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ABSTRACT

This review surveys literature previously announced in RIE and CIJE pertaining to site selection for elementary and secondary schools. Many of the documents cited identify typical site standards and discuss their relationship to site selection techniques. Other documents describe methods for predicting land costs, establishing attendance areas, and integrating school locations with city planning. The literature stresses the need for coordinating information at all decisionmaking levels for facilities planning as well as site selection; and observes that, as placement and use of new schools become increasingly matters of public discussion, those criteria pertaining to school-community interaction can be expected to figure prominently in the site selection process. (Author)

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Site Selection

Alan M. Baas

Site selection is an educational, technical and aesthetic problem, requiring cooperative efforts and special skills of school administrators, boards of education, architects, engineers, and special consultants. The blending of their insights, efforts and expertise should ultimately result in successful site selection.

Harchbrek (1971)

Selection of school sites is an integral function of the total educational planning process. The actual choice of a school location is usually the result of a combination of foresight, intuition, luck, and the rational application of site standards. Because the characteristics of each community are unique, there are no fixed guidelines for use in the selection process. There are, however, numerous general standards from which planners can select criteria suitable to the program of the proposed facility and to the community's educational goals.

The planning team must take into account the many variables related to school programs, building design, site development, city planning, and neighborhood sentiment. Information gathered during the actual site search should be used to reevaluate initial building designs and site criteria. It may be that the site limitations of available locations will require special building solutions or a curtailment of some aspects of the proposed school program. Planners must therefore be aware of recent developments in building utilization and design such as compact schools, shared facilities, and use of air rights over public lands.

Recent literature on site selection stresses the need for coordinating information among the different levels of decision-making in both facilities planning and site selection. As the placement and use of new schools increasingly becomes a matter of public discussion, those criteria pertaining to school-community interaction can be expected to figure prominently in the site selection process. Many of the documents surveyed in this review identify typical site standards for elementary and secondary schools and discuss their relationship to selection techniques. Others describe methods for predicting land costs, establishing attendance areas, and integrating school locations with city planning.

Nine of the documents are available from the ERIC Document Reproduction Service. Complete instructions for ordering appear at the end of the review.

FACTORS IN SITE SELECTION

Schneider and Wilsey (1961) describe for school planners a systematic method of identifying and analyzing factors pertinent to site selection. They report on a comprehensive examination of site selection techniques and objectives and identify twenty-five major criteria to be considered when comparing potential sites. These factors, together with related secondary items, are listed on page three of this review.

The authors caution that the relative importance of each site selection factor must be determined by inspection of local conditions in each district and by value judgments made by those involved in the decision-making process.

To ensure comprehensive site analyses and comparisons, they recommend a team approach involving both educational and technical personnel. The educational team, composed of school district administrators and staff members, is responsible for designing the educational objectives and programs of the proposed facility. The technical team, coordinated by the architect and including various engineers, consultants, and members of local and state governments as needed, should have a working knowledge of the community's educational aims. Schneider and Wilsey stress that members of the two teams should be brought into the planning as their particular functions fit into the total picture.

The document contains questions to be asked as part of the selection process and rating sheets for both subjective and objective factors. The rating sheets are designed to provide profiles that identify critical aspects of each site and enable quick comparison of alternative sites. From their study, Schneider and Wilsey conclude that net savings occur when site purchases are made at least two years in advance, with maximum savings resulting when land is purchased three years in advance. They supplement their presentation with examples of aerial photographs, geologic and topographic maps, test borings, and models for use in the site analysis and selection process.

Stanford University ([1968]) offers an abridged version of the Schneider and Wilsey findings, excluding materials on site selection economy and supplemental photographs and maps.

In a recent *CEFP Journal* article, Ringers (1972) discusses site selection fundamentals. To ensure protection of public interests, he recommends that preliminary studies involve many individuals from different segments of the community but final

CRITERIA FOR SELECTING SCHOOL SITES

availability: ownership, future land use

location: attendance zones, enrollment policies, facility size, community growth and land use patterns, natural resources, zoning, commercial-industrial expansion, master plan

environment: obstructions to view and daylighting orientation, proximity to public facilities, possible new development affecting land-use and zoning, sources of noise, atmospheric conditions, weather and climate

accessibility: natural and man-made hazards affecting attendance areas, pupil-travel distances and conditions, traffic flow, public transit, general safety, school transportation services.

size: minimum area, play space, parking, seclusion of classrooms from streets, future expansion effects, possibility of future enlargement

shape: generally with 3 to 5 width to length ratio, educational program, topography

topography: contour maps, drainage, large open areas for play, flood plains, earthquake zones, seasonal effects, tests, and costs of site preparation, development, and maintenance

acquisition: availability, number of owners involved, examination of deeds, methods

cost of land: comparison of initial and ultimate costs, market value, appraised value

soil condition: growing potential, bearing capacity, stability, types of fill existing, recent tests

sub-surface condition: percolation, water table, slide characteristics, evaluation of recent tests

site preparation: earth moving, grading, cost of preparation versus acquisition cost

orientation: climate, solar angles during school hours, prevailing winds, noise and air pollution, controlled environment considerations

expansibility: available land on or adjacent to site, additional preparation needed, estimate of potential need for expansion

flexibility: ease of conversion to changing educational, recreational, and community needs of the district

educational adaptability: natural features that may enhance educational program, ease of conversion to use by different type of school if district needs require

site development: landscaping costs, building arrangement, location, and expansion potential

utilities: availability, rights of way, topographic barriers, cost of service connections

public services: fire and police protection, refuse and garbage disposal, park and recreational facilities, supplies and equipment delivery

community use: proximity of community centers and potential joint-use of facilities

outdoor activities desired: areas for instruction, athletics, recreation, and spectators

undesirable elements: proximity of social hazards such as taverns, "skid rows," etc., and hazardous bulk storage of inflammable or noxious industrial materials

maintenance implications: estimate of potential difficulties due to topography, soil conditions, gardening, etc.

political implications: probable individual, group, or general public reactions to a particular site and resultant forces affecting available choices

master planning factors: inter-relationship of schools to community, coordinated plan acceptable to best interests of school and community, and continuing study of long-range site needs

Schneider and Wilsey (1961)

negotiations be made by as small an executive body as possible. The article explains the major internal and external criteria necessary for a school site study and identifies several methods for utilizing a school site more effectively.

To offset school site limitations, Ringers suggests a variety of intensive and multiuse design solutions. These include use of compact building design, underground schools, air rights over public lands, and structures shared with either public or private organizations. In urban communities where land is scarce and valuable, density credits may be offered developers who wish to develop a certain site intensively, provided they leave other land nearby protected as perpetual open space. This open space may then serve as park and recreation areas.

A guide by Harcharek (1971) explains information necessary to school site selection and presents a model for organizing the selection process. To ensure wise expenditure of funds and educationally desirable results, Harcharek proposes that all school districts have long-range programs for identification and evaluation of potential school sites. In selecting site alternatives, he recommends use of an itemized cost-comparison table including price estimates for the following site preparation tasks:

clearing and grubbing
demolition and removals
earthmoving
rock removal
underdrainage
electrical service
athletic and other facilities
storm drainage
water supply
sewage disposal
walks, drives, and paving
sodding, topsoiling, and planting
fencing, gates, and barriers
transportation cost differences

The total of these costs, together with the acquisition cost, can give a reasonable picture of true site costs and a more rational basis for choice among sites.

The conviction that site development is as important to the educational process as building design underlies Reida's manual on school site selection and development (1966). Therefore, an important factor in site selection should be the capacity for accommodating potential changes in educational programs and facilities. The manual includes explanations of critical site criteria, score sheets for rating proposed sites, and a table of recommended space allocations for physical education and community recreation areas.

Other documents also integrate information on site analysis, selection, and development—State University of New York (n.d.), Taylor (1962), and Bruning (1966).

Not surveyed in this review because of their number and brief treatment of site selection are many comprehensive planning guides compiled by state and private organizations. Such documents may be located in *Research in Education* by searching under the terms Educational Planning and/or Facility Guidelines. One comprehensive planning guide compiled by the Council of Educational Facility Planners and edited by Stewart (1969) is noted here. It is widely used by state and local agencies, and its list of site selection criteria reflects standards recognized across the country.

A *School Management* article by Wilfong, Pettry, and Pa (1972) points out that soil conditions, topography, and ecological concerns may introduce costly requirements in the school building program and should be considered in the original site analysis and selection process. The authors report that advance recognition of special site

limitations permits the design of facilities that will conform with the natural site and avoid excessive development costs. They also note that neglect of ecological considerations may result in damage to the environment and unfavorable public reaction. In addition to making an onsite inspection, those involved in site selection should obtain soils analyses and topographic surveys identifying the steepness of the terrain, the locations of floodplains and drainageways, and the existence of faults, sinkholes, and rockslide areas.

Wakefield (1968) gives an annotated reference list of documents processed by the ERIC Clearinghouse on Educational Facilities. These documents deal wholly or partly with school and facilities location and site selection for all levels of education.

METHODS, MODELS, AND CASE STUDIES

School site selection standards and processes are critically analyzed by Seelig (1972) in the *Journal of the American Institute of Planners*. He suggests ways of increasing planners' effectiveness and discusses functions and operational definitions of site selection standards.

His examination of a school site location program in Philadelphia's inner city reveals that by originally specifying standards that were too vague, planners damaged their own credibility as effective problem-solvers. In the case studied, the original standards proved to have no bearing on the final selection of a site. Instead, as various types of community and business opposition were encountered, the major objective became selection of a site that would generate little or no opposition.

Seelig observes that lack of coordination among school districts and failure to review educational programs relative to land limitations cause inflexible standards that reduce

PROCEDURES FOR REVIEWING SITE SELECTION STANDARDS

The selection process should start at the time the school program is being established. It is more efficient to abandon the functional separation between "facility planners" and "program planners," and to encourage a working relationship between them.

Because goal statements are value statements, they should represent as large and varied a segment of the population as possible. Preliminary standards are means for achieving stated goals, but these standards should be reevaluated at later stages.

Using the standards as a yardstick, those involved in site selection must initiate a search for feasible sites. Several options should be located pending reevaluation of standards and requirements as more information is obtained during the search.

Sites should be examined in the light of possible community opposition and of any other information that may adversely affect the choice of a particular location. The composition of the neighborhood, variation in land costs, or need for additional accessibility provisions may force the development of a new set of standards.

Using his knowledge of the alternative sites available, the planner must compare the sites on the basis of complete sets of standards rather than on the basis of individual standards. The final decision must evolve through a qualitative evaluation based on the skill and personal values of the planner and of the citizens involved during the process.

drawn from Seelig (1972)

the effectiveness of the selection process. Use of standards is complicated by the fact that most site criteria originate from the 1950s suburban school boom and have not been adjusted to match inner-city needs. Further, there is too much variation among standards from different sources. Techniques are needed for coordinating information among the different levels of decision-making in both facilities planning and site selection.

In conclusion, Seelig advocates an approach to the use of site standards that would reevaluate initial program objectives and design requirements against actual site alternatives as they are located. His recommended procedures for reviewing site selection standards are summarized in the box on page five of this review.

Recognizing that educational policy is "inextricably linked with the aspirations of the city as a whole," O'Brien and Lyle (1968) propose an urban education model for use in planning the site location and enrollment size of urban schools. Their analytic and symbolic model consists of four submodels for determining attendance area boundaries, space and staff requirements, costs, and achievement levels.

Dost (1968) examines the school facility as multifunctional within a broad socioeconomic framework and recommends that school site decisions be integrated with the more general problem of urban planning. Broadening the production capacity of an educational plant through uses and services other than educational can increase the potential rate of return on the school investment and give the facility a more meaningful place in urban community life. Potential future benefits and costs should figure in all comparative analyses of site locations.

In an earlier paper, Dost (1967) presents two models for selecting area school sites to minimize time and costs of transporting students. The first model deals with the relationship of school site and bus transport problems. The second model provides a solution for the commuter postsecondary educational institution. She reports that the economic efficiency of any potential school location will be dependent on spatial distribution of students, geographical terrain, urban-rural characteristics, and roadway networks.

An operations research model for locating area vocational schools is described by Uxer (1967). The major characteristics of this model are potential enrollment, job opportunities for graduates, and financial support. The model was applied to two communities in New Mexico to predict if the communities could successfully support an area vocational school. When the model was applied to a sample of existing schools, the results coincided with classifications made by the author and by state vocational directors in 86 percent of the instances. Uxer observes that such models can be used by educators as analogues representing processes or systems under study.

Accurate prediction of land acquisition costs is the subject of a report by Garrigan (1967). He presents a cost formula based on four variables: assessed land value, assessed value of improvements, area in square feet, and a time factor. Application of this formula to thirty-three parcels of land purchased during 1966 indicated a variation of 2 percent between predicted costs and actual prices paid.

Tokmakian (1969) reports on a school site selection project in Fresno, California. In addition to an analysis of school site criteria, his report identifies principles and standards of community planning and

school location. To meet school needs through 1985, the project makes recommendations for number and location of school sites.

To gather the documents used in this review, *Research in Education* and *Current Index to Journals in Education* monthly catalogs were searched from January 1968 through March 1973, using as search terms these descriptors: Land Use, School Zoning, and Site Selection.

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For each order, indicate the ED numbers of the desired publications, the type of reproduction desired (paper or microfiche), and the number of copies being ordered.

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