Site Selection Procedures for Campus Facilities

Introduction

One of the most difficult tasks for campus planners is making site selection recommendations based on qualitative facts which often cannot be compared directly to each other. Any means of alternative site evaluation must include, as part of an overall decision-making process, a flexible system of comparing such far ranging criteria as visual impact, access to parking, site development cost, etc. The methodology described here, though based on a simple model of matrix evaluation, incorporates a system of applying weights which is both easily managed and defendable.

Site Selection Methodology

The process can be described as having two distinct components. The first deals primarily with the development of selection criteria which serve as the basis for a comparative evaluation. The second part involves the organization of a weighted scale and a quantitative evaluation of each site.

Process Summary

Step 1: Selection Criteria
- Clarify programmed site requirements
- Establish selection criteria
- Develop intuitive weights

Step 2: Intuitive Evaluation
- Evaluate how well each site meets each of the selection criteria
- Generate a preliminary / intuitive site ranking

Step 3: Comparative Evaluation
- Clarify the importance of each criterion compared to the other criteria
- Develop comparative scores

Step 4: Calculations
- Calculate the weighted score and formal weight for each criterion
- Calculate total scores for the sites and generate a final site ranking

Step 5: Recommendations
- Based on this exercise, make a site recommendation to the administration
Process Details

Step 1: Selection Criteria

This step involves a discussion with the client department and other potential users of the facility to identify the relationships between the proposed building and its site as described in the building program. While the most obvious is the amount of space required for construction of the facility, the list of possible factors used in the evaluation of alternative sites is potentially inexhaustible and depends on the scope and sensitivity of the project. Care should be taken to list all possible factors, even if they are not used in the final analysis.

Many criteria are unique to the particular facility, while others are more generic in nature. In addition, criteria may be categorized as either exclusion criteria (e.g., areas with existing structures, master plan conflicts, seismic, flood, soil, or other natural risk areas, etc.) or selection criteria (e.g., vehicular access to and from the facility, possibility for future expansion, proximity to related facilities, master plan congruence, visual impact, parking, impacts on surrounding community, etc.) describing desired characteristics of an ideal site.

Phrase each of the "selection criteria" as a detailed statement which can be maximized. For example, instead of simply trying to evaluate "impact on surrounding community," the criterion could be rephrased as "the proposed site will minimize the impact of generated traffic and noise on the surrounding campus and residential community areas." It is important to use as much detail as possible, so that it is clear exactly what factor is being evaluated.

In some cases, factors which may be quantified. If a certain amount of adjacent parking, for example, is absolutely necessary for the proper function of the facility, the "parking" selection criterion would be phrased as "the proposed site must be large enough to accommodate 25 parking spaces immediately adjacent to the new facility." Such criteria may be used to further eliminate sites that do not meet the quantitative requirements.

It is very important to have the right people involved in this process. Potential users of the facility in conjunction with university staff & administrators should be involved either as active participants or as reviewers at various stages throughout the site selection process.

Factors that might be exclusive in nature, such as the existence of seismic risk, are occasionally used as selection criteria. (e.g., What degree of seismic risk exists?) While either use may be acceptable, depending on the nature of the project, each factor should be used only once, as either an exclusion criterion or a selection criterion.

Costs associated with site development should not be used as selection criteria.

The advantages of this effort are twofold. Going through this process gives everyone involved a better understanding of what is best for the project. It also produces a documented process that is transparent to others that were not involved.
Depending on the scope of the project, it is usually desirable to add a conceptual layout for each site (showing how the building might be placed on the site, including access roads, parking, and landscaping) and a cost estimate for required site development and improvements. Cost estimates for site development should be developed uniformly for each site and should include site specific modifications such as grading, excavation, landscaping, soil retention, replacement of existing structures, utility extensions, etc.). Site development costs should not be used as selection criteria, but rather as an administrative tool to compare apparent benefit with cost.

Each factor is evaluated independent of the other factors and assigned a preliminary weight between 1 and 10, with 10 being the "score" for a factor(s) which can be termed as having indispensable importance to the final site selection. These "weights" are determined through discussion and intuition then applied to each selection criterion to indicate and emphasize their relative importance. This makes it possible to quantifying the evaluation process.

Step 2: Intuitive Evaluation

Preliminary sites are to be those identified in the Campus Master Plan. Inclusion of a site not identified is at the discretion of the Associate Vice President for Facilities Management. Subjective elimination or inclusion of any sites prior to some type of formal evaluation invalidates the entire process.

The most obvious method for prioritizing and ranking each site is to simply ask how well each site meets each of the selection criteria developed. A simple matrix, which lists the proposed sites on one axis and the selection criteria on the other, is the perfect tool for this. Each site is carefully evaluated as to how well it meets the requirements of each selection criterion.

The symbols +, -, or = are placed in each cell of the matrix to identify how well each factor is met. For example, if Site A meets the requirement of the first selection criterion very well, this fact would be documented with a + symbol. If Site B only does a fair job of meeting requirement number one, it would be noted with an = symbol. Should Site C not accommodate criterion one at all, this would be noted with a - symbol.

When the matrix is complete, it is possible to visually evaluate which sites appear to best meet the requirements of each criterion and the selection criteria overall.

Step 3: Comparative Evaluation

Each factor is then compared to each of the other factors in binary fashion. As each pair of factors is evaluated, the factor which can be considered more important is noted along with a notation indicating how much of a difference there is between the preferred factor over the secondary factor. When all factors have been compared, the total number of times a factor was
identified as the more important factor multiplied by the difference in importance (Small=1, Moderate=2, Large=3) generates a list of “comparative scores” for each criterion.

**Step 4: Calculations**

To generate weighted scores, each intuitive weight is multiplied by the total comparative score previously calculated. The use of the comparative score to determine weights dramatically expands the range of weight values and emphasizes the difference in relative importance between each of the selection criteria.

The formal weights, which will be used as a multiplier in the final evaluation matrix, are calculated by dividing each weighted score by the total of all weighted scores. The total of all final weights will equal 100. The composite score is the formal weight multiplied by the score generated by the intuitive evaluations in Step 2.

The total score for each site is calculated by adding the composite scores for all criteria. When all of the total site scores have been calculated, the sites can then be placed in a formal rank order based on the program needs of the proposed building.

**Step 5: Recommendations**

Based on this exercise, a well informed site recommendation can be made to the administration. Documents presented as part of a final report should include all drawings, cost estimates, matrices, and supporting data.

*The final site decision is made by Senior Administration after careful comparison of costs and benefits (both economic and qualitative).*