LONG RANGE CAMPUS PLANNING, THE UNIVERSITY OF NEW MEXICO'S NORTH CAMPUS

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"It is a truism that a university is a society founded for the advancement of learning and the dissemination of knowledge. This means that it is constantly changing, always on its way, its work never completed. Departments expand, contract, quadruple in size, or vitually disappear within a few years, often in defiance of the most knowledgeable and expert forecasts. Every building and each layout so optimistically and thoroughly designed seems to become within a decade not only out of date but physically hampering to the future. Any attempt therefore, to construct its movement artificially, either academically or physically, seems doomed, and rightly doomed, to failure."—Casson and Conder, University of Birmingham Development Report (1958).

Historically, campus planning has consisted of arranging building shapes into a series of pleasing exterior spaces. The size and number of buildings were based on future predicted enrollments, class sizes, curricula, and teaching methods. The form was left to the discretion of the planner. In the United States, buildings were often grouped in a symmetrical manner, forming major and minor axes, creating great malls and vistas which were terminated by a library to indicate its major role in education and planning. These campuses were academic islands, rural in character, insulated, and uninvolved with the surrounding community.

The prototype of such planning appears to be Thomas Jefferson's master plan for the University of Virginia in 1825 which served as a model for several nineteenth century campus master plans in the United States. As one reviews these proposed plans in reference to the same campuses today, he soon realizes that the degree to which it was possible to follow a plan is directly related to the element of time: the viability of the plan is not a matter of practicality or aesthetic worth. When the proposed structures were built within a few years, the plan was adhered to, but as the time lag in construction increased, the plan became more difficult to follow. This short life span of a viable scheme is the problem that any master planner today must face.

Planners who try to control every building form and every space between buildings, or who attempt to predict future building requirements and sizes, should realize that their visual solutions will have little reality in a short period of time. Planning in this manner can only fail to meet the educational and practical demands of today's growing multi-university.

Today's planning must be viewed as moving toward goals rather than as establishing a vision of an ideal state. The planner's function is to collect data, analyze information, and point out directions and alternatives to assist the decision-making process. In this way principles can be formulated which will act as a guide in creating an environment for human life whose characteristics and aims are always changing. The challenge can only be met through a pragmatic planning process. As H. J. Blackham says in *Political Discipline in a Free Society*, "The plan initiates a course of action which produces events experienced by the agent, in the light of which he modifies the plan; so that, in a sequence of phases, the plan is continuously initiating action or being modified by the results of action; . . . . (a continuous adjustment on the feed-back principle), but also a modification of the end in view, a revision of intention, a recasting of desires, a development in understanding."

This process has been adopted for the development of the University of New Mexico's North Campus Master Plan. It entails a systematic method for the collection, analysis, synthesis, and evaluation of data. The approach is derived from a series of recently published books and articles which are concerned with problem-solving methods borrowed from computer techniques and management theory as a basic tool for the assessment of design problems and the development of design solutions. (See list at end of article.)

The Planning Method

The difficulty in arriving at any solution is one of clearly defining the problem. Knowing what questions to ask and recognizing which areas demand further investigation is of paramount importance. The following outline indicates the steps followed in organizing and evaluating the basic problem and the various sub-problems. It indicates also how these

steps interlock and how each subsequent decision is dependent on a series of other decisions.

Step 1.

Analyze the campus by subdividing the problem into a series of systems. This is somewhat arbitrary, but it includes the areas necessary for thorough investigation of campus problems. The series are:

a. *Educational system.* This includes student education by professor, students, and machines — both individually and in groups.

b. *Research system.* This is the researcher's quest for knowledge through people, animals, books, and machines.

c. *Social system.* This is the concern for private and public space that will generate social intercourse.

d. *Circulation system.* This is the requirement for pedestrian and vehicular connections between spaces.

e. *Service system.* This requirement provides for utilities, supplies, and maintenance services between spaces.

f. *Political system.* This is a knowledge of the decision-makers so that planning can be accomplished.

g. *Economic system.* This involves sources of income from foundations, state and federal agencies in order to relate cost to income.

h. *Physical system.* This is a study of all existing conditions within the site, and surrounding the site, that affect the planned area, (i.e. utility services, bus routes, street patterns, etc.).

Step 2.

Collect the data. Pertinent information must be gathered for each system. Several methods have been developed to do this. J. Christopher Jones, a recognized authority on systems analysis, in the article entitled *A Method of Systemic Design,* states that a meeting should be held with people involved. Each person should write a list of all thoughts that occur to him on acquaintance with the problem. Each person reads out his list of factors. This list should be extended until it includes every single factor which can be thought to influence the design. When the list becomes too disorderly, a classification chart can be developed for each system.

In the case of the North Campus we made an effort to record all meetings, list all facts pertaining to the problem area, record all decisions, and list the stated user-requirements as suggested by the people involved. We also have developed a list of questions and ideas which begins to challenge present thinking. In this way investigation of still other means of resolving the problems can be initiated. As information is gathered, it is classified, color-coded, indexed, and filed on 3 x 5 inch cards.

Step 3.

Establish goals for each system. This begins to focus the requirements and it assists in establishing guide lines for further investigation and research. As an example, the Goal Statement for an Education System was: "Medical schools should broaden their horizons. There should be a reduction of hard, fast scheduling, and major stress should be in the direction of community needs and community medicine." —Dr. C. H. W. Ruhe of the A. M. A.'s Council on Medical Education.

Step 4.

Establish the crucial issues. This, too, is a focusing device that directs additional investigation to the crucial areas. In no way is it possible to study every aspect of the subjects involved.

Step 5.

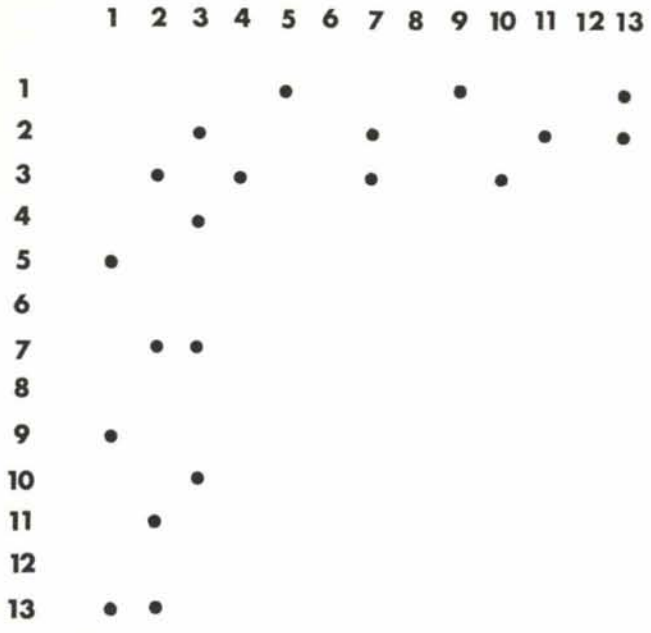
Establish the planning requirements. By reviewing all data collected, a list of requirements can be compiled for each system that has decision-making implications which will effect the master plan. Fortunately, many requirements can be met which have no affect on the plan, but until one realizes this fact these demands have a tendency to interfere with the planning process. They act like static; they seem to sidetrack the solution and confuse the basic issues to be resolved. Every effort must be made to sort out or uncouple these requirements and to deal only with basic requirements which, along with their interactions, are the real generators of the sub-problems to be resolved.

Step 6.

Identifying the problems. Through a process of personal experience and mental feed-back (review, analysis, re-evaluation, and a continuous alternation of focus), of zooming in and out looking first at the big picture and then at the detail, of moving back and forth, basic problems can be identified. This process is primarily intuitive and can be applied to less complicated planning problems. As these complications and, therefore, the resultant actions and reactions increase, a more statistical listing of requirements becomes necessary. In order to analyze their inter-actions each requirement must be reviewed in reference to every other requirement. As an example: see Sketch, page 19.

By studying this matrix we can identify certain linkages which indicate sub-problem areas that require major design considerations since requirements are interlocked in these areas and must be reconciled. In addition, one can mathematically study problem areas by investigating the percentage of interactions.

Another method of identifying these problems has been explored by the young architect-mathematician, Christopher Alexander. Here the requirements and interactions are programmed on a computer. The interactions are analyzed to the 1st, 2nd, 3rd degree, etc. The computer prints out and identifies the sub-problems mathematically. Alexander refers to this as the "decomposition." This method divides the problem into set and sub-sets, and it establishes a



By studing this matrix we can identify certain linkages

hierarchy of problems that must be solved in a vertical order.

Step 7.

Analyze the sub-problems. List the requirements which are in each sub-set and write its performance specifications. The design solution most occur within these constraints. Because no complex solution can satisfy all requirements 100 percent, certain reasonable limits will have to be established; the solution must occur within this reasonable range. Similarly, since each requirement can only be fulfilled to a certain degree, there is no one solution. Thus different combinations have been evaluated. To resolve any problem, decisions have to be made as to which requirements need the greatest degree of fulfillment. By this method a more intelligent basis on which to make decisions is established. Either these solutions can be described verbally or diagrammed graphically.

The information so far accumulated is often referred to as "the brief." It should continually be updated by the planner through review, decision-making and evaluation of performance.

It is our hope that eventually all of the information gathered in our investigation of North Campus requirements can be programmed on a computer and stored. New information can be fed into the computer at any time which will permit an immediate evaluation of new ideas or new requirements or gage their effects on the many sub-problems.

When one realizes that there are thousands of requirements which must be met in planning a campus and that they all inter-lock in one way or another, it becomes clear that experience and intuition are no longer sufficient tools with which to reconcile planning problems. Although a systematic method of analysis will not in itself design a campus, it can be an aid to a clearer understanding as to what criteria must be met if the design is to be valid.

The North Campus Plan

The first stages of investigation into the problems of planning the North Campus indicate a number of emerging concepts which will radically affect the planning form:

1. There is a strong indication that what connects the buildings is far more important than the buildings themselves. Utilities (plumbing, heating, cooling, and electricity) and circulation (pedestrian as well as vehicular) are the only architectural elements which can be predicted with some degree of permanence. The implication is that the connecting element might become the controlling factor within the hierarchy of visual forms that will constitute the campus. It is also clear that the social system, both private and public, will change very little over time, and its physical needs can perfectly well be met in the connectors (i.e., the connecting concourse).

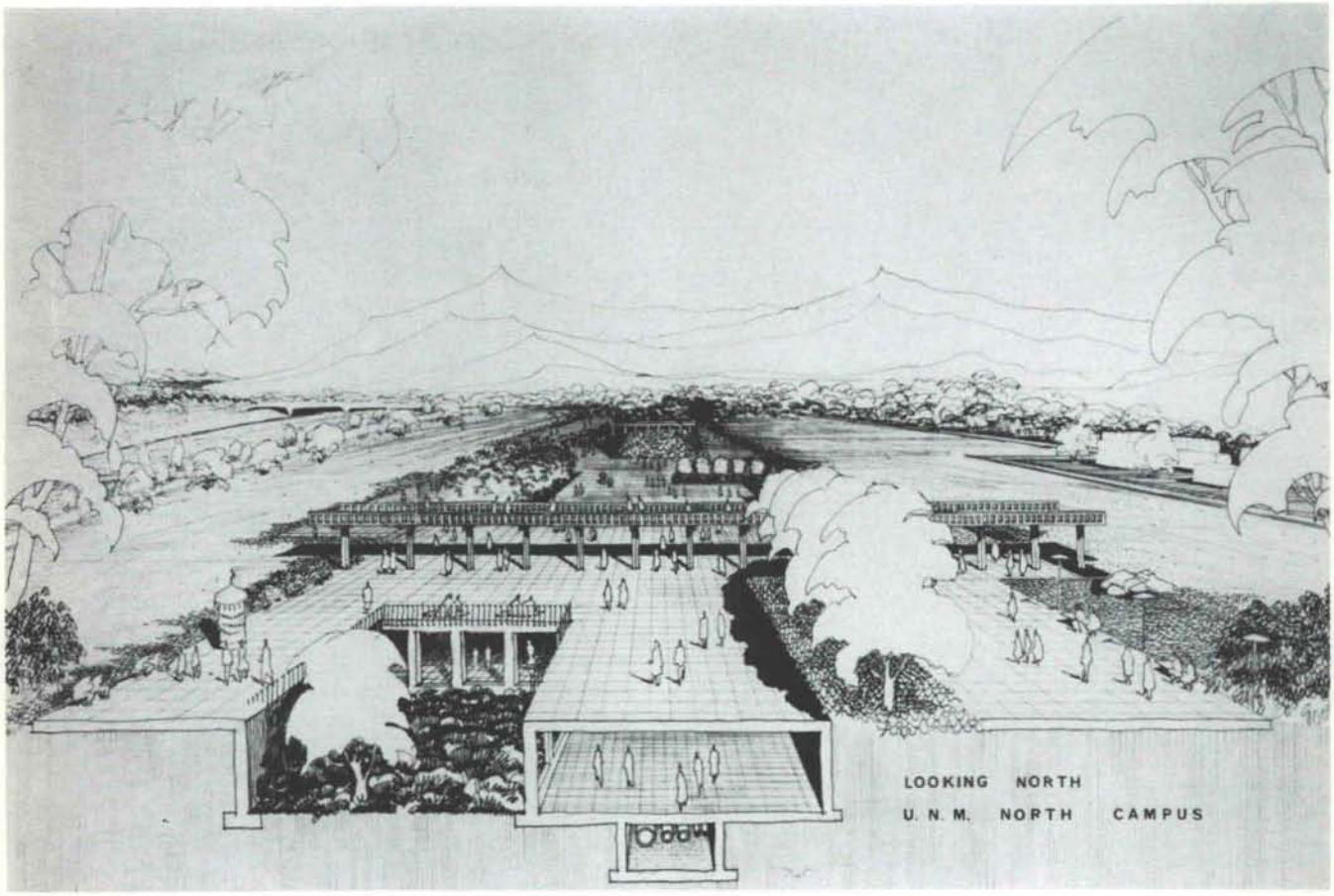
2. The building forms themselves are the most unpredictable quantity in the study and any statement in the plan of the North Campus on their location, shape, or size becomes an educated guess which could well produce more problems than it would resolve. Any effort to suggest them at this time, therefore, has been avoided. It appears that the buildings might be the least expression in the overall campus form. They could even be prefabricated, mountable, and demountable to provide unassigned spaces which could be used in any way the University saw fit when the need arose.

The analysis also indicates another area to be investigated which might provide for the building needs. There appears to be a series of inherent closed spaces or "spare blocks" which could accommodate the various functional requirements. Present studies indicate that as few as four or five such space blocks, each serving three or four different functions, would accommodate the demands of any campus. Since these space units seem to arrange themselves in clusters both horizontally and vertically it appears possible to develop a structural and mechanical system which would resolve the design of the spatial units.

3. That a campus can not be an island, a city within a city and separated by hard edges which isolate it from the larger community, is clear. The University of New Mexico will continue to play an increasingly important role within the city and state. As the University becomes a more dynamic part of

the community its hard edge boundaries will disappear. The same can be said of the structures which divide the University into departments and colleges with inwardly oriented curricula. Instead of focusing in a centripetal manner, it will begin to orient itself centrifugally.

a protected circulation between buildings. At grade is a pedestrian street, a great urban space which will generate activity sixteen hours a day. This forms the spine of the plan. The long range plan preserves this connector, zoning it so that no future building can obstruct it. The master plan indicates no loca-



A nexus of connectors has been developed which will provide a utility tunnel, a pedestrian concourse and a great urban space.

4. It also appears that the University will concentrate more and more on the process of education. The whole question of involvement with other areas of service (housing, food service, housekeeping, and maintenance) should be investigated. The University might lease land to private enterprise which, in turn, would provide housing and other social services. Other leases might include foundation sponsored research, or federal, state and county facilities which are university oriented.

Our studies for the North Campus are in a very elementary stage, but certain concepts for the long range plan have been established. A nexus of connectors has been developed which will provide a utility tunnel. Above this at a second level but still below grade is a pedestrian concourse which might provide all the social service for the campus as well as

tion for specific buildings because planners today can only vaguely envisage what the future building requirements will be. As building needs develop, the new structures to house them will be plugged into the connector. Exactly how this will be accomplished will depend upon the architect commissioned to design the building. The success of this type of planning will depend on how well the planner and each architect are able to act and react to the existing forms and conditions.

Landscape architects, interior designers, and artists will fill in the details and provide the necessary color for a complete environment. The long range plan provides the framework within which this can happen. In reality, the future master plan may not be a plan as we have known it in the past, but rather a body of collected information and analysis which

has been placed on data cards and stored in a computer bank, of diagrams establishing connectors and circulation patterns, and of written specifications regarding space, similar to a zoning ordinance.

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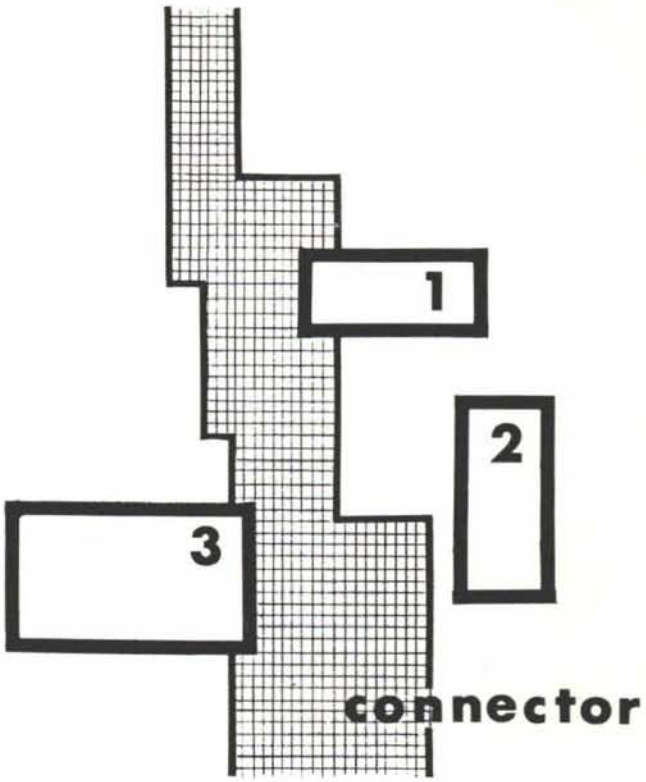

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