in effect a basic partition of the city into a dual pattern, the one created by and responding to micro-economic forces, the other, the residential part, responding to cultural forces, the one more integrated the other more segregated.” The study of Yang and Putra (undated) [9] noted the importance of the Bras Basah Park in maintaining “the quality of openness and visual connection” between its surrounding uses. There s also the concern of generating urban activities and promoting stronger interactions between stakeholders in the area, which includes students, local residents, business people and tourists. On a more macro scale, architect Tay Kheng Soon illustrates a mental map to show how the Bras Basah District is functionally and geographically a connector with four important “petals”, or distinctive areas, in the central region (Figure 3) [10].

![Mental map of Architect Tay Kheng Soon, describing how the Bras Basah District (the white oval) connects four important areas of the central region of Singapore (not to scale) [10].](image1)

**Figure 3.** Mental map of Architect Tay Kheng Soon, describing how the Bras Basah District (the white oval) connects four important areas of the central region of Singapore (not to scale) [10].

![Included in the design guidelines, this sight-line must be preserved to maintain the vista of the Fort Canning Hill (dotted shading) from the Bras Basah Park (not to scale) (gray shading in the arrow line). [2], [4]](image2)

**Figure 4.** Included in the design guidelines, this sight-line must be preserved to maintain the vista of the Fort Canning Hill (dotted shading) from the Bras Basah Park (not to scale) (gray shading in the arrow line). [2], [4]

In the approved plan (Figure 4), it can be seen that the Bras Basah Park has been reduced in size, although a narrow line of view to the Fort Canning Hill has been maintained. The below study further elaborates the visual impacts of a number of alternative plans [9].

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Map with Point of Observation, numbered 1 to 10 along Bras Basah Road, looking from the road towards Fort Canning Hill. This is to establish and compare the extent of vista based on different proposals on the physical locations of the new buildings (Figure 5).

Figure 6. Map with block and point of observation [9]

Figure 6 show four separate proposals. The building outlines show how the various buildings of the new campus will be located. A View shed Area Comparison was made and the results are as follows.

Figure 7. Result of view shed area comparison [9].
In the View shed Area Comparison, it can be seen that if “no action” was taken, that is, no plan was implemented, the open space visual quality is the highest at all ten observation points. Proposal C on Figure 7. Result of View shed Area Comparison seem to yield comparatively good result for keep the visual quality, but the buildings of the campus would have to be quite “scattered”.

4. Conclusion
This case may represent how in the case of a multi-criteria evaluation, the urban design and cultural heritage principles can come into conflicts with the more practical concerns of space constraints and efficiency in transportation. This has been a consistent issue in Singapore which is very land scarce, but it also reflects the problem with many fast developing countries that have to decide between conservation of buildings and green spaces and space demands. In terms of the final results of the plan, though it did not manage to save the Old National Library and keep the Bras Basah park intact, it nevertheless had gone through some modifications to keep a fair level of urban visual quality. Yet in this case, for Singapore, it marks a progress in the step of greater community involvement in the planning process, where not just lay citizens voice their views and opinions, but also where “skilled citizens”, meaning architects and planners, in their private capacities, draw up alternative proposals that could perhaps better represent the of local communities of their aspirations for the shaping of the spaces and places that they inhabit.

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