THE UNIVERSITY OF OREGON MASTER PLAN

CENTER FOR ENVIRONMENTAL STRUCTURE

DRAFT AUGUST 1971

INTRODUCTION

In late 1970, we were asked to prepare a master plan for the University of Oregon. For the reasons given in Chapter 1, we decided from the outset, that the conventional master plan was unsuitable, and that we would try to create an entirely new theoretical framework to replace it. Since the task of working out a new framework far exceeded the available funds, we decided to bring our research, sponsored by the National Institute of Mental Health, to bear on the theoretical aspects of this problem, with the idea that the actual specifics worked out for the University of Oregon, would not only help the University itself, but would also serve, for more general readers, as an example of the concrete effects created by these theoretical ideas.

As a result, the book has two halves. Part 1 deals with theory; Part 2 deals with practice. In Part 1 we outline the theoretical ideas which we consider essential to the planning process. This part may be treated as a theory which replaces the current theory of master plans. In Part 2, we apply this theory to the University of Oregon, by constructing a full scale master plan, according to the tenets of the theory, for the University.

This is the second draft of the plan. In this draft, Chapters 1-6, dealing with theory, are more or less complete, Chapters 3, 4, and 5, perhaps the most important chapters, have been entirely re-written, to cover the objections raised earlier by Mr. Hunderup, Dr. Lassal, and the Campus Planning Committee. Chapter 7, contains the patterns, is also more or less complete, though certain other patterns have yet to be added. Chapter 8, the diagnosis, is still very rudimentary, and needs a great deal more work, both from the University Planning Office, and from ourselves. Chapter 9 is hardly started yet. We have included a sample project, for the College of Education, to give the reader an idea of what a "project" will be like. The finished chapter will contain a large number of these sample projects, so that the reader will be able to see not only what the individual projects are like, but will also be able to imagine what the University of Oregon would be like, as a whole, after twenty years of such a process.

August 1971

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CHAPTER ONE: THE FUNCTION OF A MASTER PLAN

Planning is concerned with "wholes". The fundamental problem of planning is: <u>How can we coordinate a large number of separate design acts, carried out by hundreds of different people, over a period of many years, in such a way that they create a living and coherent whole with balanced relationships among its parts</u>?

To understand this problem fully, it will be halpful to have an example. Consider the University of Cambridge. One of the most beautiful features of this university, is the way that the great colleges, St. Johns, Trinity, Trinity Hall, Clare, Kings, Peterhouse, Queens, lie between the main street of the town, and the river. Each college is a system of residential courts, its entrance on the street, reaching down to the river; each one opens onto the river, with a small bridge that crosses the river, and leads to the meadows beyond; each one has its own boathouse; its own walks along the river. While the system is repeated by each college, and each college has its own unique character, the overall organization of all the colleges together, is perhaps the most wonderful thing about Cambridge. It is a perfect example of global order.

At each level, there is a perfect balance and harmony of parts. Where did this order come from? Of course it was not planned; there was no master plan. And yet, the regularity, the order, is far too profound to have happened purely by chance. Somehow, the combination of tacit, culture-defined agreements, and traditional approaches to well-known recurrent problems, made sure that even when people were working separately, they were still working together too - and as a result, no matter how unique and individual all the pieces were, there was always order in the whole.

Today, this is a lost art. Traditions have vanished; problems change fast; cultural agreements are so far reduced, that when individuals work on individual projects, piecemeal, it produces chaos. Slowly, the piecemeal acts of individuals, acting in their own best interests, have created worse and worse environments - the individual acts of building no longer create global order together. In desperation, people who are concerned with the environment have come to believe that the environment must be planned, so as to bring in that global order which came into being so naturally in earlier times. The plan, then, is a modern way of achieving the result which seemed to happen almost willy-nilly in history.

We believe today, that in a university without a plan, the gradual accumulation of piecemeal acts, will create a thousand mistakes of organization, twisted relationships between functions which ought to be related, and missed opportunities.

Without a plan, what guarantees that the road system which emerges will be simple and easy to follow? How can we be sure that the distribution of parking meets needs? How can we be sure that a hastily built building doesn't occupy the very piece of land which would have been ideal for an extension of the athletics complex? How can we be sure that the river front and all its beauty will not gradually be destroyed by a random aggregation of unrelated buildings? How can we hope to meet the need for married student housing, without a plan which tells us how much is needed, and where to put it? How can we be sure that as departments grow, they will force the creation of a random distribution of department extensions, instead of an orderly system of departments which are related by common interest and function?

In short: Piecemeal growth can easily create a loss of coordination among the parts, and chaos in the whole. During the last two decades, people have tried to solve this problem by creating a so-called "master plan". Essentially a master plan is a map. It is a map which portrays the university as it "ought" to be, at some fairly distant future time - say twenty years from now. Since this map of the future represents the university as a whole, it is easy to make sure that, in this map, housing, teaching, roads, parking, open space, are all related in a coherent manner. The map contains two kinds of elements - those which exist already, and should, according to the planners, stay where they are; and those which do not now exist, and which are yet to be built.

Implementing such a plan, at least according to theory, is simply a matter of filling in the blanks in the existing university, according to the land uses, prescribed on the map. If the process is carried out faithfully, then the plan of the real university will, after a certain number of years, correspond to the ideal map of the master plan, and the various parts of the university, as it then is, will form a coherent whole, because they are simply plugged into the slots of the design.

This is a solution of a sort, to the problem of coordination. But it is a solution which must be bought at a massive price. For such a master plan has vicious side effects.

1. The existence of a master plan alienates the people who live and work in the environment which that master plan is intended to control. The existence of a master plan for a community means, by definition, that the members of that community can have

little impact on the future shape of their environment, simply because most of the important decisions have already been made. In a sense, these people are living in a frozen future, able to affect only relatively trivial details. When people lose the sense of responsibility for the environment they live in, and realise that they are merely cogs in someone elses machine, how can they feel any sense of identification with the community, or any sense of purpose there?

2. Neither the public, nor the key decision makers, can really visualize the results of the master plan - so that the form of master plan which is adopted by a community rarely reflects any profound understanding of its human consequences, nor any deep insight into the criteria which make the difference between an environment which works and one which doesn't. A master plan was recently adopted by the town of Gotheborg, Sweden. After its adoption, sociologists interviewed the various legislators who had voted for it. It turned out that most of these men simply did not understand the plan - in some cases they could not even read the map of the plan correctly. A plan adopted under these conditions is hardly likely to meet peoples needs.

It might be argued that these are necessary evils - because it is so overwhelmingly important to create order in the environment, and because the slow accumulation of piecemeal projects, without a plan, is certain to create chaos which is good for no-one. And indeed, it certainly is true that the problem of creating global order does need to be solved. <u>But the fact is that the concept of the master plan, after making all these sacrifices in order to create overall global order, does not even succeed in this</u>. Master plans not only damage people and society, but do not even work.

Let us now try to understand this second kind of failure. In its usual conception, the framework of the master plan is seen as fixed, and unchanging, and the process of development is merely a matter of filling in this framework, as the years go by. In effect, the master plan is a design for the future: and attempts to fix, today, what the environment shall be like twenty years from now, coupled with a policy which then tries to steer the present piecemeal process of development towards that twenty year off image of a perfect university. It is helpful to realize that this kind of master plan is very much like a page in a children's coloring book, where an outline figure is drawn for the child, and the child then colors in the various parts with his crayons, according to the numbers written there.

Of course, any one who knows anything about art, realizes that the kind of painting which this process creates is banal, and lifeless - that, in short, it is not a good way to make a painting. Why? In a painting that has life, each color, and each line, appears on the paper as a reaction to what is already there; each part is responsive to all the other parts. It is this which ensures that every part of the painting is coherent with respect to the whole. The pre-cooked outline, cannot create an organic painting, because, since it is worked out in advance, it imposes a totalitarian order on the various parts. Instead of each part being shaped and colored, to bring it into harmony with the rest of the painting, it is calculated ahead of time, and must, inevitably, end up out of harmony, and badly related to the parts around it, so that the end result is a collection of colored fragments, without unity.

Exactly the same happens in a master plan, and for the same reasons. As the pieces of the plan get filled in, they have no relationship to one another; they are incapable of responding to the accidents of time; each one gets dropped into position, without regard for the whole which already exists, and without relation to it. In the case of a master plan, of course, people can never tolerate its fragmenting irresponsiveness for very long. Gradually the plan gets to be less and less like the reality which actually comes into being, so that people have to ignore it, because it no longer tells them anything useful. In the end everything about the plan becomes useless - because each part hinges on the "total" conception, and cannot adapt to the departures from the plan which have happened in real life.

We see then, that the idea of a "master Plan" not only damages the community in which it acts; it does not even solve the fundamental problem of coordination and global order which it sets out to solve.

In the next few chapters we shall outline an entirely different approach to the same problem. We start with the people who are to live and work in the community - the users. We show that it is possible to define a planning process which they control; and which is firmly grounded in a precise and objective approach to the human needs which they experience every day. And we show then, that it is possible to create global order and coordination among the parts, in a far more organic and flexible way than any traditional master plan could ever do.

CHAPTER TWO: PARTICIPATION

We start with the people who live and work in the university: the students, faculty and staff. In the University of Oregon there are 16,000 of them. We consider it essential that all these people are able to take part in the process by which the university grows and changes - for the simple reasons that these people - all 16,000 of them - are the people who know most about how well or badly things are working out, and most about their needs.

What exactly do we mean by "participation". We mean any process in which the users of the environment play a key role in the design of that environment. The most minimal kind of participation, is the users role as a "client" in the architects design process. The fullest kind of participation, is the kind where users both design and build their buildings for themselves, without the help of architects. We advocate an intermediate kind of participation, in which the users design their buildings completely, but that they are then built in the usual way, by contractors, and that architects play the intermediate role of preparing contract drawings for the contractor, according to the designs made by the users. We propose, in short, that from now on, all places built on the university campus, shall be designed by the people who use these places.

Participation, as it is seen in this context, is the coming together of groups at all levels of organization to create places for learning, living and working on the university campus. It is not restricted to traditional formal groupings such as department faculties. It would involve people on a campus-wide basis, forming an ad hoc group to design the entrance to the campus on 13th Street, two departments bringing in students, staff and faculty to design a meeting place, students altering the design of dormitories to meet current needs for community and privacy, secretaries modifying their work space, and a campus-wide team designing a bicycle network. Beyond this variety of communal projects, participation of the users of the university at the level of making decisions about priorities for campus development will take place through democratic representation in a committee responsible for campus planning. Both forms of user participation are seen as essential complements which are required to assure the balanced use of the university environment.

In this chapter we shall try to explain, as briefly as possible, why we believe that this form of participation is desirable. Let us begin by describing the reason for participation, in any form.

There are essentially two reasons for participation. First, it is inherently good; it allows people to become involved; it is good for their mental health; it allows people to feel related to the world around them, because it is a world which <u>they</u> have made. Second, the users of a building know more about their needs than anyone else does; so the process of participation tends to create places whose use is more balanced, and better adapted to peoples needs, than a centrally administered planning process can ever do.

We first discuss participation as an intrinsic good. When we say that people are able to become involved, and to relate to the world they live in, by participating in its design, there are actually two facets to this thought. On the one hand, people need the chance to make active decisions about the environment. This is a fundamental human need. It is a need to create; and a need for control. Empirical evidence shows clearly that whenever people have the opportunity to change the environment around them, they do it, they enjoy it, and they gain enormous satisfaction from what they have done. On the other hand, people need a chance to identify with the part of the environment in which they live and work; they want some sense of ownership; some sense of territory. The most vital question about people's environment is always this: Do they own it, psychologically. Do they feel that they can do as they wish in it; do they feel that it is theirs?

These two notions - of creative control, and of ownership, are of course related to one another. You cannot exercise control over your environment, unless you actually do have some degree of ownership of it. And you cannot feel any true sense of ownership, without also being allowed to change it to suit yourself. The first reason to encourage participation, then, is that it allows people to feel related to their environment, by giving them some sense of ownership, and some degree of control.

The second reason for participation, is that the users of a building know more about their needs than anyone else; and that it is virtually impossible to get a building which is well adapted to these needs, if the people who are the actual users, do not design it.

There are countless stories, for example, of frustrated scientists, trying to describe the nature of a laboratory, to an architect, being unable to communicate their needs to the architects, and ending up with a building that has insufficient light, too little acoustic isolation in the crucial places, not enough storage, no windows where they are needed, no places to sit and think, no proper relation between adjacent workplaces, and on and on. It happens all the time. It has happened, in the University of Oregon, in Science II.

To some extent this problem is overcome by the use of patterns. The patterns do describe, in objective terms, the major relationships needed in a place, to solve its most important needs. But there are countless other needs, not described in the patterns. When a user designs a building for himself, he takes these needs into account as a matter of course, because he can feel them, and he can feel intuitively, what is wrong, when he has not yet solved them properly. In this way he is able to meet needs which he cannot even put into words. When the user has to communicate his needs to an architect, the only ones he can hope to have satisfied, are the ones which he can state, in simple four letter words.

Participation in the design of learning, living and workplaces goes beyond this kind of exchange between an architect and his client. First and foremost, it involves the initial recognition by users that their environment is not functioning properly. It is simply not possible for an outside architect to tell which places are in balanced use and which places are not. Only the day to day users of places are aware of the deficiencies, and are consequently the only proper agents for their amelioration. <u>The making of the environment is too sensitive a process to be left to architects</u>.

A sensitive approach to the environment requires continuous feedback from its users. At present, there are no feedback mechanisms to assure the adaptation of the environment to its users at all times. The way to introduce these feedback processes is for the users to resolve for themselves how to overcome the difficulties with their present environment, how to make it accommodate them, how to allow learning, living and work to take place.

Again, the definition of "user" must be taken literally. A professor of anthropology understands little about kitchen requirements. When it comes to the kitchen in the cafeteria he is not to be considered a user. The same professor understands the requirements of a lecture room when it comes to lecturing there, but not necessarily when it comes to listening to a lecture there. Users of places have to participate in the process of making them. Users are experts in their own needs.

It is clear, now, that widespread participation has important advantages. There are, however, also important objections to the idea of participation. To be convinced that participation is truly desirable, and feasible, we must answer these objections. There are two main objections: First, that it will create chaos, because people don't know what they are doing. Second, that since most students, and many faculty, stay at the university for less than five years, there is no reason why they should be allowed to design the places in the university, since in the long run, the actual users, will not be the same as the users who do the designs.

We first discuss the objection that user-design will create chaos in the environment. The recent history of architecture and planning has created the false impression that architects and planners are the only people who know how to lay out buildings. This impression is false; almost all the environments in human history, over a period of thousands of years, have been designed by lay people. Many of the most wonderful places in the world, now avidly photographed by architects, were not designed by architects, but by lay people.

But of course, in order to create order, not chaos, people must have some agreed on principles, which enable them to relate parts of the whole, and to make designs which have a united character. Nothing would be worse than an environment in which each square foot was designed according to entirely different principles. This would be chaos indeed. In our proposal this problem is solved by the use of the patterns, which we shall discuss in Chapter 3. These patterns, once agreed on by the university community, give the users a solid basis for their design decisions. Within the frame work of these principles, each person, and each group of people will be able to make unique places; but always within the unified and harmonious framework, created by the underlying morphology of the patterns. In short, the patterns will play the role, within the university, that tradition played in a traditional culture. Within the framework of the patterns, we can be sure that the process of participation will create a very rich and various order.

The idea that participation does not make sense, because the people who use it in the years to come will not be the ones who designed it, is more subtle. At first sight, it seems correct. The reason that it is incorrect, is that it is based on a misunderstanding of the real purpose and effect of user design.

When a group of Ph.D. students in physics, design a coffee lounge where they can discuss physics, the character which they create is not adapted primarily to their idiosyncracies as Tom and George and Harry. First and foremost, the place is adapted to the needs of a group of Ph.D students, discussing physics; and if they have done their work well, it will be as comfortable for the next group of Ph.D. students as for the first group.

Of course, it is true that the design made by one group of users will be slightly different from the needs of some later group of users. But before we over-emphasize this problem, let us remember the alternative. The alternative, widely practised today, is that the design is not made by users at all, but by a group of architects and administrators who are far more remote from the problems experienced by the users.

There is no way of avoiding the fact that the environment will be designed by people different from the ones who end up living in it. The only question open is: How different shall they be? It seems clear that we should choose people who are as similar as possible in their needs and habits as the people who will ultimately use the building. Since one group of Ph.D. students knows more, far more, about the needs of another group of Ph.D. students, than any group of architects and administrators could ever know, it seems clear that we should put the design in the hands of the users anyway, even though we know that they will be followed by generations of other users, and are not designing the building only for themselves.

To drive the point home - it is important to recognize that, on the housing market, personal and individual houses are always worth more tn mass produced ones. When you buy such a house, it fits you better, <u>not</u> because you are the person who created it - but simply because <u>a particular person</u> created it. This simple fact in itself, is enough to guarantee that the places in the house are more real, better adapted to use, and more closely in tune with the actuality of living, than any house created for the mass market, by an impersonal designer. This is just what will happen in the university. As places are created by the people who pass through them, gradually the university will have an environment which is an accumulation of actual human experience, and, as such, will be a fit place for other, newer human experiences - a far fitter place than any impersonal and inflexible environment could ever be.

CHAPTER THREE: BALANCE

If the people who live and work in the university, are to control its design, we must start with a very much clearer idea than we have today about what a good environment is like. Without widespread agreement on at least the most general aspects of this question, full participation by 16,000 people in the design of a university could only create chaos.

The key to this agreement lies in the fact that the difference between a good university environment and a bad one, though often said to be subjective, is in fact objective. This is not to say that every university needs the same kind of environment: what is good for a university of one type, in one culture, is not necessarily good for another. But nevertheless, the fit between a particular student-faculty group with their own particular traditions, and their university is an objective matter, which hinges on the social, spychological, and biological truths about those people. When this fit is good, the university environment will support the processes of teaching and learning and living, and these processes will flourish. When the fit is bad, teaching and learning will be stifled.

In order to define a "good" university environment precisely, we have defined nineteen types of place which are the major parts of a university. These nineteen place-types are: CAMPUS, DEPARTMENT, STUDENT HOUSING, ADMINISTRATION, PUBLIC BUILDINGS, PARKING, LOCAL ROADS, OUTDOOR PLACES, PEDESTRIAN PATHS, BIKE PATHS, STUDENT GATHERING, CAFES AND SHOPS, SPORTS, LIBRARIES, CLASSROOMS, FACULTY OFFICES, STUDENT WORKPLACES, ENTRANCES, CORRIDORS. We may, of course, disagree about the exact choice of nineteen place types; but taking them as they are, for the moment, we can see that a university environment is essentially a nested arrangement of these nineteen kinds of places.

Now, each kind of place, being associated with certain activities and social processes, is susceptible to certain characteristic problems. So long as these problems remain unsolved, in any given place, there is little chance that this place will support the activities which go on there. To solve these problems, each place must have certain specific geometrical properties. We call these properties "patterns". We may therefore construct a list of patterns, for each of these nineteen kinds of places; and we may then say that a place will be well-adapted to the needs which occur there when the patterns are present, and will be maladapted to these needs when the patterns are missing. This allows us, then, to use the patterns as very direct criteria for the success or failure of the various places in the university.

The patterns are given in Chapter 7. We do not claim, of course, that this list of patterns is perfect, nor that it is comprehensive. Indeed, it is certain that there are mistakes and omissions in the list; and that is why the ongoing criticism and review of the patterns, by the users, is so essential - to make sure that they do gradually come to reflect the true nature of the universitys problems more and more closely. Nevertheless, to a first approximation, the patterns now given in Chapter 7, do give us a set of necessary and sufficient conditions for the proper functioning of the nineteen stated parts of the university. The list of these patterns follows:

CAMPUS	University size University shape and diameter Town integrated with university University as marketplace

DEPARTMENT	Department size Department space standards Fabric of departments Living woven into learning University as a marketplace Department hearth
STUDENT HOUSING	Students close to campus Living woven into learning Student household mix Student community size Private access to each apartment Kitchen clusters
ADMINISTRATION	Administration decentralized Small services without red tape Proximity analysis
PUBLIC BUILDINGS	Human scale in public buildings Buildings shaped for light Horizontal office communication Feeling of shelter Social spaces define structure
PARKING	University parking Nine percent parking Cars surround pedestrian islands Parking structures Short term parking Tiny parking lots
LOCAL ROADS	Looped local roads Cars surround pedestrian islands Cruising loop T-junctions Paths interrupt roads
OUTDOOR PLACES	Access to a green Convex connected spaces South facing open space Small open spaces Patios which live Trees must stay Places at the edge of buildings

PEDESTRIAN PATHS	Cars surround pedestrian islands Territorial ambiguity University as a marketplace Paths interrupt roads Centripetal pedestrian paths Ample street lighting
BIKE PATHS	Bike paths and racks
STUDENT GATHERING	Activity nuclei No isolated student union Realms between departments
CAFES AND SHOPS	Town integrated with university Real learning in cafes Activity nuclei
SPORTS	Relax: leisure is a part of learning Activity nuclei
LIBRARIES	Campus library decentralized Activity nuclei Stacks and carrels integrated
CLASSROOMS	Classroom size and distribution University as a marketplace Seats outside meeting rooms
FACULTY OFFICES	Students near faculty offices University as a marketplace Primary groups among students and faculty Light on two sides of every room Thick walls
STUDENT WORKPLACES	A workplace for every student Primary groups among students and faculty Students near faculty offices Light on two sides of every room Thick walls
ENTRANCES	Entrance location Circulation realms Territorial ambiguity Bike paths and racks Entrance shape

CORRIDORS

Short corridors
Circulation realms
Territorial ambiguity
Corridors which live

We now define the concept of "balance". We shall say that the university environment is balanced, when every single place in it, that belongs to one of the nineteen place-types has all the patterns which that place-type requires. We give this definition with full respect to the fact that the patterns are incomplete and need to be improved. As soon as they are modified, to reflect new problems, or to reflect existing problems more accurately, the exact definition of balance will be modified as well. The idea of balance will, in short, itself become gradually more and more sound, as the patterns themselves become more sound.

However, even with the patterns which exist at present, this concept of balance is far-reaching and profound. Very few of the places in the University of Oregon, in any of the nineteen categories now satisfies the necessary patterns perfectly. This is shown in full detail, in the diagnosis of Chapter 8, where we state which patterns are missing from each of the various places in the university. It is clear, therefore, that the university environment is in very poor condition at present, and that the university's capacity to function as a place of learning is seriously impaired by its defects.

This situation cannot be corrected unless the university's capital construction program is devoted single-mindedly to the task of bringing the environment into balance. It is clear therefore, that we must begin to see the process of capital construction as a process of gradual repair, which tackles all the various places in the university, and gradually improves each one of them, until it satisfies the patterns which it has to satisfy.

Before we go any further to explain this task, we shall contrast it with the current approach to capital construction.

In the current view of university development, the only attribute of space which is given much attention is "quantity". Although there are exceptions, the fundamental motive for new construction is "lack of space" or "overcrowding". What happens, then, is that the university monitors its various places constantly, and when any one of them becomes overcrowded, new space is built to relieve the overcrowding.

It is true, of course, that the amount of space available for a given function, is important. For every one of the nineteen place-types, at least one pattern defines the sheer amount of space required to support a given number of users. When places are overcrowded, it is almost impossible for them to function well. However, there has in the past been too much emphasis on patterns which deal with "amount of space", and to little emphasis on patterns which deal with "arrangement or organization of spaces".

The problem is made particularly complex by the fact that the key decision makers are concerned with spending public money wisely - and that it is easy for them to see what money is buying when it buys a "quantity" of space - and much harder to see what it is buying when it buys "organization" or "arrangement" of space. It is however, essential for the people who are spending public money to realize that the repair of deficiencies of organization is as crucial as the repair of deficiences of space.

Every schoolboy is taught the idea that the "raw materials" in the human body - the chemical elements - are worth only a few cents, and that it is their organization which makes them valuable. A view of the human body which gave it emphasis to the amount of material present, without respect for the way this material is organized and the complexity of its organization, would be entirely trivial. Just so, a view of a university which looks at the environment only in terms of the amount of space available in various categories, without respect for the way these spaces are organized, is also trivial.

In order to understand this clearly, we shall now discuss the results of poor organization and imbalance, in concrete everyday terms which everyone can see for himself.

We know when a place is too small for its function - because we can see with our own eyes that it is overcrowded. But the fact that a place is overcrowded is merely a special case of a more general kind of observation: namely, the fact that a place does not have a degree of use which is appropriate to its function. We can see that a place has something wrong with it when it is overcrowded; but we can equally well see that a place has something wrong with it when it is under-used.

If a garden is sunless, so that no one goes there, it is a fairly useless garden. If an office is so badly located that it gradually fills up with discarded junk, we know it is not working. If a classroom is too large for the classes which professors actually hold there, and is always two-thirds empty, it is wasteful and uncomfortable for the small groups who do try to meet there. In all of these cases, the fact that people are not using the places, betrays the fact that something is wrong with them.

Let us examine this in rather more detail, by means of an example: a lecture hall which isn't working very well. That fact that it isn't working will manifest itself through over-use or under-use.

Imagine, first of all, that the lecture room is over-used. What may be the reasons for its over-use?

1. It is too small to handle the large crowds who come to hear the lectures. It becomes unpleasant to attend a lecture and unpleasant to give lectures, there.

2. There are too few lecture halls. In this case the room is used by groups of different sizes, many of them too large or too small for the room: and scheduling makes lectures follow each other so unrelentingly, that there is no space or time for prolonged discussion after lectures.

3. The lecture hall is incorrectly located, with respect to other lecture halls. In this case it will be over-used, while other lecture halls are under-used, because they are located too far from the areas which generate lectures.

These problems of over-use are familiar and obvious. Let us now take the other situation. Imagine that the lecture hall is under-used. Again there are several possible explanations.

1. There is not a sufficient need for lecture space to fill the room. In this case, the resource is being wasted, and should probably be turned over to another use. It is possible that the under-use is only temporary - but also quite possible that lecturing as such, is an activity which is falling off, because it is proving itself ineffective, so that the lecture hall is a wasted resource, even in the long run.

2. The lecture hall is badly located. Given the distribution of facilities on the campus, the current need for lecture space is in a different part of the campus - again, the resource is being wasted.

3. The lecture hall is under-used, because it is so badly designed, that people have found by experience, that it is hard to lecture there, and people find that the lectures in this particular lecture hall are dull, uninviting, so they stay away. Again, obviously, the resource is being wasted.

4. Finally, an even more subtle point, and much harder to establish: the lecture hall is filled to capacity, all day long - but this is so because students know that they will get poor grades if they don't take notes, mechanically. The use of the lecture hall is not genuinely productive - because students are thinking about something else, distracted by the noise of nearby trucks, unable to see the lecturer, etc. Again the room is wasted, and in any real sense, under-used.

All the problems which can crop up in a lecture room, have the result, in the end, that the lecture room is either under-used or over-used. The lecture room has balanced use - appropriate to its function, only when it is placed, and sized, and designed, according to the patterns which a lecture hall must meet, so that its potential problems are solved.

Whenever a place in the university is either under-used or over-used, this is a symptom of the fact that it isn't solving functional problems properly. In such a case, either resources are being wasted because a potentially valuable place is just not used, or resources are being wasted in the deeper sense that the unsolved problems associated with that place, are helping to undermine the learning and teaching of the university.

It should be clear from this discussion, that whenever places are out of balance, money must be spent to repair them - and that spending money to enlarge those places which are overcrowded, is simply a special case of this more general principle.

We have said already, in Chapter 2, that we consider the process of participation by the users to be of great importance. Given the fact that we have now argued that the university environment is defective, to the extent that its individual places are defective, it seems natural to encourage members of the university community to help identify the places which are most imbalanced (since they, the users, are the people who can see this most quickly) and to encourage them, also, to come forward with proposals for repairing these defective places.

To make this process as simple as possible, we shall finish the chapter by building one more conceptual bridge. We shall try to show that the places which are out of balance are just those places which people intuitively consider ugly: and that the places which are in balance, are just those places which people intuitively consider beautiful.

Take, as an example, the beautiful grove of trees between Johnson Hall and Susan Campbell Hall. Everyone sees the beauty of this place. But people tend to under-value their own perception of its beauty. They do not see clearly that this beauty, which they recognise, is no mere facade, but that this place is beautiful because it lives - it sustains life. There are not many places left in the university which are quite as beautiful - but there are a few. The entrance and arcade to the Education Department, the first floor rooms in Deady Hall, the path between Deady and Allen that looksinto the print shop, Dean Tyler's office, the faculty club, the inside of Girlinger, the parking lot beside Chapman, the cemetery, the knoll behind the School of Music. These places are all beautiful too - and everyone can feel it. None of them is overused; none of them is underused. If you look carefully at the patterns listed for these kinds of places in Chapter 7, you will see that every one of these places has the patterns which it requires.

Compare these places with the places which nearly everyone sees as ugly: The student rooms in Bean, the offices in Prince Lucien Campbell; the Science plaza, the interior court of the Science library, the corridors of Science II, the main entry hall of Science II, the parking lot across from Carson Hall. Many people have been so confused by recent writing about modern architecture and planning, that they sadly tell themselves "I suppose these places are functional, even though they seem so ugly". But the idea that these places are functional is an absurd play on words which actually means nothing more than that they vaguely resemble machines. In fact, they inhibit function. They prevent people from acquiring the experiences necessary for their development; they prevent people from learning; and as a result they are of course under-used. Nobody wants to be in them, if they can possibly help it. If you look at the patterns listed for these kinds of places in Chapter 7, you will see that every one of these places lacks the patterns which it requires.

We see then, that the places in the university which people recognize as beautiful, are just the places which are in balance, and which are helping to sustain the processes of learning and teaching. The places which people recognize as ugly, are just the places which are either grossly under-used or grossly over-used, whose presence in the university environment is undermining teaching and learning.

This simple conclusion leads to a very simple remedy. In order to bring the university environment into balance, so that teaching and learning may be as effective as possible, we must abandon any narrow pseudo-scientific concept of "functional architecture", and encourage people to identify the places which they consider dead or ugly; and then to encourage them to find ways of modifying these places, in a manner consistent with the appropriate patterns.

If such a process is carried out firmly, and helped by as much as possible, administrative procedures, we believe that the university environment can be brought back into balance within a reasonable number of years - perhaps within ten or twenty years - and can, from then on, be maintained permanently in a state of balance, by continuous and ongoing repair.

CHAPTER FOUR: PIECEMEAL GROWTH

It is clear from Chapter 3, that it is only possible to make a great university, which is perfectly in balance, by a gradual program of repair, in which the nineteen types of places within the university are monitored continuously, and repaired whenever they lack the necessary patterns. Common sense suggests that it will be easier to carry out this program in small steps, repairing one thing at a time, than in large steps, and that building projects should therefore be smaller than they are today.

It is also clear that full scale participation by students, faculty and staff cannot happen so long as building projects are huge. Once again, common sense suggests that it will be easier for people to get involved if there are many small building projects going forward, instead of a few large ones.

On both counts then, it seems that a large number of small building projects would make more sense in any given year, than a small number of large projects. For this reason, we shall now discuss the size of building projects, with special attention to the contrast between large projects and small ones.

Let us first look into the notion of repair. Any living system must repair itself constantly, in order to maintain its balance and coordination, its quality as a whole. In the case of an organism, it is only the constant repair, maintenance of chemical fields, replacement of cells, healing of damaged tissues, which keeps constant the basic morphology of the organism, the basic patterns governing its form. Failure to maintain its morphology through these incremental changes, failure to arrest damage, or failure to arrest cancerous unregulated growth, will result in breakdown of the organism.

In the case of the environment, which is also changing all the time, the process of repair and piecemeal growth needed to maintain its morphological integration, is far more complex. It is not merely a matter of creating repair in the fabric in order to conserve its properties. The environment must also continuously adapt to the changing uses, lives and activities which it sustains. This means that the process of repair and piecemeal growth has to create a gradual sequence of changes, which guarantees that the environment is in balance, in each of its parts, at every moment of its history.

All the good environments that we know have this basic feature in common: They are whole and alive because they have all grown rather slowly over long periods of time, they have old and new blended together in rather small increments. They have adapted to chaning users. They have adpated to changing needs. But they have even been torn down, never erased, never merely replaced with something new: instead always embellished, modified, reduced, enlarged, improved. This attitude to the repair of the environment, has been commonplace for thousands of years in traditional cultures. We may summarise the point of view behind this attitude, in one phrase: piecemeal growth.

The importance of piecemeal growth is obvious. However, obvious as it is, this point of view is not widely shared by architects, government administrators, developers, and financiers in 1971. Instead, most of the poeple concerned with university development in the last twenty years, have taken an almost opposite point of view - a point of view which we may call "large lump development".

In large lump development, the repair of the environment is done in massive chunks, instead of piecemeal. All buildings are assumed to have a certain finite lifetime; the process of environmental growth is seen as a process in which those buildings which have reached the end of their lifetime, are torn down, and replaced by huge complexes, again assumed to have a certain lifetime; it is assumed that it is better to be in a new building than in an old building; and the money spent on the environment is concentrated in these huge new projects, while the money spent maintaining old buildings is reduced to the bare minimum.

We shall now contrast the process of piecemeal growth with the process of large lump development, and shall try to show that large lump development is worse than piecemeal development in almost every way that matters. Before we list the specific advantages, of piecemeal growth, it will be well to have a good overall grasp of the character of these two processes. Their character alone, will raise the suspicion that large lump development is dangerous and inadvisable; while piecemeal growth is sane and healthy.

Very simply, large lump development hinges on a view of the environment as a static and discontinuous system; piecemeal growth hinges on a view of the environment which is dynamic and continuous.

According to the piecemeal point of view, every environment is changing and growing all the time, in order to keep its use in balance; and the quality of the environment is a kind of semi-stable equilibrium in the flux of time. According to the large lump point of view, each act of design or construction is an isolated event, which creates an isolated building - "perfect" at the time of its construction, and then abandoned by its builders and designers forever.

The static character of large lump development, and the dynamic character of piecemeal growth can be seen most easily in terms of money. In the static view, a building gets built, then it gradually deteriorates for thirty, forty, sixty years - then it gets torn down, and another building is built to replace it. In this view, the money is spent in discontinuous chunks, with long gaps of no or little spending in between. Each project costs 2-6 million dollars. In the dynamic view, the spending of money is continuous. Each month a certain amount of construction is taking place: a room is added here, another room changed, a new roof built, a new garden made - but these changes are made year after year - not all at once. There are many many small projects, overlapping in time; no one project costs more than a few thousand dollars.

The two views can be contrasted in another way. In the large lump view, buildings are born, and then they die. They are built fresh and clean; they decay gradually; and when they are so neglected that they cannot be repaired, they die. In this view there is no continuity in the environment from generation to generation or from age to age. In the piecemeal view, buildings never die. A building is merely a moment in the history of an environment - in the years preceding this moment, the building was a little different - and in the years following it will be different again. But although buildings change constantly, by growth, repair and change, they never die altogether. Some part of them is always there - in fact, by a kind of natural selection, it is the best loved parts, which last the longest - some of them for thousands of years.

And, as this example shows, the views can be contrasted in still another way. According to the large lump view, since buildings are appearing out of nowhere and dying, all the time, it is essential that the environment is seen as an assembly of elements - each one of them replaceable. The land between the buildings, is, naturally, seen as a void - the left over space between the buildings. According to the piecemeal view, however, the environment is seen as a continuous fabric - which covers all buildings and all outdoor spaces - and the changes which are made within this fabric are merely changes in the totality of the fabric.

It is not necessary, nor always possible, to identify these changes as changes in any one particular building. Many of them are changes which are changes between buildings, or changes shared by buildings.

We see then, that each of these three ways of seeing the difference between the large lump and the piecemeal view, has, at its heart, the same difference. The large lump view is static and discontinuous; the piecemeal view is dynamic and continuous. In the large lump view the spending of money, the birth and death of buildings, and the larger environment itself are all static and discontinuous. In the piecemeal view the spending of money, the life of the buildings, and the larger environment itself are all seen as dynamic and continuous.

It is not hard to imagine that the dynamic view, which embraces continuity in so many different ways, is healthier and more constructive, than the static view which relies on all kinds of discontinuities. In the next few pages, we shall show that this difference between the two views is not only intuitively more attractive - but that balance and participation simply cannot be achieved except by piecemeal growth.

<u>Participation requires piecemeal growth</u>

We said, in Chapter 2, that the environment will be better when the people who live and work in it participate in its design, because this guarantees that, at least to some extent, the environment is well adapted to their needs. The concept of piecemeal growth is absolutely necessary to make participation work. <u>People can get involved in the design of small projects; they cannot get involved in the design of large projects</u>.

The reason is simple. No group of more than about a dozen people can undertake any project directly together. This means that any project which serves more than a dozen people is already beyond their immediate reach. If the project serves 50 - 100 people, it is possible for everyone to be involved, at least by representation - and no person is removed by more than one step from the process of design. When a project serves more than 100 people, or more than 1000 people, it is clear that design decisions must be made by a bureaucratic group, far removed from the people who will live and work in the building. Inevitably such a building will be impersonal and alienating.

It is worth mentioning a second view of this problem, which leads to the same conclusion. When a committee has to discuss a budget, it has been found that committee members spend "far too long" discussing small projects - like the painting of a garden fence - and far too little time discussing huge ventures like the construction of a multi-million dollar factory. What happens, is simple. The members of the committee can relate to the building of a garden fence, so they can talk about it; they have intelligent and reliable intuitions about it. When it comes to the construction of a multi-million dollar factory, they cannot relate to it, so it is discussed at a very abstract level, and decisions are made very quickly. In short, even at the highest levels of decision-making, men cannot involve themselves in any serious emotional or intuitive sense in the design of huge ventures. They can always involve themselves in the design of small projects.

There is a third reason why participation requires piecemeal growth. People will participate only if they feel responsible for their environment; and they will feel responsible only if they can identify the parts of the environment which "belong" to them. Large lump development does much to rob people of this feeling. When large buildings are built, people and departments are treated as objects, and bundles of them are allocated to slots in the buildings, just the way that crates are allocated to holds inside a cargo ship. Treated like this they feel little sense of ownership, and no responsibility, because they are alienated from their environment. Partly as a result, and partly because the buildings are just so large, the care and maintenance of buildings passes more and more into the hands of the university "maintenance staff", and is taken even further from the hands of the people who actually work there. With their sense of territory taken from them, people cannot take responsibility for their surroundings, and the university environment soon deteriorates.

Contrast this with the effects of piecemeal growth. Piecemeal growth tends to leave people and departments where they are. They gradually develop a sense of pride and territory which encourages them to take care of the buildings and gardens around them - and to love them and do the best they can for them, even when they are decrepit.

For all these reasons, large lump development prevents people from getting involved in the design of their own buildings. <u>Piecemeal growth, because it relies on a large number of small projects, allows and encourages people to get involved in the design of their own buildings, and increases the absolute number of people who can get involved.</u>

Balance requires piecemeal growth

We said in Chapter 3, that the university environment will only support learning and teaching when it is in balance: and we made it clear that it can only be brought into balance by a gradual program of repair. It is quite impossible to conduct this program of repair effectively, within a program of large lump development. Repairs can be made effective, and will gradually create a balanced environment, so long as there are many small projects every year; but if the money is spent on large projects the environment can never become balanced.

The first and most important reason for this fact is this: Any building which is built, always has mistakes in it. This is partly because we architects and planners know so little about the effect of the environment; and partly because it is simply part of human nature to make mistakes. The mistakes show up gradually during the first few years of the buildings use. Unless money is available for repairing these mistakes, every building which is built, will always be, to some extent, unbalanced.

Large lump development works against the possibility of repairing these mistakes in two ways. First, the large projects on a capital construction budget always drive out the small ones, and, in particular, they drive out those very smallest ones which are concerned with making minor corrections in the environment. The administrators responsible for large building projects seem to believe that architects are infallible - and fails to acknowledge the near certainty of error, and therefore fail to set aside any substantial sums of money for these minor corrections. Buildings made under the impact of this kind of thinking, fit their users just about as well as a made-to-measure suit would fit its wearer if he refused to go to the tailor for a fitting.

But large development works against the possibility of repairing these mistakes, in a more obvious and more serious way also. Any mistake which is made, is likely to be multiplied by the sheer scale of the large buildings - so that it requires a considerable sum of money to correct even a minor mistake. In the College of Environmental Design, at Berkeley, for example, the wrong light fixtures were installed, with the result that the hum of the fluorescent tubes is high enough to interfere with speech throughout the building. Since the building has 225,000 square feet, the cost of repairing this one tiny mistake would have been $20,000 - a sum of money that just wasn't available - so, seven years after the building was built, people still can't hear themselves think in their offices and seminar rooms.

In piecemeal growth the mistakes are smaller to begin with. Indeed, within the context of piecemeal growth, it is perhaps even misleading to call them mistakes. Piecemeal growth is based on the assumption that adaption between buildings and their users is a necessarily slow and continuous business, which cannot, under any circumstances, be achieved in a single leap. It is simply understood therefore, that there must be money set aside, for every part of the campus, every year, so that the ongoing process of adaptation can continue, everywhere, in every fiscal year.

It will be clear from this discussion that large lump development not only fails to create balance in the long run, but that it also leaves more users dissatisfied, for more of the time, than piecemeal growth.

Under large lump development, no one department can hope for construction funds more than every twenty or thirty years. As a result, department heads naturally exaggerate their needs, since the future is unpredictable, which enlarges their projects, and makes it even less likely that other departments can get any money. Further, once a department has its project built, it has little or no hope of getting any further money for years.

Since no building ever fits its inhabitants perfectly, just after it is built, this leaves every department in the sorry situation that they cannot meet their needs, and they have no hope of meeting their needs in the foreseeable future. So long as large lump development is going on, this is the situation for most of the departments, most of the time. They are stuck with what they have; they can do nothing about it; and when they do finally have a chance to do something about it, they put all their eggs into one huge basket, and can then again spend the next twenty years living with the inadequacies of their newest mistakes.

Under piecemeal development, none of this happens. Instead of most people being frustrated most of the time, most of the people are satisfied most of the time. This happens because money is used only for needs which actually exist, right now; this reduces the total annual need so radically, that it makes enough money available to provide for all those needs which actually occur, <u>when they occur</u>, no later.

The uneven character of large lump development works against the possibility of creating balance in one more way. It makes virtually certain that large parts of the university will deteriorate so rapidly, that they become slums.

This follows naturally from the fact that all the available money is always being gathered together to pay for the large lumps: there is never any money left over for the buildings which are not currently under construction, so that there are always large parts of the environment which are chronically under-maintained.

Many buildings on the University of Oregon campus are not in good order. According to Unruh's report (Campus Development Guidelines, Office of Planning and Institutional Research, 1968, p. 11) "The university is now operating on a major space deficiency basis since it is currently using completely substandard and inadequate space for a substantial proportion of its office and research functions". In a recent newspaper report on the university's financial problems ("Financial Woes Near Crisis ...", Eugene Register-Guard, January 31, p. -A) it is stated that "according to the State System of Higher Education planners, half the structures on the U of O campus need to be replaced and another 10 percent are in need of major rehabilitation; one out of five university buildings is more than 40 years old".

Central cities in the United States are turning into slums, for the very same reasons. Big projects tend to go to the periphery where there is more and cheaper land, leaving the center, which traditionally supports the most various activity, under-maintained and dying. This is the classic situation in the CBD's of modern cities. Industry, shopping, residential go out to the suburban edge leaving the center to decay. The model applies equally well to a campus. Originally there is a center. The center gets old and run down about the same time the new complexes are built out on the periphery. The cost of the new construction is vast, and the repair required to revitalize the center is passed over. The center cannot be abandoned. It is still the most intensely used spot. But the more it gets run down, the less inviting it becomes; soon it becomes a slum. The present policy of large lump development, if continued for another two decades, will almost certainly make parts of the University of Oregon a slum by 1990.

In order to take care of the university, as a whole, we must take care of <u>all</u> of it, <u>all</u> of the time. What this means, is that the available resources must be spent in a way which distributes the improvements uniformly over the space of the university. To put this in extreme, but graphic terms, it means that when we have one dollar to spend, we should spend it evenly, across the board, so that every square foot of the campus gets the same percentage of this dollar.

Piecemeal growth comes much closer to this ideal than large lump development. Each year, a little money is spent on parking, a little on improving the dorms, a little on improving the lecture halls, a little on improving the outdoor places, a little on each of the academic buildings. Slowly, but surely, the university environment will get better and better - with no part of it left to rot - and as the development goes forward on all fronts at once, gradually the various pieces of development will come to form a whole.

Finally, the fact that all the places in the university are getting attention at the same time, means that the relationships between these places are <u>also</u> getting attention. And it is the relationships between the places, which are at the root of balanced use. If a few places are given all the attention in a given period, and all the other places are neglected, it is virtually impossible to maintain the relationships <u>between</u> places which make the university environment work as a balanced whole.

<u>For all these reasons, piecemeal growth works to create balance; large lump development tends to break it down.</u> It is virtually impossible to make a balanced university environment unless the university's fiscal policies encourage piecemeal growth.

Economics

The foregoing arguments make it clear that piecemeal growth is very much better for the university than large lump development. However, one possible doubt remains. It may cost more. One of the reasons often given for the huge scale of buildings built under large lump development, is that it is cheaper to build this way. If this were true, it would follow that piecemeal growth might be impractical on economic grounds, no matter how desireable.

In the following pages we shall try to establish that the supposed cost savings of large buildings are largely mythical. As far as the available evidence goes, it appears that small buildings cost no more, per net useable square foot, than large buildings. In fact, we have found that cost of construction generally increases with size and height of buildings. These increases result from the following.

First of all, large buildings require more expensive construction techniques. The type of construction required is a part of the Uniform Building Code used throughout the country. The Code specifies requirements for fire safety and soundness of structure with regard to the height and size of buildings. A thorough analysis of building costs must include these variations.

In Table I we indicate the type of construction required to satisfy the Uniform Building Code for school buildings of varying sizes, ranging from 5,000 to 130,000 square feet; and, heights ranging from one storey to eight stories. The raw costs per square foot vary from 14.78 to 24.00 dollars. However, for those types of construction with a life of less than fifty years we must add the present value of supplying a similar structure for the years of its reduced life (see Col. 7, Table I). Even when we add this factor, we see from the table, that small buildings still cost less per square foot, than large ones.

The other major increases in the cost of large buildings result from the loss of useable interior space, provision of elevators and a 1% cost for constructing each additional storey. The 1% addition to total cost is based on recommended procedures for estimating construction costs by Marshall and Stevens Valuation Handbook, 1970. The loss of useable space in high buildings is due to additional corridors, lobbies, elevators, and space given to mechanical equipment. To calculate these losses we applied percentages based on data provided by Skidmore, Owings and Merrill (see Col. 3, Table II). These data indicate losses of net useable space on the order of 10% of the gross, in the large buildings. The overall results of these cost variations are given below.

TABLE I

Cost per gross square foot for different types of construction.

ize of uilding	Height in No. of Stories	Construction Type Code	Construction Description	Life of Structure	Raw cost per sq.ft.	Cost per sq. ft. for reduced life of Structure	Total Row Cost
1	2	3B	4B	5	6C	7D	
5,000	1	V no hour	Wood frame or pipe columns	35	$14.78	$3.68	$18.46
10,000	1	IV no hour	Steel frame or bearing walls, brick, block or concrete	40	16.29	1.62	17.91
15,000	2	IV 1 hour	Steel columns, web or bar joists, block brick or concrete	50	19.90	*0	19.90
20,000	2	II	Steel or concrete, 2hr. fire proofing	50	22.50	0	22.50
30,000	3	II	"		22.50	0	22.50
40,000	3	I	Steel or concrete 4hr. fire proofing	50	24.00	0	24.00
50,000	4	I	" "	50	24.00	0	24.00
60,000	4	I	" "	50	24.00	0	24.00
70,000	5	I	" "	50	24.00	0	24.00
80,000	5	I	" "	50	24.00	0	24.00
90,000	6	I	" "	50	24.00	0	24.00
00,000	6	I	" "	50	24.00	0	24.00
10,000	7	I	" "	50	24.00	0	24.00
20,000	7	I	" "	50	24.00	0	24.00
30,000	8	I	" "	50	24.00	0	24.00

- From the Uniform Building Code
- Costs taken from Marshall and Stevens Building Valuation Service, 1970
- Value added for reduced life is calculated by assuming that a similar structure would be provided at the end of its life for a 15 year period and then discounted at 6% to its present value.

TABLE II

Cost per square foot of net useable space

Building size 1	Height in stories 2	% net useable space 3A	Total net sq.ft. 4	Cost per gross sq. ft. 5B	Gross total cost 6	Add cost of elevators 7C	Total building costs 8D	Cost per net sq. ft. 9
5,000	1	90%	4,500	$18.46	92,300	NA	92,300	$20.51
10,000	1	90%	9,000	17.91	179.100	"	179.100	19.90
15,000	2	90%	13,500	19.90	298,500	"	298,500	22.11
20,000	2	90%	18,000	22.50	450,000	"	450,000	25.00
30,000	3	90%	27,000	22.73	681,900	(2) 131,000	812,900	30.11
40,000	3	88%	35,200	24.25	970,000	(2) 131,000	1,101.000	31.28
50,000	4	86%	43,000	24.50	1,225,000	(3) 202,000	1,427,000	33.18
60,000	4	85%	51,000	24.50	1,470,000	(3) 202,000	1,672,000	32.80
70,000	5	84%	58,800	24.75	1,732,500	(4) 269,000	2,001,500	34.04
80,000	5	83%	66,400	24.75	1,980,000	(4) 269,000	2,249,000	33.87
90,000	6	82%	73,800	25.00	2,250,000	(5) 353,000	2,603,000	35.27
100,000	6	81%	81,000	25.00	2,500,000	(5) 353,000	2,853,000	35.22
110,000	7	80%	88,000	25.25	2,777,500	(5) 353,000	3,130,500	35.57
120,000	7	80%	96,000	25.25	3,030,000	(6) 433,000	3,463,000	36.07
130,000	8	80%	104,000	25.50	3,315,000	(6) 433,000	3,748,000	36.04

A. From interview with Skidmore, Owings and Merrill, San Francisco.

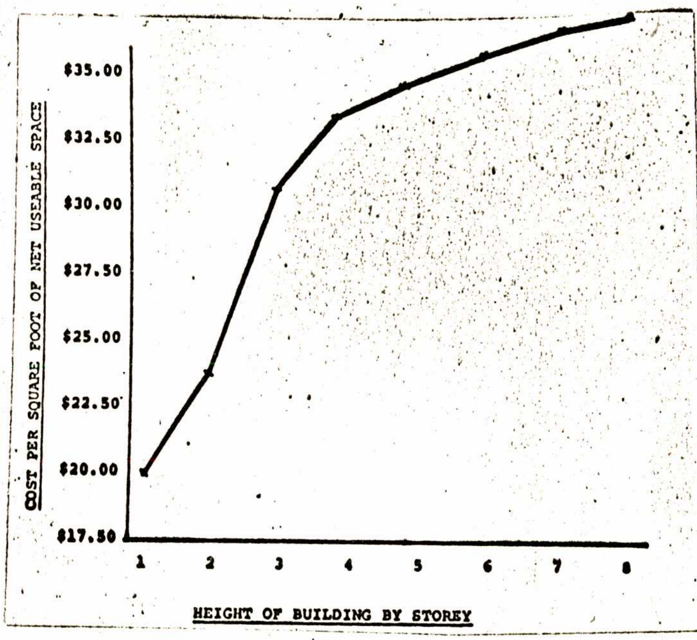
B. From Table I plus 1% addition for each extra storey.

C. These costs are based on Marshall and Stevens Valuation Service: $60,750 per shaft, 500 feet per minute, 3000 lb. capacity. $1625 is added for each stop. Number of elevators provided is based on assumption of 1 elevator for every 150 persons residing in the building.

D. Rounded to hundreds.

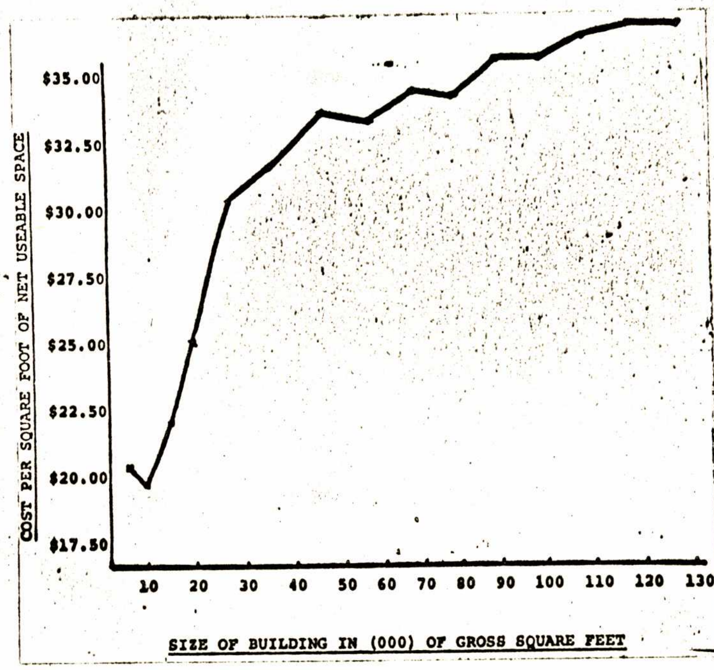
HEIGHT VERSUS COST OF NET USEABLE SPACE

The cost per square foot of useable space increases with the height of the building. The cost of building an increment of space in 5,000 to 20,000 feet of space one and two storey levels, costs on the average of $21.25 per net foot of useable space, while a building with a gross square footage of 70,000 to 130,000 square feet of six storeys and above costs approximately $35.00 per square foot of useable space. This represents a difference of about $14.00 per square foot of net useable space. The following graph indicates the increases in cost over a range of eight storeys.



SIZE OF BUILDINGS VERSUS COST PER SQUARE FOOT OF NET USEABLE SPACE

It is common attitude to think that cost per square foot decreases with the size of the building. This assumption is correct if buildings are of one type of construction and the measure is based on cost per gross square foot. When, however, we measure net useable space and vary the type of construction according to size and height, then the cost curve rises with the increase in the size of buildings. The graph below provides a good indication of when buildings are designed and built in large chunks. Cost per square foot of net useable space rise sharply when buildings reach a gross size of 20,000 square feet or more.



The foregoing analysis is based on abstracted data collected from the Marshall and Stevens Valuation Service. The study indicates tremendous increases in cost with increases in size of projects. While remaining highly abstract we can safely conclude that small buildings advocated under the piecemeal approach will at least cost no more than the current approaches to development.

To test this conclusion further we have gathered building cost data on seventy-two school buildings from many areas within the state of Oregon. The samples include buildings constructed through the State Board of Higher Education as well as local high school and elementary school districts. The cost per square foot is based on gross square feet. Net useable was not available for these samples; therefore, the cost averages do not reflect the cost of producing net useable space. However, even without taking into account the higher gross/net ratio characteristic of large buildings, we find the average cost per gross square foot for three different size categories to be about equal. The results are presented in Table III.

TABLE III

Size of buildings vs. cost/gross square foot

Size	Average Cost	No. of Buildings Sampled
0-15,000 square feet	$22.13	16
15-35,000 " "	23.39	20
35,000 + " "	23.35	36

To make the problem as concrete as possible, let us consider some examples of the ways that a piecemeal process of planning with designs made by the users, might lead to a breakdown of global order.

1. The waterfront needs development - it is badly out of balance. What happens if no user group expresses interest in it. Does this mean that it remains undeveloped for ever?

2. The bike paths are almost complete - but they are missing a crucial link - who will create this link. What if no one does?

3. It is possible to infer, from the patterns, that the university should grow towards the northwest - but the argument which leads to this conclusion is complex; and it is highly unlikely that individual project teams will happen to make this inference for themselves. How can this inference be recorded, once it is made - and how can it be communicated to the users.?

4. Experience with the use of the pattern language has shown that the best way of simultaneously taking care of University as a marketplace, Access to a green, Human scale in public buildings, and Activity nuclei and Buildings shaped for light, is to create a system of narrow pedestrian streets which surround or partly surround large open spaces. A group of users who have not had the benefit of this experience, may not be able to synthesis these five patterns. How can the information be recorded and transmitted to the users who need it.

It is perfectly clear from these examples that the problem of global order is not mythical. If some way is not found of coordinating all the piecemeal acts of construction, then there really will be a breakdown of global order in the university, and a considerable number of major problems will remain unsolved. Where shall the coordination come from? What must we do to make sure that some discernible, functionally valid, global order emerges from the piecemeal acts?

CHAPTER FIVE: THE EMERGENCE OF A WHOLE

We now come back to the central problem of planning, stated in the first paragraph of Chapter 1.

Let us assume that there is widespread participation by faculty, students and staff, in the process of design, as we have recommended in Chapter 2. Let us assume that there is a public body of agreed-on patterns, which define the basic properties which each part of the university must have, in order to function well, as we have recommended in Chapter 3. And let us assume that the fiscal process has been adjusted to allow for a much larger number of smaller projects every year, and that these projects are initiated and designed by user groups from many different walks of university life, according to the principle of piecemeal growth which we have described in Chapter 4. What will be the combined effect of all these piecemeal acts. Will they create a great university, if left in action for the next twenty years? Or will they create chaos?

How can we be sure that the concerted effect of all these piecemeal acts, will create global order in the university, and that all the many parts of the university, wehn built piecemeal, will have the right relationships to one another.

How can we be sure that a process of piecemeal growth, conducted by thousands of different people, will ever create a balanced whole for the University of Oregon, without instead creating a disorderly collection of fragments? How can we be sure that the gradual accumulation of buildings, built by individual participation and piecemeal growth, will in the end create an overall order at the University of Oregon, comparable in power and beauty to the overall order of the University of Cambridge.

We propose to solve the problem in a way that is almost perfectly analogous with the way that it is solved within a typical organism. We therefore begin by explaining the problem, and its solution, for an organism. When an organism grows, how is it that the millions of different cells that are growing at various places throughout the organism, manage to form a unified whole?

This question - perhaps the deepest and most important question of biology, is illuminating for the following reason. Here again, we have a process of piecemeal growth. It is clear that somehow, an organism manages to guide the piecemeal process in such a way as to create a unified whole. But it is also clear that the way this happens is not analogous to the totalitarian "master plan". There is certainly no huge blueprint, with billions of slots, which guides the nature and position of every cell according to some pre-ordained plan. Yet, somehow the organism grows as a whole, under the impetus of piecemeal processes. Plainly then, we can be sure that at least in biological systems, there do exist non-totalitarian processes which can create global order out of piecemeal growth.

How is the problem solved in an organism. Essentially there are two steps:

1. Diagnosis and creation of growth fields

The organism constantly monitors its own internal state. At any given moment, ther is, within the organism, some representation of the current difficulties: in particular, those parts of the organism where critical variables have gone beyond their allowable limits, are identified. We may call this the diagnosis. In response to the diagnosis, the organism sets in motion growth processes to repair the damage. It is fairly certain that the broad framework of this growth is governed by the endocrine system, which creates a variety of chemical fields throughout the organism. The fields are created by the changing concentrations of various hormones; together these fields guide the detailed growth, at the cellular level: These are the growth fields. The combination of concentrations, and the gradients of these concentrations within the field, define the extent of growth or repair which is to be carried out at any particular point.

2. Local repair impelled by the growth fields

The growth fields act chemically, to encourage growth in certain parts of the organism; and to inhibit growth in others. At those places where the growth occurs, the cells multiply. The detailed local configuration of the cells which grow at these places is governed mainly by the genetic code carried by every cell. This controls the exact development of the cells, and the arrangement of their growth, splitting, change and decay. In fine detail, this locat process is controlled by the interaction of the genetic code with the chemistry of the growth fields in which the cells are growing. This guarantees that the local configurations of cells are not only intrinsically suitable but are also properly integrated with the whole.

We see then, that the global order of the cells within the organism, is governed at two levels. First the growth fields create the context for growth, and determine the locations where growth shall occur. Then the genetic code carried by the cells controls the local configurations which grow at those locations; modified, always, by interaction with the growth fields themselves.

We propose to solve the problem of morphological integration in the university, by means of two very similar steps:

1. Diagnosis, and the creation of repair fields.
2. Local repair, carried out within these repair fields, in the form of individual projects.

Let us look at these two steps in detail:

1. Diagnosis and the creation of repair fields.

We have already said that a university environment is, a nested arrangement of nineteen different kinds of places, and that any particular one of these places will be in balanced use, or not, according as it has, or does not have, the specific properties defined by the appropriate patterns. It is therefore possible, to look at the various places in the university, at any given moment, and to say whether or not these places are in balanced use, by looking at the patterns which they have and don't have in them. Like a diagnosis, this will tell us which of the places in the university are in balance, and which ones need repair.

We propose that the university should conduct a diagnosis of this kind at regular, and frequent intervals (say every two years).

We present a detailed diagnosis, of this kind, for the University of Oregon, 1971, in Chapter 8. The diagnosis has nineteen parts, to correspond to the nineteen different place-types. We state each of the patterns which a given place-type requires, and then examine every place of that type in the university, to see whether it has the required pattern. Since we are concerned with the global organization of repair, it is not essential that the analysis be too detailed - in fact when a diagnosis is made too precise it leads to certain unavoidable ambiguities. To some "ideal" extent, a given pattern will always be missing from any given place - no place is ever perfect - and it would be fruitless to record all instances of this type, since there will never be enough money to correct them all. Instead, the diagnosis is painted with a broad brush, and identifies the major deficiencies of each place-type, for the places where they occur.

For example, the diagnosis for departments, says the following:

"The patterns which a Department must have in order to be in balance, are: Department size, Fabric of departments, Department space standards, and Department hearth. In the University of Oregon, in 1971, we note that six departments are too large, according to Department size, that eight departments are too scattered according to Fabric of departments, that nine departments are in urgent need of space, according to Department space standards, and that all departments except two are missing the Department hearth pattern".

Given this diagnosis, it is possible to outline a broad policy of growth and change, which would be needed to repair the damage indicated in the diagnosis. We can say, for example, that those departments which are too large should be split in half, that those departments which are too scattered should be consolidated, that those which have too little space need more space, and that those without a hearth need to be modified.

It is always possible to express these recommendations in the form of a map, which has five colors: White, yellow, orange, red and brown. Yellow means "leave it as it is"; Orange means "modify"; Red means "add more space of this type"; Brown means "take away this space"; White means "not relevant".

For example, in the map for the departments, the departments themselves are always either colored yellow, orange, red or brown; every other kind of place - roads, parking, paths, green places, etc. - are colored white. Among the departments, we color yellow those which need no improvement of any kind; we color orange those which need minor modifications (for example, the addition of a department hearth); we color red those which need additional space added to them; and we collor brown those parts of departments which are so far from the rest of their department, that they violate the Fabric of departments pattern, and must be turned over to some other use.

Each map must be supplemented by a series of temporary policies. These policies define the administrative steps which must be taken to make possible the growth and repair which the the map defines. The policies vary in their scope. One policy defines the amount of land purchase necessary, over the next ten year period, to maintain adequate land area for the given student population. Another policy defines the general areas where student gathering places may appropriately be built; another defines the form of building construction which will most easily solve the patterns required by university buildings.

Policies differ from patterns, since they are specific to the present arrangement of buildings and open land, and above all, because they are temporary. Since the policies are formulated in response to a given diagnosis, they must always be formulated anew, every two years, for every new diagnosis.

Each map, with it supplementary policies, defines a crude repair field, which does for the university, what the endocrine fields do for an organism. We propose that these maps be used, like the endocrine fields, to control the overall distribution of growth and repair of a given place-type. The nineteen maps, acting together, will control all growth and repair within the university.

Superficially, these maps may seem to be like a conventional master plan. There is, however, a great difference. The master plan tells us what to do, in order to create a certain future. The repair maps tell us what is out of balance, now, and what must be done to correct it - and they change constantly, as the university changes. And of course, they put far less constraint on the imagination of the individual user groups, than a conventional master plan.

Let us see, now, how an individual user group can create a project, within the repair fields, in such a way that it becomes unified with the fabric which is already there.

2. <u>Local repair according to the diagnosis</u>.

Let us suppose that the user projects will not be funded unless they are consistent with the current diagnosis, as shown on the repair maps, and that the user groups know this. We can be sure, then, that the projects brought forward by the user groups will not be haphazard, but will indeed be for the good of the whole, and a global order will slowly emerge from the cooperation of these projects

We still face the possibility, that, at the local level, a project put forward by a user group is insensitive to its immediate surroundings, because it does not fit together with what is already there. Thus, we could have a situation where the overall distribution of buildings and activities do display global order (at the scale shown by a land use map), but that locally, the buildings, paths, and outdoor areas still do not fit together to form a coherent environment - but are instead, at that level, still a collection of fragments.

To understand this problem, consider the usual way of starting a new project at a university. Take, for example, the current proposal for a new School of Education at the University of Oregon, intended to replace the existing buildings, which are too small.

In this proposal both the new places, and the old, are to be ruined.

The new buildings are to be dropped, like bombs, into the unsuspecting landscape, with no regard for the areas around them, and no regard for the new places which will be created when they are built, between them and the surrounding buildings and outdoor places.

And the old buildings - the places where the School of Education functions now - will in the end simply have their present use pulled out of them, and some of the buildings torn down; the gaping wound where these uses are to be pulled out will not be treated at all, but simply left as "extra available space".

This approach is bad for the environment at both ends. It is bad for the areas around the new place which is built; and it is bad for the areas around the old place. Mistakes of this kind happen because people see "space" as an abstract commodity, like money, which can be measured by its amount, and torn down and built up without regard for its relationships. To avoid these mistakes it is essential to see that when there is too little space for education, it is the university environment as a whole which is failing, and that it is the environment as a whole, which must be repaired.

We must, therefore, formulate the problem of providing new space, as a problem of repairing the environment in such a way that the repairs improve both the old place, and the new. The key to all this is already contained in the discussions of Chapter 2, on balanced use. We stated there, as our fundamental axiom, that an environment is good only when every single place which it contains, large or small, is itself in balance

The policy which follows from this axiom, and from the attempt to treat the environment as a whole, is this. When a place goes out of balance (the College of Education, in our example), then the environment must be repaired in such a way that all the places affected by the repair (all the places near the existing college, and all the places near any proposed additions) must, at the end of this repair, all be in better balance than they are now.

In short, we will not allow any changes in the environment to have the effect that some places are brought into balance, at the expense of other places which are brought out of balance. Repair will be allowed, only when it improves all the places affected.

What does this mean in practice. It means that the OFFICES, OUTDOOR PLACES, PATHS, PARKING, STUDENT HOUSING ATHLETICS, STUDENT GATHERING PLACES, and so on, in or near the existing School of Education will all be more in balance (will have more of the requisite patterns) than before the repair, and that all the OFFICES, OUTDOOR PLACES, PATHS, etc., associated with any new buildings, will also be in better balance than they are now.

The procedure which will guarantee this result, is described in full in Chapter 9. We start with the notion that it is a place of the type DEPARTMENT, which is out of balance. The scheme on page 00 tells us that we cannot bring a DEPARTMENT into balance without also bringing all its associated PUBLIC BUILDINGS, STUDENT HOUSING, PARKING, ROADS, PATHS, LIBRARIES, ATHLETICS, CAFES, FACULTY OFFICES, STUDENT WORKPLACES into balance. We then go through the task of design, taking these place-types one at a time, and re-arranging the corresponding places according to their associated patterns. In the course of this task, we shall, for example, be forced to create student housing within a reasonable distance to satisfy Living woven into learning; bicycle paths to satisfy Bike paths and racks;

arcades and connected open space between buildings to satisfy Convex connected open space and Territorial ambiguity; parking lots to satisfy Commuter parking; classrooms to be used by the entire university community to satisfy Classroom distribution; cafes or student lounges to satisfy No isolated student union; athletic courts and saunas to satisfy Relax, leisure is a part of learning.

We do not, of course, allow this process to extend outward indefinitely. We cannot provide parking for the entire campus, when we are designing the education buildings; nor can we make all the open space on campus convex and connected. But in each case we can make a piecemeal effort to increase the presence of each pattern in the local environment. We can make convex connected open spaces around the buildings, reaching out toward the neighborhing buildings; we can place a student coffee lounge in a realm between education and a neighboring department; we can create a bike route that will eventually join up with other bike routes to create a whole network.

And now consider all these new places which we have created: classrooms, outdoor places, pedestrian paths, local roads, parking, athletics, student gathering places. To follow our policy strictly, each one of these places which we have created, must now itself, be brought into balance - which means that each one of these places in turn, must satisfy the patterns that apply to it. Making sure that this is in fact so, our concern will ripple out once again. We shall be forced to examine the relationship between each of these places, and its neighbors; and, perhaps to create still other, new places which are required in turn. Of course, this process of rippling outward comes to a halt sooner or later; but in the process, we have created a vast fabric of relationships between the place that we have modified, and the places all around it. It is precisely this web of relationships which finally creates the global order we are looking for.

1. SIZE OF PROJECTS

LARGE VERSUS SMALL

	Large	Small	
a.	Requires allocation to few areas of campus at any given time	Allows allocation to many areas of campus at any given time	"Large" project could be passed in many small increments
b.	Lumpy growth model does not reflect actual needs. Most of time facilities out of balance with need.	Incremental growth model does reflect actual needs. Most of time facilities are in balance	
c.	Necessitates radical dislocations vs large numbers of people more dispersed from one location to another.	Minimizes serious dislocation.	
d.	Necessitates substantial remodeling as vacated sphere is converted to new users.	Minimizes the need for serious remodeling since there would be very little relocation - remodeling would occur gradually as needed to update receivers only.	
e.	Delivers a lower rate of return/$ invested in building.	Delivers highest rate of return (assignable sq.ft.) per $ invested	Scale / model
f.	Few resources for remodelling causes facilities to become increasingly obsolete; leads to (erroneously) feeling that existing facilities should be abandoned in favor of totally new ones; lack of interest in maintaining	Adequate resources for remodelling and small additions as need arises continually corrects obsolescence. Leads to feeling that existing facilities should be properly maintained; people grow attached to their place.	

	existing facilities; only source of relief is new building; in fact let facilities run down to justify new ones. Leads ultimately to complete decay of facilities.	
g.	Has large (time) lag factor between conception and execution. 1. One is always behind scheduled demands for space; 2. Inflation increases costs during lag period.	Lag time reduced to minimum in between conception and execution. Meets scheduled demands for space. Minimum cost increases from inflation.
h.	Less manageable, more susceptible to large errors	More unmanageable, less suscept to large errors.
i.	Discourages user participation in design process.	Encourages or at least permits user participation in design process.

CHAPTER SIX: ADMINISTRATIVE PROCESSES

We are now ready, finally, to describe the administrative processes which will be required to make all the foregoing possible.

1. Organization

We propose that the process of development shall always involve four kinds of groups:

a. The groups who initiate projects, which we call the project teams. As we shall see below, literally any user group on campus, who find their part of the environment unsatisfactory, may form a project team.

b. A committee which represents students, faculty and administration - which, at the University of Oregon is currently called the Campus Planning Committee (CPC). The existing Campus Planning Committee should be redefined so that it is clearly understood as the representative of the users on the campus, and they must have enough power to make the key decisions concerning projects and the allocation of funds. [Note: The committee should, as it does now, act to advise the President, with the understanding that the President will carry out their recommendations, except in highly unusual cases. Members of the committee need to be appointed for longer terms than they are today - we suggest a term of at least three years - and the terms should be overlapping.]

c. The office of planning on the campus, which at the University of Oregon is currently called the OPIR. This is a group of trained architects and planners, who will help the project teams to initiate their projects, who will play a major role in the creation of the capital construction list, as they do today, and who will help project teams undertake the schematic design of their proposed projects. [Note: The OPIR at the University of Oregon in its present form cannot cope with all these jobs: it must be re-organized to include the campus architect, whatever staff are necessary to help the project teams, and that part of physical plant which is responsible for large scale repair. This new version of a OPIR will, in fact, be responsible for all capital construction on campus, including all phases of planning, building, and reconstruction.]

d. The group of top level decision makers, which includes, at the University of Oregon, the President of the University, the State Board of Higher Education, and the Ways and Means Committee of the State Legislature.

2. Processes

We now turn to the processes. There are five. They are:

A. Adoption of the patterns.
B. Biennial diagnosis of the current state of the university.
C. Initiation of projects.
D. Allocation of resources.
E. Design and construction.

We discuss them one by one.

A. Adoption of the patterns

In Chapter 7, we shall describe a number of patterns which we consider essential to the health of the university. However, although these patterns are in large part based on empirical findings, they are nevertheless still open to disagreement. If the users of the university are to rely on the patterns as guidelines, during the process of design, they must have full confidence in the patterns, and they must therefore have the chance to iron out their disagreements. Further, whatever agreement is reached, must be campus-wide; it is not enough for isolated individuals to agree or disagre with the patterns. Finally, just because the patterns are based on empirical findings, it is certain that over time, the patterns will need to change, as our knowledge about the environment and its effects changes.

For all these reasons, it is necessary that the patterns for the university by formally adopted by the campus community, in a way that is always open to review and improvement.

We propose that the patterns be formulated by OPIR, and adopted by the Campus Planning Committee (CPC), on behalf of the university community; and that any proposed changes in these patterns, must then, themselves always be adopted by the CPC.

Under this system, there is always, at any given moment, a current set of patterns which are considered "adopted" by the university, but these patterns are always open to review. To make sure that the patterns do not stagnate, and to make them sensitive to changes in knowledge, we propose that the CPC be <u>required</u> to review the patterns, at least once a year, with the idea of making any changes that are necessary; and that members of the campus community who are dissatisfied with the current patterns, can make alternative proposals at that time.

Since the patterns will have a very strong impact on people's actions, it is essential that the CPC reflect campus-wide sentiment as accurately as possible. To this end, we propose that all patterns, or changes in patterns, shall be published in the Campus Newspaper, the Emerald, at least one month before adoption by the CPC - so that people who wish to raise objections can do so, either by letter, or by appearing in person at the CPC meeting.

B. <u>Biennial diagnosis of the current state of the university</u>

We propose that the OPIR make a diagnosis of the kind illustrated in Chapter 8, every two years. In later bienna, this will simply mean bringing the previous diagnosis up to date. Every two years OPIR will present their latest diagnosis to the CPC for formal adoption, and will make any changes required by CPC, prior to adoption.

CPC will then rank order the policies, to provide the campus community with a public, and clearly visible, assessment of priorities, which can guide the individual projects. It will be understood that projects which are submitted to CPC will be accepted or rejected, and given their priority on the capital construction list, according to their degree of conformity to these policies and diagnoses, and their order of priority.

<u>It must be clearly understood that the diagnosis and policies are themselves based on the patterns.</u> In this sense, they are not adding anything new to the framework already provided by the patterns. However, the diagnosis and policies, reflect the current situation on campus, and make it clear <u>how</u> these patterns can best be implemented, on the campus, given its <u>current</u> condition. It also gives the OPIR and the CPC an opportunity to express their understanding of the relative urgency in a way which will influence individual projects - both at the time of their creation, and during the assignment of priorities.

C. Initiation of projects

The first principle of initiation is this. Any group of people on the campus, may propose a project. It is important to understand this principle, and to recognize that it is rather different from the process of initiation which is in practice today. A "group" may be a group of students in a dorm; it may be the ad hoc group for preservation and development of the mill race pond; it may be the Department of Anthropology; it may be a pair of departments; it may be the junior faculty and Ph.D. students in the Department of Music; it may be a half dozen people who believe that flowers should be planted along public paths; it may be a group of secretaries who want to improve their work place.

It is not necessary to put any constraints on the groups who may initiate projects, because projects will be judged and funded according to their merits, and the benefit they do to the campus as a whole. In particular, many groups may form on an hoc basis, precisely in order to initiate a project. We call any such group a "project team".

To initiate a project, the project team must put together a project proposal, with the help of the OPIR staff; and then submit the project to the CPC. This project proposal must always have the format illustrated in Chapter 9. This means in particular, that it contains the following items:

1. A statement and analysis of the place on campus deemed unsatisfactory.
2. An analysis of the patterns which are missing from the place in question, and an explanation of how these and other appropriate patterns can be brought into play.
3. A drawing, at 1/16 scale, showing the general position of the proposed building (or open space, etc.), on the campus.

4. An approximate cost for the project.

The campus planning committee, and other user groups, will later have to decide the relative importance of different projects. It is therefore essential that each project proposal be formulated in a way which shows, quite clearly, how, and to what extent, that project contributes to the overall balance of the university. To this end we require that each project proposal follow the rules of presentation laid out in Chapter 9, exactly. These rules are constructed to show relative strengths and weaknesses of any given project, precisely and explicitly.

D. Allocating resources

Suppose that in a given biennium, one hundred projects are submitted to the Campus Planning Committee. Which of these projects should be funded? How much money should be given to the projects which are funded? How are the projects to be ordered?

We propose that the Campus Planning Committee make these decisions in a manner which relies to a great extent on the project groups themselves.

We wish to stress that it would be highly inadvisable, in our opinion, for the priorities to be decided from "above", either by university administrators, or by the CPC acting alone. The schism between the people who request funds for projects, and the people who allocate the funds, widely regarded as an essential administrative practice, only contributes to the alienation and non-responsibility of the users - and above all forces each user group to focus exclusively on their own needs, and to be oblivious to other peoples needs. It fails completely to give people any balanced sense of the relative importance of their own project and other projects.

The only way to assure real participation in the planning process is to require the users who submit projects for consideration to decide <u>for themselves</u> which projects are most urgent

Only in this way can we be assured that people will be satisfied with allocation decisions. They will be satisfied with these decisions if they make them themselves, if they themselves have to confront the harsh reality of limited resources and urgent needs. In the current allocation system, all participants feel that they have been betrayed and that others have taken advantage of them. We stress the notion of "others" or "them" as central to this malay. The only healthy way to treat this problem is to invest the decisions on allocation in the people themselves.

In order to involve user groups actively in the process of ordering projects, we propose that the CPC hold hearings, once every two years, in which all those groups which have submitted proposals will participate, both as <u>advocates</u> of their own proposals, and as a <u>jury</u> to decide on a list of priorities and a level of funding for each project. The CPC will conduct these hearings in a manner analogous to that of <u>judges</u>. Members of the committee will ask advocates to explain the merits of their proposal, the application of patterns, the upgrading of places into balanced use, the contribution of the project to the university as a whole and any other information which may throw light on the desirability of the project.

At the end of the hearings, each participant group will be requested to order all the projects in a list of priorities. The lists of all participatns will then be combined by majority rule (if a majority prefers project A to project B then A is preferred to B, and so on, for all pairs of projects. When the majority decision is inconsistent, the inconsistency will be ironed out by requesting participatns to deal specifically with the conflicting pairs, i.e., if the majority prefers A to B, B to C and C to A, people will be asked to order the three again until the inconsistency is ironed out.) This kind of ordering of priorities <u>only involves</u>

comparison between pairs of projects and can be done by laymen without difficulty.

The CPC will submit the combined order of priorities to the President for his approval. If he approves it, it will then be submitted to the State Board of Higher Education.

E. Design and construction

Once a project has been adopted by the CPC, and placed on the list of projects for the State Board, it will be necessary for the President, acting on the advice of the CPC, to appoint a project team, which will carry out the final schematic design and cost estimator, that is to be submitted to the State Board for funding. This final project team may be different in composition from the original project team, if the original project team did not contain enough people to represent the users of the proposed project in a balanced way. However, the new project team must always contain the leaders of the original project team. Most important of all, the formal project team may in no case have more than six persons in it. We have found that large groups cannot work together successfully to design a building.

The formal project team will complete the schematic design for their project, with the help of staff members from OPIR, but without the help of outside professional architects. This is a departure from normal practice. In normal practice, the university would hire an architect to do the schematic designs. However, to encourage participation in the design, we recommend that the project teams be given the job of doing the schematic design, together with the staff members of OPIR, and that no professional architects be hired until the project has actually received funds from the State Board and the Legislature.

The possibility of a group of lay people designing a building for themselves, hinges on the use of the pattern language: a system of patterns similar to the one given in Chapter 6, but much more extensive, containing detailed information about the interior design of buildings and open spaces, and organized to allow any lay person to design buildings for himself. This pattern language is available from the Center for Environmental Structure, and is undergoing constant development. Since the use of the pattern language requires some training, we suggest that, for the first few years at least, the Center might undertake the responsibility of training staff members of OPIR and the project teams.

The schematic design prepared by the project team and OPIR, will then go forward to the State Board and to the Legislature, as an item on the Biennial budget request. Only when (and if) the project is funded, will a professional architect come onto the job. This architect will be required to follow the schematic design, as given; and will not be allowed to introduce any arbitrary changes based on his own tastes.

A final word about construction. One of the very destructive aspects of recent university building in Oregon, has been the gratuitous variety of the different building types. One architect builds steel X-frames; another builds reinforced brickwork; another uses wood construction; another reinforced concrete shells. This variety has been regarded as a positive expression of freedom and democracy. In fact it is nothing of the sort. It merely expresses the fact that none of the architects have any particularly good reasons for choosing the building systems they have chosen, with the result that the university has lost any kind of consistent structural vernacular.

The pattern language which we shall make available to project teams, will include specific patterns about construction and materials. This means that in the future, the university will be unified not only by the global patterns which define its emerging plan, but also by consistent principles of construction and materials.

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CHAPTER 7: PATTERNS

CAMPUS	University size University shape and diameter Town integrated with university University as a marketplace	DEPARTMENT, STUDENT HOUSING, ADMINISTRATION, OUTDOOR PLACES, LOCAL ROADS, PARKING
DEPARTMENT	Department size Department space standards Fabric of departments Living woven into learning University as a marketplace Department hearth	PUBLIC BUILDING, PARKING, STUDENT GATHERING, CLASSROOM, FACULTY OFFICES, STUDENT WORKPLACES
STUDENT HOUSING	Students close to campus Living woven into learning Student household mix Student community size Private access to each apartment Kitchen clusters	DEPARTMENT, OUTDOOR PLACE, LOCAL ROADS, PARKING, PEDESTRIAN PATHS, BIKE PATHS
ADMINISTRATION	Administration decentralized Small services without red tape Proximity analysis	PUBLIC BUILDING, PARKING, FACULTY OFFICES
PUBLIC BUILDING	Human scale in public buildings Buildings shaped for light Horizontal office communication Feeling of shelter Social spaces define structure	OUTDOOR PLACES, LOCAL ROADS, PEDESTRIAN PATHS, ENTRANCE, CORRIDORS
PARKING	University parking Nine percent parking Cars surround pedestrian islands Parking structures Short term parking Tiny parking lots	LOCAL ROADS, OUTDOOR PLACES
LOCAL ROADS	Looped local roads Cars surround pedestrian islands Cruising loop T-junctions Paths interrupt roads	PARKING, PEDESTRIAN PATHS, BIKE PATHS

Draft

OUTDOOR PLACES	Access to a green Convex connected spaces South facing open space Small open spaces Patios which live Trees must stay Places at the edge of buildings	PEDESTRIAN PATHS
PEDESTRIAN PATHS	Cars surround pedestrian islands Territorial ambiguity University as a marketplace Paths interrupt roads Centripetal pedestrian paths Ample street lighting	BIKE PATHS, STUDENT GATHERING, ENTRANCES, CORRIDORS
BIKE PATHS	Bike paths and racks	
STUDENT GATHERING	Activity nuclei No isolated student union Realms between departments	PEDESTRIAN PATHS, CAFES AND SHOPS, LIBRARIES, SPORTS
CAFES AND SHOPS	Town integrated with university Real learning in cafes Activity nuclei	
SPORTS	Relax: leisure is a part of learning Activity nuclei	
LIBRARIES	Campus library decentralized Activity nuclei Stacks and carrels integrated	
CLASSROOMS	Classroom size and distribution University as a marketplace Seats outside meeting rooms	FACULTY OFFICES
FACULTY OFFICES	Students near faculty offices University as a marketplace Primary groups among students and faculty Light on two sides of every room Thick walls	CLASSROOMS, STUDENT WORKPLACES

Draft

STUDENT WORKPLACES	A workplace for every student Primary groups among students Students near faculty offices Light on two sides of every room Thick walls	STUDENT GATHERING, SPORTS, LIBRARIES, FACULTY OFFICES
ENTRANCES	Entrance location Circulation realms Territorial ambiguity Bike paths and racks Entrance shape	BIKE PATHS
CORRIDORS	Short corridors Circulation realms Territorial ambiguity Corridors which live	STUDENT GATHERING

Draft

DRAFT

UNIVERSITY SIZE

If a university is too small it suffers from lack of variety; if it is too large, it no longer works as a human organization; if it grows too fast, it breaks down because it doesn't have the chance to absorb or adjust to change.

Many people share the intuitive feeling that giant universities are too impersonal and bureaucratic to allow learning or research the freedom they need. At the other extreme, very small universities also seem to fail, somehow - perhaps because they have not reached a critical mass in some respect, and cannot provide the richness of faculty, students and research projects, which are needed to create a good atmosphere for learning. The question is: Can these rather vague intuitions be made more precise? Can we give any estimates of the critical size a university must have, in order to function well, or of the size at which a university becomes "too big"?

To answer this question, we must first choose a measure of university excellence. We were unable to discover any existing system or report measuring the quality of universities as institutions. However, we found the American Council of Education's A Rating of Graduate Programs to be a starting point to make comparisons of probable indices of quality of universities. Two surveys have been made by the A.C.E. -- one in 1966 and one in 1969. The A.C.E. ratings are based on a nationwide survey of university graduate facilities by discipline. The surveys were completed by faculty members in institutions that had awarded at least 100 doctorates in two or more disciplines in the most recent ten-year period for which doctoral data were available, 1957-1967.

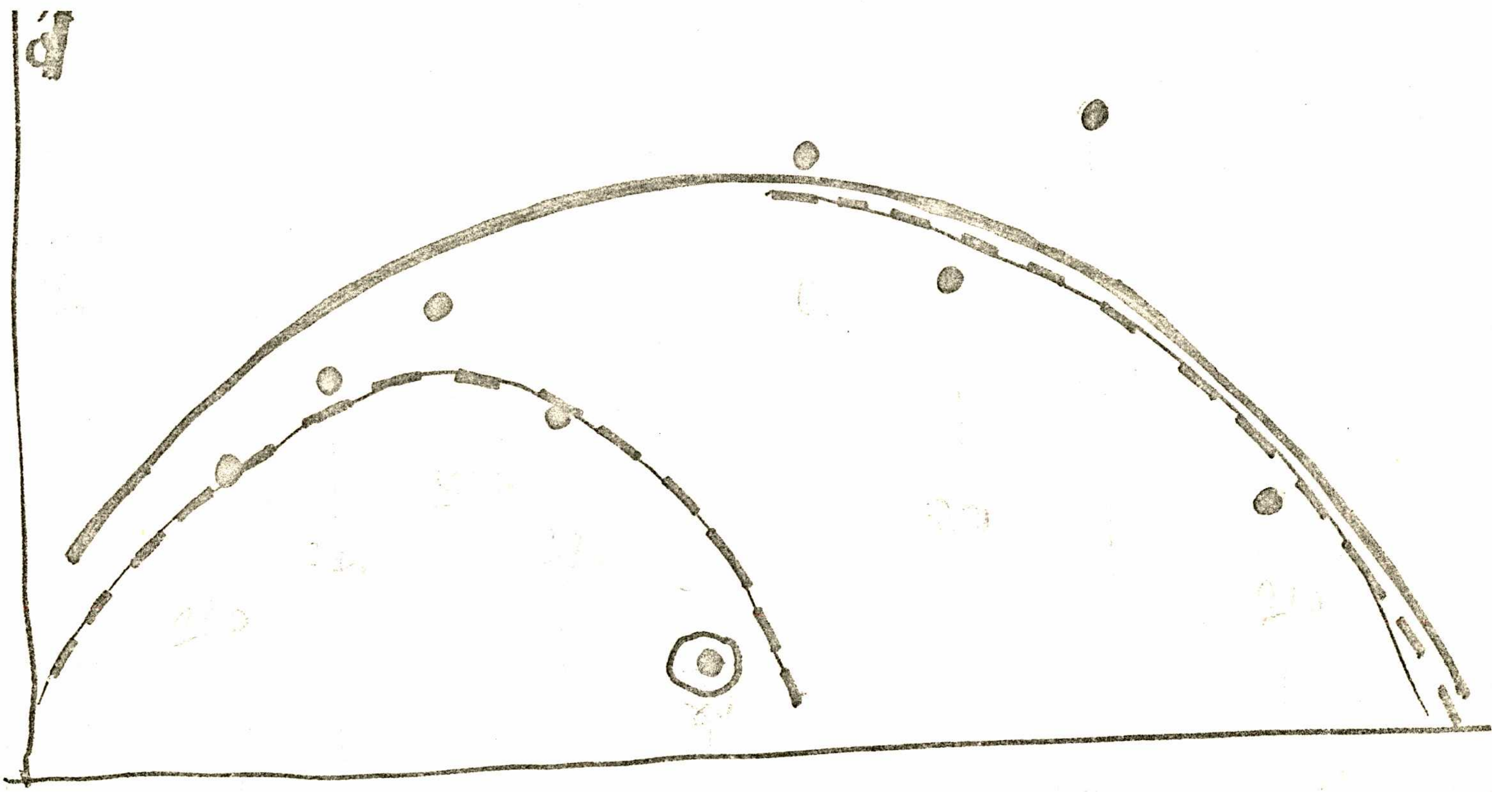
Three things were rated for each department listed: 1. Quality of graduate faculty; 2. Effectiveness of doctoral program; and 3. Change in the last five years. The "Quality" and "Effectiveness" ratings were so highly correlated (.99 in most disciplines) that it is not necessary to consider them separately. In the published report, number of votes cast was given only for "Quality of graduate faculty."

In order to construct a measure of institutional excellence we tabulated the faculty ratings for 16 key disciplines which would normally be found in any balanced university. In the 16 disciplines selected there were 55 institutions which had at least one discipline rated as "Distinguished and Strong". Totaling all votes cast for each of the 16 disciplines in each of the institutions gives a rough measure of total institutional excellence. The total score thus obtained ranges from 1279 (Berkeley) to 8 (Yeshiva). (Note that this index is therefore biased towards graduate education. It is possible that a measure, chosen to reflect the quality of undergraduate teaching, might show different results.)

	TOTAL NO. OF POINTS	NO. OF PROG. TOP TEN RANKINGS	Phy. Sciences					Soc. Sciences							Humanities				
			D. Biology	Chemistry	Geology	Mathematics	Physics	Anthropology	Economics	Geography	History	Political Sci.	Psychology	Sociology	English	French	Philosophy	Spanish	Enrollment
Berkeley	1279	(16)	66	90	79	91	89	87	86	70	84	88	79	91	83	56	60	80	(28,132)
Harvard	1244	(15)	54	93	82	90	90	74	97		94	86	70	91	91	62	87	83	(14,641)
Yale	1089	(12)	58	65	78	77	65	69	90		93	91	62	43	91	93	58	55	(8,551)
Chicago	1073	(14)	48	64	45	86	68	93	95	88	76	83	34	86	69	53	53	32	(8,591)
Wisconsin	997	(9)	63	74	45	78	55	32	63	74	81	71	64	80	57	58	33	69	(34,670)
Michigan	964	(9)	25	35	35	68	49	86	66	74	73	78	79	84	43	40	80	49	(35,242)
Stanford	949	(12)	61	82	74	79	79	59	64		78	73	78	37	65	49	42	29	(11,557)
Princeton	899	(10)	28	62	72	91	86		82		84	66	25	48	60	62	87	46	(3,227)
Columbia	847	(10)		73	54	67	72	60	50		80	48	29	83	70	70	54	37	(16,777)
U.C.L.A.	741	(8)		73	66	54	32	63	41	43	50	38	61	51	44	26	49	50	(26,859)
Cornell	662	(8)	26	74		59	74	54	21		61	39	30	51	58	44	71		(14,638)
M.I.T.	622	(7)	48	87	75	85	87		91			71	36				42		(7,850)
Illinois	599	(4)	28	80	30	61	75	47			36	20	67		48	37	23	47	(32,759)
Johns Hopkins	520	(3)	50	18	36	26	17		31	24	56	21	35	47	59	40	32	28	(2,260)
Penn.	488	(4)	19			36	47	77	62		42		60	20	39	34		52	(19,020)
Minnesota	469	(3)		36	30	35	28		65	70	29	38	58	35	21		24		(43,000)
Northwestern	428			50	42	23		28	52	47	41	35	33	46	31				(16,259)
Indiana	374	(1)	40	33		17					46	36	42	23	52	43		42	(29,308)
Wash. (Seattle)	363	(1)	52	22		40	25	29		58	29		17	36	39	16			(32,749)
Texas	362	(1)	26	40	49		12				22		48	23	21	22	42	57	(35,678)
Cal. Tech.	361	(4)	65	86	81	41	88												(1,537)
Brown	332		15	14	24	42	16		20		35		39		28	19	44	36	(5,495)
No. Carolina	265	(2)									40	61	22	67	44	31			(16,430)
Rochester	202			15			39		31		15	31	26		18		27		(5,208)
Cal. (San Diego)	176		43	33	32	16	52											30	(4,838)
Brandeis	175		32	16		42	13				31			24	17				(2,972)
Duke	148						18				35		24		28	17		26	(8,166)
Penn. State	148	(1)		20	50					48			30						(26,823)

			Env. Sciences					Soc. Sciences							Humanities				
			D. Biology	Chemistry	Geology	Mathematics	Physics	Anthropology	Economics	Geography	History	Political Sci.	Psychology	Sociology	English	French	Philosophy	Spanish	Enrollment
New York Univ.	142	(1)				67							16		28	31			(44,401)
Purdue	128		31	48		29	20												(25,037)
Rockefeller	123	(1)	55	17		22	29												(130)
Iowa	121									33		30	30		28				(20,236)
Ohio State	118	(1)		40						59			19						(45,099)
Virginia	113	(1)	12			21					26				54				(9,723)
Pittsburgh	110	(1)						33									77		(24,554)
Colorado	99		28	18			14						39						(20,387)
Carnegie-Mellon	90			18			20		39				13						(5,254)
*Oregon	86		24	15								26	21						(14,665)
Michigan State	84			23									29	32					(40,820)
owa State	54			41			13												(19,172)
Syracuse	54	(1)								54									(16,795)
Maryland	47						47												(32,444)
Kansas	46									46									(19,000)
Wash. (St. Louis)	45		30									15							(11,257)
Case Western	44		24	20															(9,951)
Rice	44			18	26														(3,163)
Arizona	41							41											(24,726)
Buffalo (SUNY)	33														33				(22,629)
Cal. (Davis)	30		30																(12,594)
Clark	27									27									(2,149)
Florida State	20			20															(17,010)
Claremont	14														14				(1,151)
Florida	14			14															(21,156)
tre Dame	14			14															(6,194)
Yeshiva	8		8																(8,000)

The following graph presents the connection between excellence as measured by the A.C.E. rating, and total student enrollment:



University student population

As we can see, there are two possible ways to interpret this graph. If we interpret it in the manner described by the dotted curve, we have an unaccountable discontinuity between 20-25,000 and 25-30,000, which seems implausible. It is more plausible to assume that there is an aberration in the data, for that interval, and that the curve is in fact smooth, as shown by the solid curve.

If we accept the solid curve as the best fit to the data, we may then say that excellence does depend on size: It reaches a maximum for universities whose population is in the 20,000 - 30,000 range, and then falls off again. This would suggest that up to about 20,000 students, the bad effects of size are counterbalanced by the benefits of variety, but that size begins to overwhelm the benefits of variety beyond about 30,000.

There is a second, and altogether different way of explaining the poor quality of very large universities: they are poor, not because their size has made them poor, but because they have grown too fast (on the grounds that their institutions are poorly adapted to needs, because their has been too little time for adaptation). To test this hypothesis, we compare the growth rates for the same 55 universities during the periods 1939-1953, and 1953-1969, with the A.C.E. measure of excellence for 1969. The results are presented in the following table:

Table.

~~GROWTH RATE TOTALS~~

I. All Institutions

A. Institutions with more than 800 points.* (9 institutions)

		1939	1953	1969
1.	Total students	106,861	109,995	161,438
2.	Average size of institution	11,873	12,222	17,937
3.	Average rate of growth per year		0.209%	2.92%

B. Institutions with 200 - 800 points.* (15 institutions)
(The 1939 enrollment figure for UCLA is unknown)

		1939	1953	1969
1.	Total students	119,311	153,643	289,050
2.	Average size of institution	7,954	10,243	19,270
3.	Average rate of growth per year		2.05%	5.51%

C. Institutions with 1 - 200 points.* (31 institutions--Case Tech. and Western Reserve counted as one. 1939 enrollment figure for U.C., Davis is unknown.)

		1939	1953	1969
1.	Total students	187,141	247,245	520,496
2.	Average size of institution	6,037	8,847	16,790
3.	Average rate of growth per year		3.32%	5.61%

Without New York Univeristy the totals are:**

		1939	1953	1969
1.	Total students	139,370	209,857	476,095
2.	Average size of institution	4,646	6,995	15,890
3.	Average rate of growth per year		3.61%	7.93%

*The system of points used here is the same as used in the ratings of institutions--the American Council of Education's A Rating of Graduate Programs.

**New York University was removed because its growth pattern and large enrollment significantly affect the totals.

The table shows clearly that excellence and growth rate are correlated. It is hard to establish a definite optimum or maximum for the growth rate, since growth in 1939-53 was so different from growth in 1953-69. However, we may confidently infer, from the data, that any university which has growth rate of much more than 2% per year, is likely to run into trouble.

We have found correlations between size and excellence, and between growth rate and excellence. It is always possible to dismiss correlations of this kind, on the grounds that they are merely by-products of other correlations, or on the grounds that it is the excellence which creates changes in size and growth rate, not vice-versa. However, there seems no basis for doubts of that kind, in this particular case, and it is most reasonable to assume, as the correlations suggest, that size and growth rate <u>do have an effect</u> on excellence.

Therefore: <u>Limit the growth rate of any university to a rate of 2% per year, and limit the absolute size of any university to 25,000 students</u>.

There is one important additional note. The measure of excellence which we have used, is based on graduate teaching. It is very likely that graduate teaching does better in large institutions, since it relies on the variety of professors and research, more than on the quality of classes. It is therefore possible that a careful examination of the connection between excellence of <u>undergraduate</u> teaching and university size, may show that the ceiling should be as low as 15,000. We have, so far, been unable to find any evidence for this conjecture, but it remains an open possibility.

DRAFT

UNIVERSITY SHAPE AND DIAMETER

When a university is too spread out, people cannot make use of all it offers; on the other hand, a diameter for the university based strictly on the 10 minute class break is needlessly restrictive.

The patterns Town-Integrated with Campus and Living Woven into Learning, describe the need to mix academic functions with parts of the town, and with student housing. Thus they imply that the diameter within which campus activities are located be as large as possible. This pattern attempts to answer the question, how large can the diameter be before parts of the university become lost to its users?

There are two diameters at stake:

1. The diameter of a zone within which all classes must be located, given the ten minute class break; and

2. A larger diameter within which all university functions must be located if they are to be truly accessible to the university community at large.

We take these two questions separately:

Diameter for classrooms:

It is commonly assumed that all academic buildings on a campus must be within 10 minutes walk of each other (see, for example, Anton Egner, "How Big Can You Get", College and University Business, Vol. 37, No. 5, November 1964). This assumption imposes a very small diameter a high density, and a maximum student enrollment on the campus. Yet the assumption is based on one isolated fact - the fact that classes happen to be scheduled with a 10 minute interval between them. As Egner has pointed out, it seems impractical to change this feature of scheduling. However, the fact that such relatively massive constraints follow from such a relatively isolated and unimportant fact, at least requires closer examination of the logic behind the concept of a 10 minute diameter.

Let us start with a different configuration: and try to understand its functional consequences. Imagine that the classrooms of the university are uniformly distributed, over a circle whose radius diameter is 15 minutes - and that non-classroom buildings are even further out. How often will students be inconvenienced by this more open distribution?

We start with a mathematical observation. If we have a uniform distribution of points within a circle of diameter 15 minutes, then 82% of the point pairs will be less than 10 minutes apart. This follows from the general rule that the proportion of points which are less than x apart, in a circle of radius R, is given by the function

$$p(x,R) = \frac{1}{\pi R^2} \quad \pi x^2 + (R^2 - x^2)\ (\pi - 2\theta) - \tfrac{1}{2}\ (2R^2 + x^2)\sin 2\theta$$

$$\text{where } \theta = \cos^{-1} x/2R$$

(M. G. Kendall and P.A.P. Moran, Geometrical Probability, London, 1963, p. 42.) In other words, even when we double the classroom area, by increasing its diameter from 10 to 15 minutes, only 18% of the trips taken within this larger circle will be longer than 10 minutes.

Notice also, that the classes which a student takes during the day, by no means always follow on one another's heels. Yet it is only in these cases - i.e., when one class finishes at 11:00 a.m., and that same persons next class starts at 11;10 a.m., that the 10 minute distance is even an issue. We estimate that on the average, a student has no more than four of these "on-the-heels" moments in his class schedule, for any given week.

When we put these two observations together, we realize that on a 15 minute campus, a student would, on average have four "on-the-heels" class connections per week, and that only 18% of these, i.e. 0.72 of them, would be so far apart that it takes more than 10 minutes to walk between them. In short, in a university whose classrooms fall within a 15 minute circle, we should expect students to be a couple of minutes late, once a week. This is hardly serious. It seems that the 10 minute constraints has been exaggerated in the literature. We propose that classrooms be uniformally distributed within a 15 minute diameter circle.

The Larger Diameter for All University Functions:

The location of non-class activities such as athletic fields, administrative services, research offices, student health services, etc., are not constrained by the 10 minute class break. These places are used when people have at least an hour or two between classes, or when they are through with classes for the day. They need only be close enough so that one can comfortably walk to them from any point on campus. Reliance on vehicles of any kind will not do because:

1. University diameter based on the assumption that people can bike around campus automatically closes off parts of the university to non-bike riders - in American culture, bike riding is unlikely to be anywhere near universal. Our observations of large campuses which specially accommodate and encourage bicycle riding where bicycles are in fact very common (U.C. Davis and U.C. Santa Cruz, for example) indicate that as much as 30 or 40 percent of the campus population nevertheless choose to limit their experience of

these campuses rather than to buy or ride a bicycle.

2. Establishing maximum distances based on the assumption that there will be a public transportation system is even more dismissible: A public transportation system between parts of the university, convenient and economic enough to be feasible, would require an extremely high density both at the university and in the town - a density on the order of a very large city.

3. Finally, the last point is hardly worth mentioning - that of using the private automobile to get around campus, as this would pose, just as a start, untenable parking problems.

Clearly, then, if all parts of the university are to be accessible and well used by the campus population, they must be within comfortable <u>walking</u> distance of each other.

It is important to note here that aside from the purely physical aspect of the comfortable walking distance, there is a more subtle but equally important psychological dimension related to it, which is this: When something is within walking distance, one is much more aware of its presence as part of one's environment and is thus more likely to make frequent use of it. The awareness of all parts of the university, furthermore, helps people relate to it - it is very difficult to relate to something if one has only a partial image of it. And to bring this argument back to the question of use, it seems clear that people will better use the university and all its parts, if they could relate to it.

Given these arguments, it would be extremely helpful to know exactly how much university activities out of the range of walking distance of every other university activity "suffer" or are lost to its potential users, by performing the following experiment:

For a number of large universities, locate services at random both inside and outside a comfortable walking distance diameter.

Then determine the university population eligible or in need of these services (most sources have these figures) and find the ratio of people actually using the service to this "target population". See if there is a correlation between this ratio and distance from the center of gravity of all university functions.

As yet we have said very little about what a comfortable walking distance is, and how it may be determined. We know that it varies substantially from culture to culture, and varies to a lesser degree according to local climatic and topographical conditions, and of course it varies for different age groups. However, it is probably not difficult to get a reliable figure given a specific age group in a specific locale.

In fact, if the results of the above experiment bear out our hypothesis, then for each university there will be a significant drop within some relatively narrow range of distances, the median of which would be the radius or one half the comfortable walking diameter for that university.

Until we perform this experiment or one similar to it we feel safe in speculating that in Eugene where the climate is relatively mild and the terrain flat, comfortable walking distance for students there is on the order of 20 to 30 minutes. For now, to be extra safe, we use the more conservative figure of 20 minutes - even a student who is less inclined toward walking than most, would probably walk a 20 minute distance.

<u>Thus we propose that all parts of the university be located within a circular zone with a diameter not exceeding 20 minutes</u>.

We have established that classes need to be within a zone with a diameter of 15 minutes, and all university functions need to be in a zone with a diameter not exceeding 20 minutes. What do these time distances mean in terms of actual diameter in feet?

In translating time distances to actual physical distances, several variables must be taken into account. Egner points out that one must consider the time it takes to gather oneself in leaving a class and settling down upon arriving (one minute total), and that one should also consider the average heights of buildings, allowing a half minute average for ascending or descending one floor. This kind of exactness applies to the case of the diameter of classes but is probably inappropriate for the other.

The point about the height of buildings is worth some discussion. Since the existing multi-storied buildings on the University of Oregon campus are well within the 15 minute diameter for classes right now, they will have little bearing on establishing the actual diameter, except to tend to establish the center of the zone near them - and they suggest a pyramid structure for classroom distribution. Since the pattern, Horizontal Communication, prescribes that buildings be low - preferably two stories - for other reasons, we assume that new classrooms at the periphery of the circular zone, will not be more than two stories. Incidently, the fact that it takes roughly 8 times as long to travel vertically as it does horizontally - 30 ft/minute as opposed to 275 ft/minute (average walking speed for students according to Egner), means that this is yet another argument for low buildings.

In addition to Egner's helpful variables, one needs to consider the increase in path length when a path between two points deviates from the straight line distance between them. We took 15 point pairs on the University of Oregon campus and compared their path length along paths, with their corresponding straight line distances. The average increase was found to be 15%.

Taking all the above variables into account, the maximum diameter of the zone for classes is 275 ft/min x 13 min - [.15(275 ft./min. x 13 min)] = 3039 feet, and the maximum diameter for all university functions: 275 ft/min x 20 min - [.15(275 ft/min x 13 min)] = 4985 feet.

Therefore: All classes must be placed so that they are evenly distributed within a circular zone of not more than 3000 feet in diameter. Non-class activities such as athletic fields, research offices, administration must be placed within a wider circular zone of not more than 5,000 feet.

DRAFT

TOWN INTEGRATED WITH UNIVERSITY

When a university is built up as a campus, separated by a hard boundary from the town, it tends to isolate its students from the townspeople, and in a subtle way takes on the character of a glorified high school.

The idea of the unified campus, set off from the town, is a historical pattern unique to American universities. The great, European universities have never been zoned campuses. The town and the university are always well integrated. In the West German town of Marburg, for instance, the extent of the integration is so deep that everyone in the town considers himself part of the university (Gilbert, E.W., "The University Town in England and West Germany", University of Chicago, 1961, p. 25).

We believe there is a sound functional basis for giving up the zoned campus concept in American universities, and replacing it with the European pattern of university-town integration.

Bullock, Dickens and Steadman, in their book, A Theoretical Basis for University Planning, claim a zoned campus "may ... create a psychological, as well as a physical, separation of town and gown, which, it is suggested, can lead to resentment and enmity on the part of the townspeople, and a snobbisness and sense of isolation in the university". (Land Use and Built Form Studies, Cambridge, England, 1968.)

These authors cite recent examples of successful integration in the plan for the Manchester Education Precinct, in Cambridge, where the town and the university are engaged in joint development of the "Lion Yard" site, and at the University of Aston, in Birmingham.

There is also evidence that the zoned campus organization leads to an undesireable isolation on the part of the students.

> "... some students feel uneasy about their loss of contact with society outside and see their undergraduate days as artificial and unreal. This emerges clearly from the survey of student opinion published by Peter Marris in The Experience of Higher Education: '... you are, as it were, cut off from the world. You don't have responsibility, you tend to live a bit in a dream world. I don't know, I have a horrid feeling we will get a shock when we leave.' 'It's an unreal atmosphere ... out of touch with the people you will work with, and what they feel about things.' Many of the students interviewed by Peter Marris in fact rated this isolation in a 'closed, unreal, artificial and irresponsible life' as the most apparent disadvantage of their university experience." (Bullock, Dickens and Steadman, op cit.)

This sense of isolation is felt by the people of the town as well. Since universities nearly always become important centers of their towns (Kerr, C., The Uses of the University, Harvard, 1963), they arouse the interest of the non-academic community. But when the university is organized as a zoned campus, remote from the everyday life of the town, it is impossible for the community to become familiar with the university - its cultural, service, sports, and technical facilities - in a natural way. And so the townspeople feel isolated from the university. They must have either a formal reason for going to the campus, or they read about it in the newspaper.

In the town-integrated universities, on the other hand, people are always using the shops and parks, cafes, sports centers, clinics, that are part of the university life - they use them because they are public facilities that form a natural part of the town; they are not "student facilities". And as they use these places, people learn, incidentally, about university life and what the university has to offer.

We have argued that the town-integrated pattern creates less isolation for the university. We also have evidence which shows that people prefer the town-integrated pattern. In addition to creating less isolation between town and campus communities, the town-integrated pattern is the preferred relationship among people who have <u>experienced</u> both patterns - isolated campus and town-integration. We learned this from a pilot study on the University of Oregon campus. The study, among faculty and students who have experienced at least two univerisities along the dimension "separate campus" and "town-integrated", indicates that people prefer the places where <u>they experienced the most integration with the town</u>.

We presented a series of seven diagrams to each of 45 subjects. These diagrams, shown below, represent a sequence of different relationships between university and town, ranging from an isolated campus to a thoroughly integrated university town. We asked each subject to pick out those diagrams which corresponded to kinds of university-town relationships he had experienced. We then asked him: "Imagine that, in your present status, you are going to another campus and the diagrams you have picked represent the situations you can choose from, with respect to the way the campus is related to the town. Assume that matters such as quality of the department, pay, attractiveness of the town, are constant. Now: Which town-campus relationships would you choose as most desireable?"

Notice that in this experiment, we never asked subjects to speculate about situations they had not experienced. Each subject chose among alternatives which he had personally experienced. In the great majority of cases, we found that people preferred the more integrated, or most integrated of the alternatives they had experienced.

When asked to choose, from all seven diagrams, including those they had not experienced, the one they felt to be ideal, 70% chose one of the three diagrams representing various styles of integration. (Note: This material, entitled "Campus Boundary: Experiment #1", is available on the University of Oregon campus, Office of Planning and Institutional Research.)

We turn now to our own speculations on the functional nature of this pattern. We believe the preference for a town-integrated university represents deep dissatisfaction with the current image of American universities. We suspect that the zoned campus has the effect of postponing maturity among the student body; it gives the campus the character of a glorified high school, it isolates young people, and tells them, subtly, that they are still children.

The town-integrated pattern, creates an entirely different atmosphere. It is not simply a bigger and more sophisticated version of a high school. It is a different place altogether. When young people come there, they are coming to a town, not to a school; they are coming as young men and women, finished with "school", and ready to be serious about their lives.

The zoned campus, like the parental home, has the effect of shielding the young from the difficulties of the world. Faced with this stiuation, young people may simply take up the expected role, struggle against it, or simply cope and try to get an education in the meantime. But none of these possibilities contain the hope of mature education.

In the universities that are functionally integrated with their towns, the students, like other townspeople, are assumed to be adults, embarked upon their lives, and they therefore tend to vehave more like adults. We would expect therefore, that the most successful teaching and the best student work occur in universities which are integrated with their towns.

In this spirit we propose the following experiment.

1. Rank order a number of randomly selected universities, according to a measure of the maturity of student work.

2. Establish, for each university, its relationship to the town, and then classify the university as an instance of the "campus pattern" or the "town-integrated pattern".

We predict there will be a significatnt correlation between those schools ranked high in 1, and those schools classified "integrated" in 2. Of course, as always, certain difficulties will arise as this material is collected and organized. There will be other correlations, various measures of "mature student work", etc. However, we expect some form of the correlation to stand: ~~If it does it will be a most extraordinary correlation~~ - for it undermines the most fundamental pattern in American universities, the isolated campus.

Therefore: <u>The boundary of the university must weave in and out, like fingers, into the town. Parts of the town must grow up within the campus, and parts of the campus must grow up within the town</u>.

<u>Context</u>

This pattern applies to any university in an urban context. It does not apply, of course, to universities which, for special reasons, are located in isolated rural regions.

DRAFT

UNIVERSITY AS A MARKETPLACE

Large agglomerations of departments and heavily centralized academic facilities, kill variety, academic freedom, and student opportunities for learning.

In the middle ages, a university was a collection of teachers who attracted students because they had something to offer. It was a marketplace of ideas, where people could shop around for the kinds of ideas and learning which made sense to them. The heavily over-administered university of today, kills the variety and intensity of the different ideas at the university, and also dampens the student's opportunity to shop around for these ideas.

To re-create this kind of academic freedom, and the opportunity for exchange and growth of ideas, two things are needed.

First the social and physical environment must provide a setting which encourages rather than discourages individuality and freedom of thought. Second, the environment must provide a setting which encourages the student to see for himself which ideas make sense - a setting which gives him the maximum opportunity and exposure to a great variety of ideas, so that he can make up his mind for himself.

The image which most clearly describes this kind of setting is the image of the traditional market place, where hundreds of tiny stalls, each one in competition with the others, each one developing some specialty and unique flavor which can attract people by its genuine quality, are so arranged, that a potential buyer can circulate freely, and examine the wares before he buys.

What does this image mean when we translate it into the terms of the university? First, it means that the projects underway at the university must be mutually accessible and open to inspection. Each faculty member must be free to develop projects around his own specialty, and make them as interesting as possible to students. It will happen when individual group projects are free to flourish, but cannot happen so easily when faculty members see themselves as part of a large scale departmental "machine".

Secondly, the marketplace requires that students are free to examine courses and faculty projects, to develop a fine sense of the breadth of academic work, and to find the particular kind of learning that suits them.

Does the physical arrangement and design of buildings have any impact on a university's capacity to function as a marketplace? We believe it does. In fact, we shall argue that a number of current university building practices are destroying these functions, and killing the marketplace atmosphere. These building practices are creating environments where small group and individual projects cannot thrive. And they are making it extremely difficult for the students to shop around and discover what variety there is.

We have isolated the four features of modern university buildings which, we believe, are doing the damage. We discuss them here, one by one. Our argument, in every case, is that the feature we describe is inhibiting the marketplace function, and that, to support the marketplace, another feature is required.

1. Sheer size. The buildings themselves are too big. Each one is swallows up a great variety of projects; and the campus tends to become a collection of large anonymous office buildings.

When a small project, a department, or a research group, is agglcmerated in a large building, its identity is diminished. People on the campus do not know that it exists. Instead they are aware of the entire agglomeration, as one, formidable bureaucracy. (There is evidence for this argument in the research report, "Preliminary Program for Massing Studies, Document 5: Visitor Survey", Environmental Analysis Group, August 1970, Vancouver, B.C., cf. the pattern "Human Scale in Public Buildings".)

We would therefore expect to find faculty and staff resisting large buildings, on the grounds that in such settings, their projects would suffer. In a small survey of University of Oregon faculty and graduate students we found this to be so. Twenty people were interviewed; they were asked, "If you could change your office, work, project, department place (depending on their positions, i.e. faculty, graduate student, project or department head), would you choose a place in a small building, with a few other projects (the example of Deady and Emerald Halls were given - both rather small, three and two storey buildings), or would you choose a place in a large building (the example of Prince Lucien Hall, the eight storey campus office buildings, was given)?" Thirteen said they preferred working in small buildings; four preferred large buildings; and three indicated no preference. <u>Sixteen of the twenty said they</u>

would prefer a campus that was a collection of many small buildings, each housing a few projects, as opposed to a campus that consisted of a few, very large buildings, with the projects agglomerated.

We conclude then, that buildings over two or three storeys inhibit the variety of projects required to sustain the university as a marketplace of ideas; and that a campus of many small two and three storey buildings is in keeping with the marketplace functions, while a campus with few, very large buildings is not.

2. Consolidation of entrances. Large buildings have relatively few entrances, and the entrances they do provide are completely public - they are not associated with the territory of any particular group. This means that there is no simple access, from the pedestrian domain, to the projects themselves. The various projects are deep within the building, away from the main entrance. People are not aware of them from the street.

In a marketplace, each stall is open to the public domain, and access is direct. People are aware of everything that is being offered. In effect, each doorway is associated with the display of one kind of offering: and the identity of that offering can be felt from the street.

To establish this character on campus, we must eliminate the consolidated public entrance. Instead, every project must have its own entrance right on the public domain with shop windows into the activity, and displays on the nature of the work. This means buildings must be low, with many entrances on the ground gloor, and outdoor stairs to entrances on the second and third floors. In effect, all the circulation between the educational projects occurs in the public domain.

3. Materials which cannot be modified. In our survey at the University of Oregon, 11 of the 13 faculty members sampled, said they would rather work in an old building which they could modify to their needs, than move into a brand new building, with regulations on transforming the space. In other words, when they have the choice, people will pass up a new building, if it means that they cannot take possession of their space, and modify it to suit their style.

Many new buildings have this defect: They stay impersonal; they resist their user's attempts to possess them. The buildings are built and finished with materials which to begin with are cold in feeling, and then are impossible to modify. Furthermore, when the buildings are large, they must be cared for by a special staff; inevitably, to make things simple for this staff, rules are created which, in the end, prevent the simplest modifications. On many occasions, during our interviews on the University of Oregon campus, we have heard the comment, that such buildings appear to have been designed with only the janitors in mind.

Wherever this problem occurs on campus, the marketplace character is lost. The special modifications and idiosyncracies of each small group do not find their way into the environment. Variety is suppressed. In some cases, the groups and individuals who cannot work in such a setting, actually leave the campus, and do their most interesting work at home, or in rented space.

The environments which people do take possession of, and which do become personal, and contribute to the marketplace character, are all small in scale, adapted to groups and projects. Even when such buildings are large, they are combinations of small units; and each place is built so that the users themselves can change it: they can add a room, build a new window, paint it, transform the classrooms.

4. <u>No strong connections between buildings</u>. Even when universities are comprised of small buildings, housing unique projects with an identity in the public domain, still the marketplace character is not complete. If these buildings are isolated from one another, or in isolated complexes, students do not get the full benefit of the variety. They are not able to shop around naturally, as they go from class to class. The places which are isolated from their experience, tend to be the places they stereotype in their view of higher education. When then isolation among buildings is severe, shopping around is impossible, and students acquire a rather distorted picture of the structure of knowledge.

In a true marketplace, all the buildings are connected by a major pedestrian system. The paths which make up the system are continuous between buildings, and strongly defined, with arcades, and with the displays and entrances at the edge of the buildings. The system is so organized, that a person will inevitably be taking walks, that, over time, lead him all through the university, and put him in touch with the details of university life.

We have reviewed the four features which tend to break down the marketplace atmosphere in universities. The features required to restore the university as a functioning marketplace are given in the solution statement to this pattern.

The result of these features is an environment of low buildings, with strong connections between them, and a deep expression of variety. In feeling, such an environment is not unlike the medieval universities, where students literally shopped around, from teacher to teacher, looking for the kind of learning that suited them.

Therefore: <u>Make the university a collection of small buildings, situated along pedestrian paths, each containing one or two educational projects. Make all the horizontal circulation among these projects, in the public domain, at ground floor. This means that all projects open directly to a pedestrian path, and that the upper floors of buildings are connected directly to the ground, by stairs and entrances. Create a display around each entrance, with shop windows, exhibits, which help identify the project. Connect all the pedestrian paths, so that, like a marketplace, they form one major pedestrian system, with many entrances and openings off it. The overall result of this pattern, is that the environment becomes a collection of relatively low buildings, opening off a major system of pedestrian paths, each building containing a series of entrances and staircases, at about 50' intervals.</u>

DRAFT

DEPARTMENT SIZE

When a department is too large, students and faculty become alienated; it becomes hard to run successful programs there; and hard to maintain the proper educational milieu.

The fact that large departments tend to overwhelm students, while small departments create a better milieu for learning and teaching has been widely discussed in the literature. See, for example, the Report of the Committee on University and Teaching Methods, H.M.S.O., London 1964; P. Meredith, "The Departmental Reality", Universities Quarterly, Vol. 17, No. 1, December 1962; H. Butterworth, The Universities and Educational Today, London, 1962, p. 8.

However, since there are also reasons for making departments large (to create variety, to provide economies of scale, and so on), it is essential to define the tolerable upper limits for department size, so that we can then allow departments to grow right up to that limit.

In order to determine a rough threshold between departments which are "small enough", and departments which are "too big", let us start by trying to define the possible functional basis for such a threshold. How does size, affect the behavior, of the people in an educational community? The only thorough and elegant work we know of, which deals with this kind of question is Roger Barker and Paul Gumps, Big School, Small School, Stanford University Press, Stanford, California 1964. These authors have studied several high schools, with enrollment varying from 35 to 2287 students, to see what effect the size has on the behavior of the individuals in the schools. Although a high school is of course very different from a university department, the ecological forces which Barker and his co-workers describe are so deep and so general that they almost certainly apply to university departments also.

Barker's studies are focussed on what he calls "behavior settings": In a series of books and papers published during the last twenty years, he has shown that the quality of life in an institution or a society, is largely determined by the variety of behavior settings available there. He has shown, essentially, that the health of a social system depends on the richness and variety of behavior settings, in much the same way that the health of an ecological system like a pond, depends on the variety of ecological niches and species in the pond.

The central empirical finding of Big School, Small School, is this: Although a big school contains a larger absolute number of behavior settings than a small school, the number of behavior settings available to any one individual is drastically less in the big schools than the small, to such an extent that it becomes difficult, or impossible, for students in the bigger schools to regulate their lives or maintain their equilibrium in the system. In the end, they learn less and develop less as persons.

The arguments, and the empirical findings, are of such importance, and such power, that we quote the following extracts in full (Barker, 1960, pp. 30-33.)

~~which have been presented in detail elsewhere (Barker, 1960, pp. 30–33~~). ~~We quote from that statement~~:

1. The behavior consequences of the stronger forces acting upon students of small high schools, in comparison with those of large high schools, will be:
   1.1 *Greater effort.* Greater individual effort can take the form of "harder" work or longer hours. The greater effort is directed both toward the primary goals of the setting and along the maintenance routes. When the assistant yearbook editor leaves, with no one available for replacement, the editor proofreads all the galleys instead of half of them.
   1.2 *More difficult and more important tasks.* There is in most settings a hierarchy of tasks with respect to difficulty and importance. The inexperienced sophomore has to take the lead role in the play when the experienced senior becomes ill.

The primary sources of these changes have been identified. They are greatly enhanced in social behavior settings by the individual's perception of increased rate of work by others, and by increased social pressure from others. One maintenance route for all members is to encourage and indeed to force others to work hard also. These ramifications of influence increase still further the strength of the claim; they also generalize the claim of a setting so it becomes a property of the whole setting.

2. Behavior consequences of greater range in the direction of the forces acting upon students of small high schools will be:
   2.1 *Wider variety of activities.* Each occupant is called upon to fill more positions and play more roles in the setting. The director of the small choir also plays the organ. This primary resultant has many ramifications and manifestations; it involves perception as well as overt behavior. The person sees himself as suitable for previously "inappropriate" tasks. It involves people as well as nonsocial situations. The person has to meet and interact with a greater proportion of the total variety of people present.
   2.2 *Less sensitivity to and less evaluation of differences between people.* This will usually be in the nature of ignoring differences previously noted, and exhibiting increased tolerance of those noted. It is a direct manifestation of the greater variety in the direction of forces; under their influence not only does the person see himself as suitable for new roles, but he sees others, too, as more widely suitable. Undoubtedly the increased strength of the behavior-setting forces aids this process, too. Recalcitrant media (the self and others) become more docile. Here we enter the field of values, at least on a functional level. When essential personnel are in short supply, it is necessary to "accept" those persons who are available and can do the job.
   2.3 *Lower level of maximal performance.* By reason particularly of the demands of great versatility, which introduce interfering skills, but also

because of the greater effort and longer hours, with consequent fatigue, the maximal level of a person's achievement in any particular task is reduced. The soloist of the chorus who is also conductor, organist, and librarian is less able to excel in one of these tasks than if he were able to devote all of his time to it. This tendency may be enhanced in a social setting where an individual's performance requires others' support, as is often the case; it is easier to pitch a superlative ball game if the fielders can catch the ball.

3. Behavioral consequences of the joint influence of greater strength and greater range in the direction of forces acting upon students of small high schools will be:

3.1 *Greater functional importance within the setting.* With increasing scarcity of population, the people who remain become ever more essential. A stage is sometimes reached where everyone is a key person; this happens when everyone in the setting is in one or more essential jobs, with no substitutes available.

3.2 *More responsibility.* In striving to maintain the setting for his own personal reasons, the individual in a setting where population is scarce is also contributing something essential to the other inhabitants of the setting, who may have quite different interests and motives. A high school student wants to study second-year Latin, and by doing so assures Sue and Joe and Mary, who want the class, too, that it will be held. He, and all the others, achieve "Latin plus appreciation." Responsibility is experienced by a person when a behavior setting and what others gain from it depend upon him. This in most cases amounts to adding a new set of social goals to the setting, or of increasing the valence of an existing set.

Both functional importance and individual responsibility are attributes experienced by a person himself, and by his associates. They do not occur to so large a degree in optimally populated settings, and not at all in overpopulated settings. A setting that is truly optimally populated does not burden itself with indispensable personnel; people are too unreliable. Substitutes, vice-presidents, committee members in excess of the quorum requirement, a second team: these are regular features of optimally manned settings.

3.3 *Greater functional self-identity.* A decrease in the population of a behavior setting below the optimum for the setting *qua* setting is accompanied by a change from preoccupation with "What kind of a person am I?" and "What kind of a person is he?" to "What has to be done?" and "Who can do this job?" This is a major shift. It is closely related to the importance and variety of jobs to be done, but it is grounded also in well-established perceptual laws. A functionless person, as is necessarily true of many in an overpopulated setting, and to some degree in an optimally populated setting, has only personal attributes and *potential* functions (e.g., abilities, aptitudes). The only functional relations he can have are the interpersonal ones of being liked or not being liked, of being judged and evaluated by others and by himself. Thus, "What kind of a person am I? (is he?)" becomes of central importance; it creates a highly personal and egocentric situation. Here, too, the person is in the position of a figure against an undifferentiated background, where small differences are clearly seen. Individual differences become important, and the innumerable ways of sorting and classifying people become prominent.

But a person with a function, as is necessary in an underpopulated setting, is more than a person; he is a person in a complicated behavioral context, and he is judged within this context. Fine discriminations as to the kind of person he is are difficult to make. There is less possibility and need to classify functioning people with respect to the kind of people they are. The question becomes "Is the job coming off?" If it is an important job, and it is coming off, the person takes on the value of this achievement no matter what "kind of a person" he is. Personality analysis (by self and others), including subtle testing, sorting, and classifying people, is a feature of overabundantly populated settings.

3.4 *Lower standards and fewer tests for admission.* A baseball game of two members can scarcely maintain the semblance of the setting although it occurs in this emasculated form in Midwest, with a batter-catcher and a pitcher-fielder. The claim of such a setting upon potential participants is very strong indeed, so strong that it will accept, solicit, even impress a five-year-old player or a parent into the setting. We are all familiar with the change in personnel policies when the prime sources of manpower are withdrawn from settings, as during a war. Age, sex, and ability tests for admission to settings are changed and the formerly rejected members are welcomed: women operate lathes, 16-year-olds supervise work crews, and retired professors are reprieved. The lower selectivity of behavior settings relatively deficient in occupants is closely related to the greater range of direction of the forces operating upon them; see paragraph 2.2.

3.5 *Greater insecurity.* Under the pressure of engaging in more difficult and more varied actions, a person in an underpopulated setting is in greater jeopardy of failing to carry through his tasks. To his personal uncertainty is added that which arises from lack of reserves in the behavior setting as a whole. The latter amounts to increased dependence upon every other person carrying through his assignments.

3.6 *More frequent occurrences of success and failure.* The underpopulated setting, by providing a situation where high aspirations (in relation to ability) are encouraged in important actions, but encouraged without authoritative coercion, provides a place for the flowering of success experiences, and also of failure experiences. The underpopulated setting is one where self-esteem and social status can both flourish, and also wither. The degree of the success and of the failure a person achieves is related to his evaluation of the importance of the setting in which the experience occurs.

The last sentence raises an important issue: All of the consequences of underpopulated settings that have been mentioned have been made as relative statements: they describe the behavior to be expected in an underpopulated setting in comparison with that which occurs in the same setting with an optimal number of inhabitants to maintain its homeostatic level. It is assumed that the settings are equally valued in both cases. In circumstances where the "same" small setting was undervalued ("this doesn't amount to anything") or overvalued ("this is exclusive") relative to the "large" setting, some of the predictions would have to be modified.

This is the theory that has guided the research we have done; we have assembled data with respect to a number of the predictions derived from the theory.

IDENTIFICATION OF K-21 BEHAVIOR SETTINGS

The reader will find that the behavior settings which are identified and described in the schools and towns we have studied usually appear to be reasonable, common-sense parts (Appendix 4.1). It must be emphasized, however, that the identification and enumeration of K-21 behavior settings is a highly technical task. Many reasonable, common-sense parts of institutions and communities can be identified which do not possess the distinguishing characteristics of K-21 behavior settings. It is essential that the operations for identifying K-21 behavior settings, which are presented in detail in *Midwest and Its Children* (Barker and Wright, 1955, pp. 50–57, 489–95), be followed by investigators making use of them. The essential technical problem is to identify a single part as one or as more than one K-21 behavior setting; e.g., is the school office a single K-21 behavior setting or is it two K-21 behavior settings: the school principal's office and the secretary's office? This decision requires rating the K-value for the principal's office and secretary's office. The K-value is a rating of the degree of interdependence of the two parts in question. If the rating of K is below the cutting point we have chosen, i.e., 21, the two parts constitute a single setting; if the rating is above the cutting point, the two parts are separate K-21 behavior settings.

VARIETIES OF BEHAVIOR SETTINGS

The definition and description of behavior settings make it clear that all settings have the same fundamental structural and dynamical characteristics, but that beyond these definitive attributes behavior settings vary widely. Like cells, crystals, and fishes, they display many different properties. The varying properties of behavior settings make it possible to clas-

Now, how small should a university department be? Unfortunately Barker does not give us any direct way of answering this question. His summary of the same problem for the high school reads: "What size should a school be? The data of this research and our own educational values tell us that a school should be sufficiently small that all of its students are needed for its enterprises". (*op*.*cit*., p. 202.)

To find a threshold for department size, consistent with this principle, we have conducted a very small pilot survey, in which we have asked faculty and students questions about their relationships with their departments, to see how these relationships depend on size.

We asked faculty from departments of different sizes whether they feel that faculty meetings are effective, whether they feel they can make a contribution to the department, whether faculty have valuable discussions with one another, and whether there is any sense of community there. We asked students from departments of different sizes, whether they feel at home in their departments, whether they have good talks with faculty members in their departments, whether their departmental advisor knows them by name? We define negative answers to these questions as "complaints". We have found that the incidence of complaints does vary with department size, and that the incidence of complaints does seem to increase sharply as faculty size approaches 20, and as student enrollment approaches 400.

TABLE

Faculty size	Complaints	Student FTE's	Complaints
> 20	60%	> 300	52%
< 20	22%	< 300	17%

We may guess that these thresholds are determined by two factors. As far as faculty are concerned, 20 is the largest group which can sit around a table - the largest group, in short, which can hold an intimate seminar-type meeting, and where people can all know each other on a first name basis. As far as students are concerned, this is the largest group of faculty, where students can hope to grasp the full spectrum of faculty opinion and discussion; hence the largest department where they can hope to have any relationship to the department as a whole, or any substantial communality of experience with all their fellow students.

Therefore: Limit the size of any university department. Our current best estimate for the tolerable maximum is 400 students plus faculty. When departments grow beyond this size, they must be split to form new departments.

DRAFT

DEPARTMENT SPACE STANDARD

Spaces are not working properly if they are overcrowded or if they are under-used. Empty desolate spaces are as bad to work in as overcrowded ones.

This pattern gives standards for spaces in departments but also defines the kinds of spaces contained in a department. Spaces not listed, such as lecture rooms, classrooms, grant research space, and libraries, are considered outside of departments and not under the jurisdiction of departments for reasons given in the patterns, Classroom Distribution, Seed Research and Project Spaces, and Decentralized Libraries.

The principle of this pattern is that departments be as large, but no larger, than the sum of the spaces given in the solution statement. This means that if departments are smaller than what these standards establish then they are entitled to additional square feet. On the other hand, if they are larger, the surplus space should be given over to other departments which are deficient. This principle is based on the fact that under-used spaces are as detrimental to a working and educational environment as over-used space. They lend an air of unseriousness, wastefulness, and of "nothing happening". People do not generally feel like working in such an atmosphere (see the chapter on Balanced Use in the main body of this report). In addition, of course, they represent a huge waste of money, and inequities when other departments are short of space.

Because these standards then are to be used in a much more serious way than standards are generally used, they are not minimum standards, but optimal ones. But they are not in any sense of the word, luxurious; they represent what is needed for a good working and learning environment.

The standards for the various kinds of spaces listed are for the most part, known and familiar. We applied our own figures from our own studies for a few. All standards are in Net Assignable Square Feet. The rule of thumb for Net Useable Space (the Net Assignable Space, plus corridors, stairs, lobbies, toilets, etc.) is to take 135% of the Net Assignable Space. The rule of thumb for Gross Building Area (Net Useable Space, plus walls, and mechanical equipment, etc.) is to take 154% of the Net Assignable Space.

Therefore: Each department must have no less or no more than X square feet of net assignable space, where X is the sum of the following:

Department Head	230 sq.ft.	
Faculty office space	140n sq.ft.	where n is the number of faculty
Secretarial and clerical space	75n sq.ft.	where n is the number of clerical staff.
Department reception (incl. 1 receptionist)	150 sq.ft.	
File space	10n sq.ft.	where n is the number of file cabinets for department office.
Department hearth	20n sq.ft.	where n is the number of faculty
Student lounges	4n sq.ft.	where n is the total number of students in the department
Graduate and T.A. workplaces	50n sq.ft.	where n is the total number of graduate and T.A.'s who do not have other assigned lab or office space.
Student workplace	25n sq.ft.	where n is the number of students in the department who live outside the 5,000 feet campus diameter, and who do not have other assigned lab or office space.

Laboratories:

Agriculture	75n	where n is the number of student stations
Animal Sciences	125n	" " "
Architecture & Allied Arts	50n	" " "
Biological Sciences	50n	" " "
Business	30n	" " "
Engineering	125n	" " "
Geography	40n	" " "
Physical Sciences	50n	" " "
Psychology	40n	" " "
Technical-Vocational	60-70n	" " "
General	30n	" " "

For each lab, add 20% for storage and preparation space.

Departmental Research

Agricultural Sciences	200n x 10% storage 300n x 10% storage	where n is the number of FTE
Biological Sciences	160n x 10% storage 250n x 10% storage	" "
Mathematical Sciences	30n x 5% storage 60n x 5% storage	" "
Physical Sciences	160n x 10% storage 250n x 10% storage	" "
Engineering Sciences	200n x 15% storage 300n x 15% storage	" "
Social Sciences	30n x 5% storage 40n x 5% storage	" "
Arts	140n x 10% storage 100n x 10% storage	" "
Language & Literature	30n x 5% storage 40n x 5% storage	" "
Professions	30n x 10% storage 80n x 10% storage	" "

The basis and/or source for each standard is as follows:

Department Head: Department heads often have several people in their office for meetings. A room which would hold say up to six people with room for displays requires about 230 square feet (from Square Foot Assignments, Center for Environmental Structure, Berkeley). Planning and Procedures Handbook for Campus and Building Development (Oregon State Board of Higher Education), gives a standard of 150 sq.ft., for department heads. We feel that this is inadequate unless a special meeting room is attached to his office.

Faculty Office Space: Each faculty needs a private office where he can hold a private meeting with one or two students. This requires 140 square feet (Square Foot Assignments, CES). This is again higher than the figure of 100 square feet given in the Oregon Handbook. Faculty-student meetings are much more effective if they force an across the desk relationship - the chance for a more informal arrangement will require more than minimal 100 sq.ft.

Secretarial and Clerical Space: 75 sq.ft. is the standard for a full time, eight hours a day basic workplace. (Square Foot Assignments, CES). Oregon Handbook gives 75 sq.ft. to secretaries and 50 to typists in an open office. We have found that work stations in open offices need partial enclosure for them to be at all effective, requiring then at least 75 sq.ft./station.

File Space: 10 sq.ft. per file. This is the figure given in the Oregon Handbook for file cabinets with work space.

General Office Reception (includes one work station): 150 square feet. This is the figure given in the Oregon Handbook.

Department Hearth: 20 square feet per faculty member (See the pattern, Department Hearth). This room should be able to hold the entire faculty for meetings. The Oregon Handbook gives 20 feet per station as standard for conference rooms.

Student Lounges: 5 square feet per student majors in the department (see the pattern, Student Lounges). This figure is based on a calculated guess that a maximum of 25% of the students in a department will be in department lounges at any one time.

Graduate and T.A. Workplaces: 50 sq.ft. per T.A. Given in the Oregon Handbook.

Student Workplaces: 25 square feet for every major living outside the 5,000 feet campus diameter, and not having other assigned lab or office space (see the pattern, Student Workplaces). We normally advise 40 sq.ft. for a workplace used for short periods of the day. However, since these workplaces will be grouped in most cases, and the chances are very small that everyone in the group would be there at any one time, we feel that 25 sq.ft./ student will be enough; at the least it provides the students with a place they can call their own, where they can leave things.

Laboratories: These standards are given in the Oregon Handbook, as Laboratory Design Standards.

Departmental Research Space: Since standards were not available for Research Space at the University of Oregon, we use standards employed by the University of California system.

Note that the space standards for both laboratories and research change drastically from year to year as technologies change. These figures must be carefully reevaluated every year - or every two years at the minimum.

DRAFT

FABRIC OF DEPARTMENTS

Over-emphasis on the individuality of departments helps to fragment knowledge by keeping it in watertight compartments. Yet each department requires its own identity.

It is widely recognized, that "departments" tend to reinforce the separation of knowledge into watertight compartments. For instance, this is, of course, first and foremost an administrative problem: it cannot be solved without changing the department organization of a university. However, the physical environment can also help to maintain the fragmentation of knowledge: a proper understanding of this effect, will influence our ideas about the physical distribution and arrangement of departments.

To understand the problem, let us compare three possible ways of distributing faculty and research over the physical space of a university.

1. Grouping by projects.
2. Grouping by departments.
3. Grouping by broad subject areas.

1. Grouping by projects. In this case offices, research and teaching are grouped according to face to face interest groups containing from 5 to 10 faculty members, together with the offices, research space, etc., which they need. The faculty who belong to one project

are contiguous. However, the projects belonging to one department are not necessarily contiguous.

2. Grouping by departments. In this case, the projects defined in (1) are themselves grouped according to the departments they belong to. In this case, all the projects belonging to one department are contiguous; however, departments belonging to any one subject area, like physical science, are not necessarily contiguous.

3. Grouping by broad subject areas. In this case the departments defined in (2) are themselves grouped according to their intellectual affinities, to form complexes like behavioral sciences, physical sciences, performing arts, etc., and all the departments in one such complex are contiguous.

Let us now go back to the original problem, and ask: Which of these distributions will contribute most to the formation of connections between different academic disciplines. There are two issues at stake:

1. The maintenance of connections.
2. The formation of new connections.

We first discuss the maintenance of connections. It is plain that the members of a department who meet, regularly, must be reasonably near each other. If they use the same facilities regularly, they must be reasonably close to these shared facilities. However, the need for proximity is sometimes exaggerated. Detailed analysis of the need for proximity, shows that the distance threshold at which two points are considered to be too far apart, depends on the frequency of the trips which any one person has to make between these points. For example, a trip which is made once an hour, is not considered to be a nuisance until the points are more than 100 feet apart; a trip which is made once a day is not considered to be a nuisance until the points are 400-500 feet apart; and so on. (See Alexander, Walkey and Schreiner, Proximity Analysis, Center for Environmental Structure, Berkeley, 1970._

Bearing this effect in mind, let us discuss the thresholds for three critical distances.

1. Distances between immediate colleagues and collaborators. Since there may be minute to minute discussion between them, they must be very close together: within 50-100 feet if possible. This explains the need for grouping by projects.

2. Distances between individuals and the department they belong to. We have argued elsewhere (Departmental Hearth), that every department needs a strong center, not only for mail and departmental administration, but also for discussion of results, perusal of recent journals, etc. It is reasonable to assume that people will want to make at least one trip per day to their departmental hearth. Proximity analysis tells us then, that every project must be located within 500 feet of its departmental hearth - <u>but need not necessarily be any closer</u>.

3. Distances between related individuals from different departments. Note first of all, that the relationships which individuals have with people from other departments are far more varied that any simple subject areas suggest. For example, the members of the psychology department are not primarily associated with sociology and education, as the behavioral science grouping would indicate - each person has his own relationships - and they are very varied - biology, neurophysiology, architecture, art, music, education, sociology, business, economics, chemistry, and so on. Secondly, the frequency of the trips implied by these relationships is not particularly high. It is very rare indeed for a person to have daily contact with any other person in another department; even weekly contact is relatively rare. Since a weekly trip, can perfectly well include a ten minute walk - it can, go from one side of campus to the other.

We see then, that there is little to be gained by any particular proximity between departments. Since there is no clearly discernible pattern of relationships and the distances are not critical anyway.

We conclude then, that for maintenance of existing connections, faculty offices and facilities should be clustered to form relatively small projects, and that these projects must be within 500 feet of the departmental hearth which they belong to - but that there is no advantage to be gained by any further grouping; neither by contiguity of projects which belong to one department; nor by the grouping of departments to form broad subject areas.

Let us now turn to the formation of new connections. We must first of all dismiss the idea that sheer physical proxmity creates connections. It was a common mistake in early theories of environmental planning, to assume that proximity alone, can create connections between people, which has since been vigourisly criticized (see for instance, Melvin Webber . . .). It is certainly true that a cluster of offices witnin a project, may create associations between the people who have offices there; and true that the departmental hearth may create connections too between members of a department: but in these cases, it is because there is a common meeting place, where you see a familiar face, and have a chance to intensify a connection which already exists. Proximity between buildings alone, just does not have this effect. Have you ever formed relationships with, anthropology, say, just because the anthropology department was next door? In fact, we doubt strongly whether proximities play any role in creating connections between disciplines.

We suspect that the physical environment helps, and hinders, the formation of interdisciplinary work in an entirely different way - a way that is in fact almost opposite. Contrast two kinds of university: one where there are a number of separate buildings, and each one of them is associated with a discipline: Psychology, Physics, Law, Modern Languages. The other, where there are no buildings that can be associated with "fields"; but where a building either contains a variety of different projects, that are entirely different in character, or contains small projects so particular that they cannot be named by one particular category. We believe it is possible that the first kind of university actually helps to reinforce the notion that academic fields are separate, watertight and separate compartments, because the buildings express this fact.

Consider, in particular, a law building. It is possible, and indeed likely, that people will get two impressions from the existence of this building. First, since there is a simple label for all the activities which go on in this building - "law" - people have a stereotyped image of the activities there, and have no detailed understanding of them - because, in their minds, they can always summarise what happens there as "law". Second, since the building is so clearly marked as the territory of the law school, it is natural to expect that people will feel excluded, feel that they have no right to be there, and that the only people who do have a right to be there are the people who are doing "law". The combined effect of these two processes, is simple: it discourages people from thinking about the detailed projects that might be going on there; and discourages them from going there. In short, it prevents people from forming any connection with the law school, cognitive or practical, unless they happen already to be "in" the law school. Whereas the proximity of buildings has little effect on the formation of connections between disciplines, this kind of cognitive stereotyping can very seriously hamper the formation of connections.

To study this question we intend to ask people which particular projects on the campus, apart from their own, they feel most connected to. We believe that we shall find that those departments which do have clearly marked territory, will be least often chosen: and that people will feel most connected to the projects, or individuals, who either have offices in a "mixed" building, or else have offices in small buildings outside the range of their departmental building which cannot be stereotyped by the name of their department.

Let us assume for the time being, that our results confirm this hypothesis. In that case, to solve the problem of creating departmental identity, without jeopardizing the formation of interdisciplinary bonds, we must try, so far as possible, to treat each department as a collection of projects, all within 500 feet of the departmental hearth, but otherwise loosely interleaved, with projects from other departments, and that we must avoid the formation of buildings which are too strongly identified with one department, or one complex of departments: Therefore:

<u>Give each department a clearly identified home base, but spread the parts of the department within a radius of 500 feet, so that they interlock with the parts of other departments. No one of these parts should contain less than five faculty offices.</u>

LIVING WOVEN INTO LEARNING

Students who want to live closely related to the university - want their housing integrated with the university; yet most on-campus housing provided today, is zoned off from academic departments.

In the pattern, Students Within 10 Minutes of Campus, we have shown that all student housing needs to be within 5,000 feet of the center of university functions. We attempt now to determine exactly what spatial relationship between student housing and academic departments is needed within this boundary. More explicitly, we address ourselves to the questions should housing be integrated with academic departments?, and if so, how much of the housing, and how integrated should it be?

Some students want to live closely related to the university; others want to live more closely related to the town. This is borne out throughout the U.S. where campuses are located in towns. Inasmuch as all students want to live close to academic departments, for convenience, their desire to be in the thick of university functions fluctuates during their academic career. Usually a student starts off wanting a close relationship to the university, but feels more and more as he gets older, a desire to have his housing more independent - more like other people.

We asked 42 students at the University of Oregon to state their preference between four situations: 1) living on campus in university administered housing; 2) living on campus in privately or cooperatively administered housing; 3) living off campus in university administered housing; 4) living off campus in privately or cooperatively administered housing.

The results are tabulated as follows:

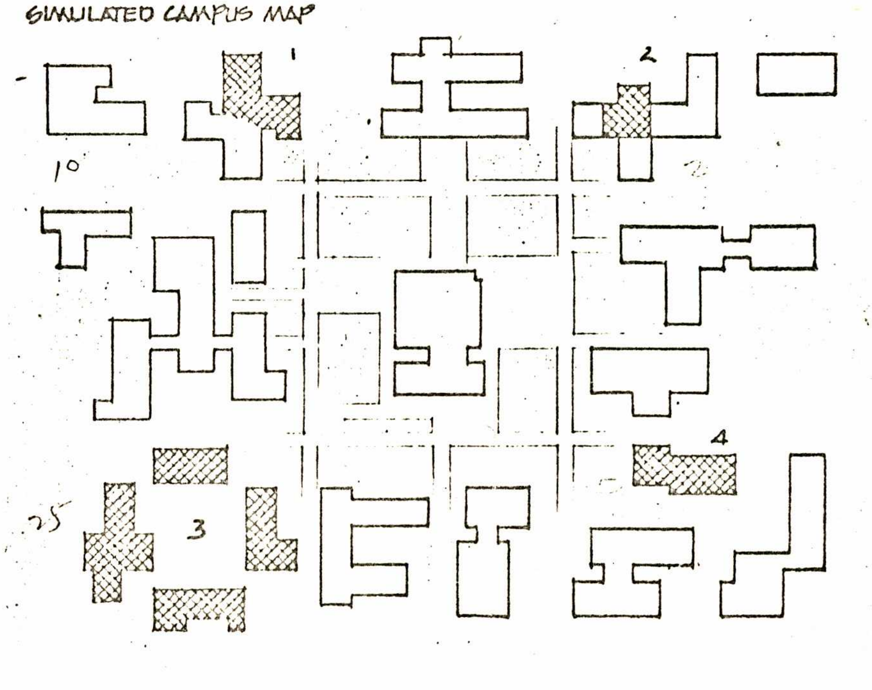
	On Campus	Off Campus
University Administered	4	6
Private or Co-op Administered	8	24

Thus 30 out of 42 or roughly 75% chose the off-campus situation.

A smaller survey of 15 students verified this ratio - 10 out of 15 percent said they preferred living off campus.

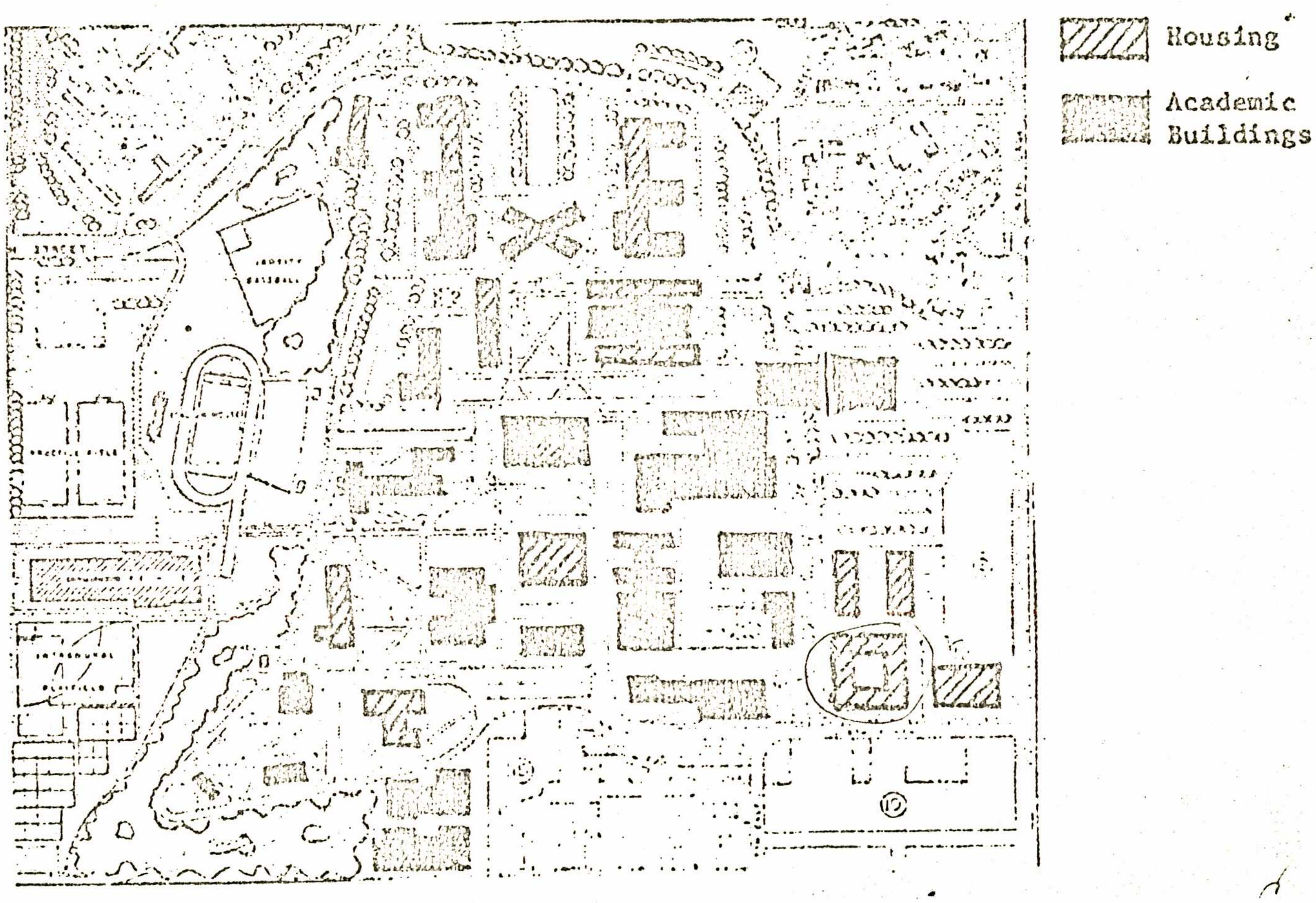
In the second part of the survey of 42, we presented the following diagram showing 4 different degrees of integration of housing with academic functions, asking the students to choose the one they preferred.

SIMULATED CAMPUS MAP



Among the 30 students who chose the off-campus situation in the first question, 21 chose the least integrated diagram (no. 3). Of the 12 who chose the on-campus living situation, 8 chose some degree of integration (1, 2 and 4).

In the second survey the 15 students were presented a slightly different picture from which to choose a living situation.



All but two chose the two integrated pictures, 1. Housing mixed in the same buildings as the classes and office, and 2. Housing in separate building, but the buildings themselves mixed in the university buildings.

In analyzing the results of these two surveys, it is unclear as to whether more students would not have chosen to live on campus in a more integrated situation, had all other considerations been held constant - especially that of university restrictions, which is apparently a major concern.

On the other hand, the students who chose the on-campus living situation, and the more integrated picture of housing with university, were more consistant in their reasons for the two choices, with respect to the central question that they wanted the two environments more integrated.

Since it would be a serious mistake for the university to provide more housing integrated with academic departments than there is a demand for, we take the more conservative viewpoint, and let the 20 to 30% of the students who consistently advocated an integrated picture of their housing with the university, indicate what the ratio should be.

The surveys strongly indicate that the housing which is closely related to the university, be physically integrated with academic departments. This is contrary to what most universities provide their students when they provide on-campus housing.

It is becoming more and more common practice in university planning to zone off student housing in some special area separate from academic areas, and in fact, also from the town, thereby destroying the very relationships that both groups of students look for.

Let us look particularly at the problem of the students who want their housing integrated with the university.

Even if the housing is on-campus and very close, the fact that it is separate and agglomerated, splits the two worlds, so that the whole advantage of having it on campus is lost. Thus the student leaving the academic zone tends to have all thoughts of school wiped from his mind when he gets home; conversely he enters the academic zone, with the same sense of now distinctly having left his living environment and having entered the academic one.

Furthermore, zoning residential from academic areas leaves the academic area with an atmosphere of sterilty and deadness, much like what Wall Street is like during the weekends or at night. As Richard Dober points out (The New Campus in Britian, Ideas of Consequence for the United States, EFL, 1958., p. 45) "... You create a separate residential area, and unless you are careful the whole center of the university goes dead in the middle of the afternoon".

Given then, that integration is needed, what is required to achieve it?

The problem of the university going dead, will not be solved by an even salt and pepper distribution of the two, since the housing will never be dense enough to lend life to the entire campus. Such a distribution would in fact make the housing itself unpleasantly dead. Furthermore, the pattern, Size of Student Communities, gives 40 to 60 as the right size for student communities. Thus these two points suggest that areas of housing of at least 40 to 60 students alternate with areas of academic departments, and in order to keep either from being too agglomerated and zoned off, we guess that there should be no more than two student communities together, and probably no more than 300 feet of continuous academic departments along any path. From informal observations, we estimate that it is unpleasnat to pass any more than a block - roughly 300 feet - of continuous office buildings, at night, without coming to some buildings with life in them - housing or shops.

Therefore: Provide housing for 20 to 30% of the student population within the 3,000 feet university diameter (given by the pattern, Campus Shape and Diameter). Do not zone this housing off from academic departments - instead alternate the two so that there are never more than two or three student communities or more than 300 feet of academic function, before each is interrupted by the other.

Except for the pattern, All Students Close to Campus, we have not looked into the special needs of students wishing their housing to be distinct from the university. It is unlikely that universities will be providing housing for this group, but if they do because of housing shortage in the town, or for any other reasons, further studies would have to be conducted. It is not clear from this study, alone, what is needed by them. We speculate however, that they too should not be zoned off in some special part of town, but that they should be integrated with the town, and also in groups of 40 to 60.

UNIVERSITY AS A MARKETPLACE

(SEE CAMPUS)

DRAFT

DEPARTMENT HEARTH

When an academic department is just a collection of offices, without a focus, there is little chance for a sense of community to develop; and the possibility of an open exchange of ideas is diminished.

No department can survive as a human organization without constant informal contact among its members. However, as people become specialized in research and instruction, it becomes unlikely that informal communication can be sustained by normal work procedures.

What organization can we introduce to solve this problem? Our interviews with faculty from virtually every department at the University of Oregon, confirmed our idea that the correct organization is a single place, which functions as the social heart for the entire department: a place that people drop by every day, to check their mail, to look over the latest periodicals, to drink coffee, a place where students can come to find out about the department, and chat with the professors. This solution has been tried in many places, and people who have experienced it claim it works very well. The Chairman of Sociology, at the University of Oregon, told us, "The department hearth is worth its weight in gold".

However, we found very few places where a department hearth was actually functioning on the University of Oregon campus. Nearly everyone complained about the lack of contact within their departments, and voiced a need for some kind of lounge space. People who, at one point in their career, had experienced a real department hearth, grew nostalgic, as they told us how wonderful it had been.

The problem is that the department office has been substituted for the department hearth. The office draws people in, usually to pick up their mail, but it does not encourage them to stay, for more than a few seconds. To make people linger, a substantial hearth is required. The three essential characteristics, usually left out of the department office, are comfortable places to sit, coffee or beer, and a table full of the current periodicals in the field.

To make the hearth the functional center of the department, it is also necessary for department offices to be close enough to it, so that a trip once a day is not a nuisance. From the pattern, Proximity Analysis we get the figure of 500' as the limit. When people are situated in offices more than 500' from the hearth, it becomes a bother to drop by, every day, and contact breaks down. Therefore:

<u>For every department, create a social hearth. Place the hearth at the center of gravity of the department offices; and beside a path that everyone uses. Within the hearth, provide a lounge, department mail, coffee, secretarial pool, supplies, small library, student information, etc. Make certain all department offices are within 500' of the hearth.</u>

STUDENTS CLOSE TO CAMPUS

When students live too far from campus, they cannot be part of university life.

Students need the chance to move back and forth spontaneously between their living and university environments. When the two places are separated by vast commuting distances, the decision to go from one to the other becomes irrevocable. If a student is to take his academic life seriously, he needs to be able to go back to campus from his home to see a professor, or look up a reference in the library, or drop in on a colleague in his department when it occurs to him. Conversely, he should not be constrained from taking a break from work while he is at the university - to go home for a nap, or check the mail, or babysit for his wife, whenever he can and feels like it. The freedom to move back and forth like this has a great deal to do with how involved he can get in the university and how much he enjoys it. In his study called Student Housing Survey, Fall, 1966, Office for Institutional Research at Wayne State University, Cedar states that "... the primary factor in a student's decision to live on campus will be his degree of involvement in the University". ("On Campus" in Cedar's term means within a mile of it.)

This same study found that 54% of the students at Wayne wanted to live in the University area, but this figure is taken as conservative due to some special conditions at Wayne: 89% of the students currently live more than two miles from campus, so that most of the students have not had the experience of living close to campus. (It was found that the closer students live to campus, the more they desire to live in the university area.) Furthermore, the area around the campus is badly deteriorated and has a high crime rate, and is thus considered an undesirable area to live in by most. An additional special condition at Wayne, is that 50% of the students there live at home with their parents.

Cedar tabulated the students view of advantages and disadvantages in living close to campus as follows:

Table 17

Advantages of Living on Campus

Comments	Percentage
Easier access to University library, classes, professors, other University facilities	27.5%
Reduction of transportation and parking problems, and transportation costs	14.5
Saves time in general or saves travel time	11.8
Improvement of student social life, e.g., conducive to forming friendships, participation in social activities	11.2
Being in an environment with many academic and cultural activities	10.5
Time saved - spent at library, other University facilities, or used for studying	3.9
Campus is conducive to study	3.8
References to unspecified activities, e.g., closer to activities, can participate in more activities	3.6
Separation from family, e.g., encourages independence, responsibility, privacy	3.3
Convenience	3.1
Close to downtown, e.g., shopping, theatres	2.5
References to campus atmosphere, e.g., enjoy campus atmosphere	1.0
Other	3.4
Total	100.1%*

Base N . . . . 1575 +

* Does not total 100% because of rounding.

+ N = The number of comments.

Table 18

Disadvantages of Living On Campus

Comments	Percentage
Unspecified negative comments about the neighborhood, or descriptions such as unattractive, bad, dirty, or objections to poverty, traffic, congestion, noise, residents	27.1%
Crime, rough neighborhood	21.7
Too expensive, e.g., high prices, it would cost me more to live, the cost	7.4
Environment, including housing, not suitable for raising children, e.g., schools, playmates, play facilities, neighborhood	6.3
Housing facilities poor or too expensive	5.4
Parking problems	5.1
Loss of contact with family and/or friends, neighborhood activities, associates, interests	3.7
Too far from employment	3.4
Inadequate shopping and service facilities	3.2
Lack of student social life and school spirit, extra-curricular activities, impersonality on campus	2.6
Campus life is restrictive in terms of the limitation of experience and exposure or regulations imposed by the University	2.0
Lack of good food service	1.7
Lack of recreational facilities	1.7
Campus atmosphere not conducive to study, e.g., friends, activities	1.4
Lack of privacy	1.2
The responsibilities of being on one's own, away from family, e.g., preparing meals, doing laundry, doing house cleaning	1.2
Other	4.9
Total	100.0%
Base N	884 +

+ N = The number of comments.

Note that, the main advantages are that of easier access to university professors and facilities, reduction of transportation and parking problems, saving time in general, improvement of student social life, and being amidst academic and cultural activities; while the main disadvantages cited have strongly to do with undesirable conditions existing specifically around the Wayne campus; the neighborhood close to campus is deteriorated and considered undesirable, there is a serious crime problem, and housing is too expensive, etc.

From this, it would be safe to assume that almost everyone wants to be conveniently close to campus if conditions close to campus were ideal. However, there are differences in how close within this convenient distance, people want to be, for other reasons. We discuss these variations later.

Let us first try to determine the outer limits of the location of housing given that almost everyone wants the convenience of being able to go back and forth from campus if they could also have other requirements met.

We conducted a small survey of 55 students at the University of Oregon to determine the distances people live and how often they make spontaneous trips back and forth between the two places. We found that if a student lives within 1/2 mile of campus, he averages five trips per week home for breaks from campus, he brings a friend home from campus 2 times per week, and he goes back to campus from home on the average of 2 times per week. If he lives within a mile, he goes home twice a week in between classes, brings a friend home once a week, and takes a trip to campus from home 1.5 times a week. If a student lives over a mile from campus, he never makes a trip home, rarely brings a friend home (twice a month on the average) and takes a trip to the campus from home slightly less than once a week.

Thus the frequency of trips between the campus and home drops considerably at a mile distance from the center of campus.

This seems intuitively right. One mile is probably the maximum distance a student would consider a walking distance, and we guess that this has a lot to do with whether or not he feels a place is accessible. In other words, even though he may actually travel this distance by car or bike, the fact that it is still a conceivable <u>walking</u> distance makes it seem conveniently accessible, and he makes more trips as a result. (See Campus Shape and Diameter.)

<u>Thus we conclude that all students should live within a one mile radius of the center of campus</u>.

But our analysis of the survey and Cedar's report indicates that as much as students want to live within a convenient distance of the campus, they vary in how close they want to live within this one mile radius.

We know that roughly 25% want their housing totally integrated with academic activities (see the pattern, Living Woven into Learning).

We estimate that the rest fall into two groups: roughly 25% want their housing partially integrated with the university, and roughly 50% want some distinction between their living and academic environments. We have no hard data to support these last two figures. As far as we can gather, about 50% of the students in the survey of 55 expressed a fairly consistant desire to have their housing somewhat distinct from the university. And we guess that the remaining 25% are somewhat in between the group wanting total integration and the group wanting a separation.

The reasons given by students expressing a desire for their housing to be distinct from the university match some of the "non-specific" disadvantages of living close to campus cited by the Wayne students. By non-specific, we mean those reasons that would apply to any campus, regardless of the state of the area immediately around the campus. These are:

No. 3 on the table: Environment, including housing not suitable for raising children - e.g., schools, playmates, play facilities, neighborhood.

No. 11 on the table: Campus life is restrictive in terms of the limitations of experience and exposure or regulations imposed by the university.

In addition, the Oregon students who expressed a general desire for some separation gave the reason of wanting "the opportunity to get away from academia".

Clearly these three concerns do not have to be in conflict with the general need of wanting to be conveniently close to, or within one mile of the campus. They all seem to indicate a desire to live among "regular" people, and not be restricted to student neighborhoods.

The critical question then seems to be that of density of students with respect to the density of other people. If we take the ratios of students wanting to live closely and partially integrated, and the ratio of students wanting separation from the campus, and place them in three zones, we get the following densities:

1. 25% of the student housing integrated with academic activities (see Living Woven into Learning). If the total student population is 15,000, then 3,000 students live within this inner square, resulting in a density of 15 students per acre.

2. 25% of the student housing integrated with peripheral university activities (see Campus Shape and Diameter) in a ring between 1500 and 2500 feet from the center of campus. If the total student population is 15,000, then 3750 students live in this ring, resulting in a density of 10 students per acre.

3. 50% of the students separated from campus, integrated with the town, in a ring between 2500 and 5000 feet from the center of campus. If the total student population is 15,000, then 7,000 students live in this ring, resulting in a density of 4 students per acre.

In most university town, of medium to small sizes like Eugene, the average density per acre around the university is usually medium - about 20 units per acre or 50 people per acre. The above distribution of students creates a pattern where students are more mixed with town residents as they get further away from campus, and it is still possible for the students living furtherest from campus to be conveniently close to it.

Therefore: Locate all student housing within a one mile radius of the center of the university in the following proportions:

25% integrated with academic activities within 1500 radius of the center (See Living Woven into Learning).

25% in a ring between 1500 and 2500 feet of the center.

50% in a ring between 2500 and 5000 feet of the center.

LIVING WOVEN INTO LEARNING

(SEE DEPARTMENTS)

DRAFT

STUDENT HOUSEHOLD MIX

The segregation of single from married students is artificial and stifling.

The ratio of students who are single, and married has been changing very rapidly toward a higher ratio of married students. There are several reasons for this: the ratio of married undergraduates to single undergraduates is increasing, as students tend more and more to get married or live together at younger ages, and the number of married graduates increase, as universities increase their graduate programs.

Right now, at Eugene, for example, the breakdown of single and married students is as follows:

Single undergraduates	7180
married undergraduates	1623
single graduates	1619
married graduates	2380

Because the number of married students relative to single students, has been increasing and since most universities up to a few years ago emphasized single student dorms over married student housing, in their housing programs, many universities are already faced with the problem of vacancies in their single student dorms, and a shortage of married student housing.

Married students, in fact, often have a more difficult time finding housing which is within their means, than single students. For example, when single students live in apartments, they often get as many roommates as they need to cover the rent, while a married couple cannot do this as easily.

Obviously anu program for student housing should reflect the actual ratios of different student household types.

The common practice at most universities is to segregate the different types of households, placing single student dorms on or near campus and putting married students at some distance from campus. This seems altogether wrong, or at best exaggerated.

Let us look for example at the question of friendship formation. The opportunities for friendship formation is crucial in student housing since it is during the college years, when interests and values are developing, that many lasting friendships are formed.

While it is true that people are likely to form the most friends among their own kind because of mutual interests and similar circumstances, it isn't natural for them to limit themselves exclusively to people who have the same marital status, and indeed it is questionable whether this would be at all healthy.

The various stages of life are obviously a continuum, and one group needs contact with the other: When single people have close friendships with married people, it gives them a chance to see what marriage is like, and what it is like to have children. Conversely, it is unnatural for married students to lose contact with their old single friends.

Students do form friendships across the maritial line, and they are more apt to if they live in a mixed situation.

In a small survey of 27 students at Eugene, we found that married students living in segregated housing average 6 single friends, while married students living off campus in mixed neighborhoods average 10, and that single students living in segregated dorms average 2 married friends, while single students living off campus in mixed neighborhoods average 2.75.

The idea of married students living far away from campus is not justified either. Married students want all the conveniences of living close to campus as much as single students: they, for example, want easy access to campus facilities and professors, and a reduction of their travelling and parking problems, etc. (See Students Close to Campus).

The one requirement they have if they have children, which single students do not have is for their children to have enough playmates and schools to go to. If all married student housing was located within a mile of the campus as prescribed in Students Close to Campus, there would probably be enough people with children (students or non-students) so that this would not be a problem.

Thus, the segregation and removal of married students from single students, to the extent we find it in most universities today, is not justified, is unnatural and can even be somewhat harmful to students.

What should the extent of the mix be? Some clustering of students by household type makes sense, since students do still seek their own kind for <u>most</u> of their friends. But these clusters should be small - 6 to 12 units as in a small apartment house, and they should be part of a larger community made up of a mixture of groups of different household type (see Student Communities). Therefore:

<u>Make sure the amount of student housing for single and married students reflects the actual ratio of single and married students on campus. Cluster household types in small groups of 6 to 12 units but mix these groups with other small groups of other kinds of households, to form larger communities of 40 to 60 students.</u>

PRIVATE ACCESS TO YOUR ROOM

In communal living arrangements like dorms and cooperative apartments, it is very difficult to strike the right balance between communality and privacy. A critical feature is the organization of the entrances, in relation to the common and private spaces.

If there is one common entrance, and/or paths to individual rooms all lead through the communal parts of the building, then people tend to feel that there is not enough privacy: There is too much group interaction surrounding each person's comings and goings. The communal feeling becomes forced.

We found this to be the case among dorm residents, at the University of California, Berkeley. The dynamics went as follows. Originally, people chose communal living in the dorms, because it offered a chance to meet people, and find their way into university life. The dorms provided an immediate set of friends, roommate and neighbors down the hall. However, as time passed, and students got the feel of university life, they tended to have friends scattered throughout the community, as well as in the dorms. But this process occurred at different rates for different individuals. And at any one moment, students varied in the balance of community and privacy they sought, within their living group. The students who had established a net of friends in the community, through their department, girl friends, interests, etc., wanted more privacy within the living group, than the students who found their primary community within the dorm.

This is a natural sequence of events; it is inevitable in communal living. However, the physical arrangement of the dorms made it extremely difficult to evolve a social order that was compatible with this process. The dorm was organized as if the dorm community, itself, was the only substantial community. The organization featured one effective entrance to the building, through communal space; a common hallway, which itself became a well-used communal space; and all the rooms arrayed off this communal hallway. As a result, people were always "sticking together"; aware of each other's comings and goings; tagging along; eating together: The dorm community became claustrophobic, and some people felt they had to "break away".

The majority of the people interviewed found the social order oppressive, in just this way. One girl said, "I get along with the people on my floor, but they all think I'm a snob because I don't do everything with all of them". (This material is presented in Chapter III of Dorms at Berkeley: An Environmental Analysis, Van der Ryn and Silverstein, Center for Planning and Development Research, Berkeley, 1967.)

We believe this sequence of events is typical in communal living no matter the size of the group. If the dwelling has one common entrance, through communal space, the group will have trouble establishing a workable balance of community and privacy. In some cases, this kind of nuisance will actually split the group entirely.

All the dorms which work, allow people to walk directly to their rooms, without passing through communal spaces, if they want to, even if there are also other paths to the rooms, which do allow them to pass through the communal areas. It is only under these conditions that each person can freely choose a different balance of community and privacy, according to his mood and style. Therefore:

Provide private access for each living unit in a communal dwelling (whether a family, an individual room, or a couple's room); locate the communal spaces away from these entrances and circulation, in such a way that people can glance in on them, but are not always entering and moving through them, as they come and go.

This form of organization lowers the pitch of communal life. People are free to choose the amount of communality they wish. In the extreme, let us say for a couple who want nothing of the communal life, the place is like an apartment house; they come and go as they please; and the group adapts to their withdrawal. Or, in another case, the group does form a solid primary community, so they gather together in the common space every night, for dinner.

This pattern is not difficult to apply, when the overall density of units is low. Under such conditions it is reasonably simple to provide direct access to the outside, from each unit, or to create a rather anonymous circulation hall. When the overall density is high, and the building contains more than two storeys, the pattern can be achieved with frequent outdoor stairs, the stairs open, and with no doorway, and units opening directly off the landings or along covered, outdoor arcades. This is the archetype that has been used for hundreds of years in the Cambridge residential colleges:

(Drawing & Photo)

In some schemes it might make sense to give the units two entrances - both a private entrance <u>and</u> a door to the communal territory. This scheme is proposed in <u>Dorms at Berkeley</u>, <u>op.cit</u>., pp. 78-9.

(Drawing)

ADMINISTRATION DECENTRALIZED

Administration is very often over-centralized: All the branches are located together, in one imposing complex, when, in fact, various parts of administration could operate more effectively, if they were located according to the functional connections each requires in the community.

University administrations tend to become very highly structured organizations, containing many parts, each part corresponding to the management of some service for a particular sector of the university community. In some cases these different administrations are functionally related to each other. For example, in the case of the Registrar and Student Service Research, both organizations draw from the same set of records, and so they must be located together. On the other hand, there are many parts of university administration that do not bear a strong functional relationship to one another. Student counselling, for example, has no relationship whatsoever to Admissions, Financial Aids, Data Processing, etc.

However, it is often the case that the entire administration is located together, in the same building, as if each department had functional cause to be near the other departments. Not only do the various departments not all need each other, but it is genuinely impractical to put them all together, in one building.

It creates problems:

1. Locating all the departments together, can weaken the relationship between an individual department and its particular community. For example, Student Employment needs to locate among student, perhaps in the student union; but not among other departments, in an administration building. Located in its natural community, the service is inevitably more accessible: people get to know about it, simply by passing it many times, and finally stopping in.

2. Locating the administration in one place creates a sizeable and imposing administrative territory, which in turn, strains the relations with the community at large. Under such circumstances, people feel as though they are dealing with a vast, interlocking bureaucracy, every time they come in contact with an individual service. (The feeling that such impersonal territory creates, in general, on the campus, is discussed in F. MacShane, "The Horrors at Berkeley, or Did Architecture Make Students Riot?", Art News, Vol. 64, No. 5, September 1965.) Just as this kind of territory keeps the community out, physically and psychologically, so also does it tend to keep the staff in. It is an old story in large institutions, that people become trapped in their own territory, and lose touch with the real phenomena, behind the paper. Certainly location alone is not at the root of this problem, but it does

play a role. When departments are located independently, and in direct relation to their users, they tend to develop a character that is more responsive to their clients, than the aggregated departments (cf. Human Scale in Public Buildings).

3. The creation of a single administrative complex creates other problems, for the staff. Work groups tend to become too large, for pleasant working conditions; work styles become homogenized, to suit the top-down management style; and the"red tape" proliferates. These problems are taken up, in a general form, in the patterns, Small Work Groups, and Small Services Without Red Tape.

Given the fact that some decentralization is desireable, we must now establish which departments can be located independently, and which departments must be located together.

At the University of Oregon, we find that Administration can be immediately divided into two groups: the services that are used daily by students and faculty, and those services whose functions are remote from everyday campus life. Financial Aid, Foreign Student Affairs, Counselling, Studemtn Employment, Personnel Office, Student Services, and the President's Office and Staff are all of the first type - they have a direct relation to the community, and they are used spontaneously by the students and faculty, as needs arise. On the other hand, we have Admissions, Registrar, Business Office, Student Service Research, and Data Processing.

These groups share records, and do not require spontaneous, daily contact with the university community. Their services are handled formally - often through the mail, and by bulletin and telephone.

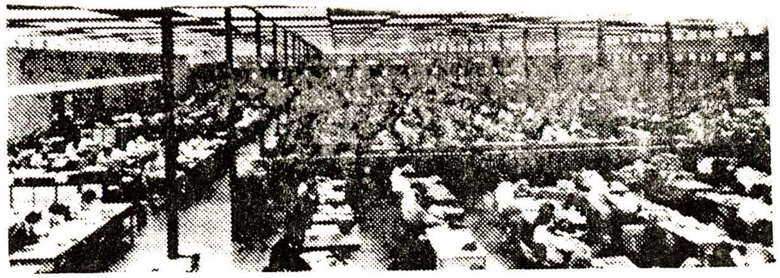
These two groups of services require two kinds of locations. The first group should be located within the community, and in such a way that people pass the various services daily. The departments in the first group, however, are not tied together, and they can be located more or less independently. The second group of departments do form a functional cluster, and they must be located together, around a common record bank. This group, however, does not require direct connection to the community, and so the cluster may be located toward the edge of the university, away from the "center of gravity". Therefore:

<u>When locating administrative services, provide two kinds of location: First, community locations - all the departments that serve a sector of the campus community directly: Locate these departments independently, each one as near as possible to the center of gravity of its particular community (e.g., Student Employment, Dean of Students in the Student Union; Counselling near student housing). Second, all the departments that are not serving the community directly, on a daily basis: Cluster these departments around a common record bank, and locate the cluster at the edge of the university, away from the community centers. Never create one, vast administrative territory, for all the departments.</u>

There may occasionally be cases where the community oriented services require contact with the records bank, serving the remote departments. Counselling, for example, will need access to university records. In these cases it is wiser for the "community" department to make the trip to the record bank once a day, or to develop a small, duplicate set of records, than to give in to the temptation to centralize the function. Staff members faced with this choice have generally agreed that the inconvenience of distant records is slight, compared to the importance of an autonomous location.

Small Services Without Red Tape

Public services don't work if they are too large. When they are large, their human qualities vanish; they become bureaucratic; red tape takes over



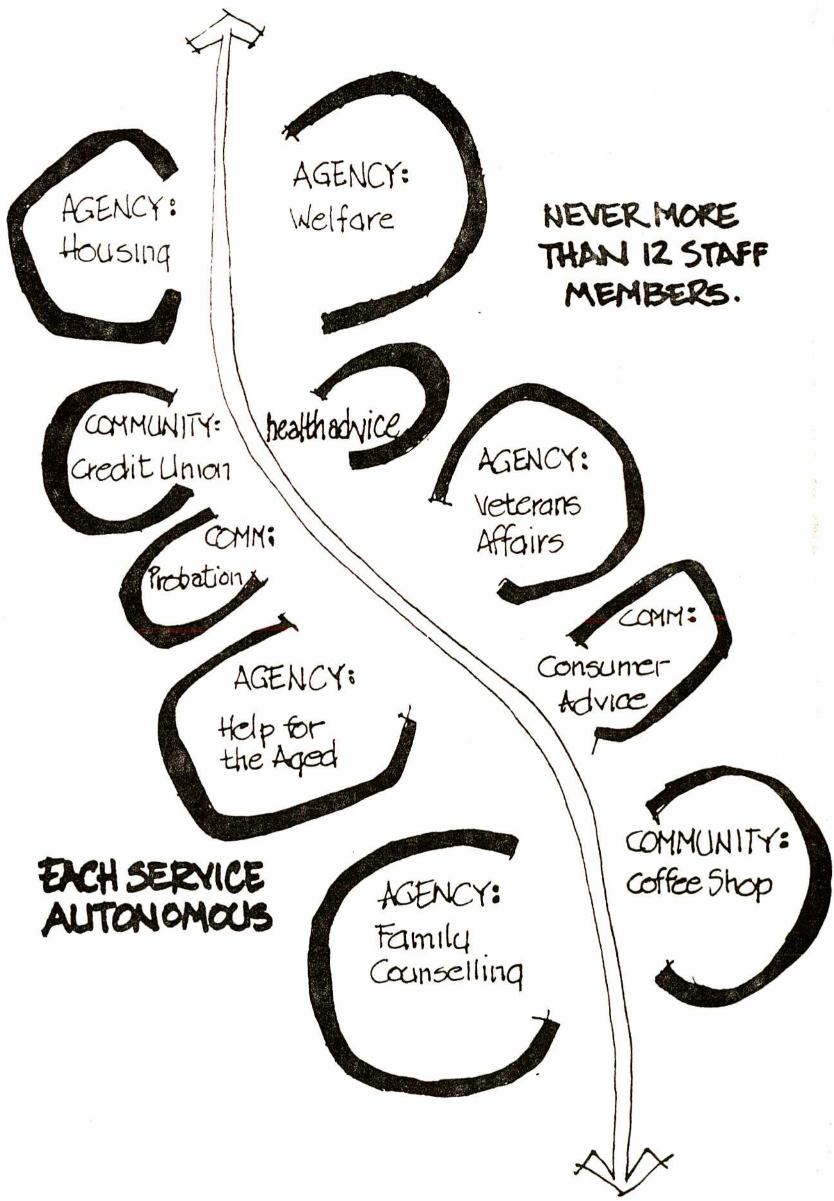
Small Services without Red Tape

Red tape can be overcome in two ways. First, it can be overcome by making each service program small and autonomous. A great deal of evidence shows that red tape occurs largely as a result of impersonal relationships in large institutions. When people can no longer communicate on a face to face basis, they need formal regulations—and in the lower echelons of the organization, these formal regulations are followed blindly, and narrowly.

Second, red tape can be overcome by changing the passive nature of the clients' relation to the service programs. There is considerable evidence to show that when clients have an active relationship with a social institution, this institution then looses its power to intimidate them. (continued over)

Therefore:

Give the services in any public service organization the following characteristics:
1. No one service more than 12 staff members, total.
2. Each service autonomous as far as possible; and housed in an identifiable, physically autonomous unit, with direct access to a public thoroughfare.
3. The services arranged in a loose informal way; so that there is no hard and fast distinction between services provided by agencies, and services which are initiated and run by members of the community.



Problem (continued)
References on the way red tape and bureaucracy work against the needs of the poor:

Gideon Sjoberg, Richard Brymer, and Buford Farris, "Bureaucracy and the Lower Class", Sociology and Social Research, 50, April, 1966, pp. 325-377. Alvin W. Gouldner, "Red Tape as a Social Problem", in Robert Merton's Reader in Bureaucracy, Free Press, 1952, pp. 410-418.

These authors identify two main features of the red tape syndrome:
1. Lack of personal relationships, size of organisation, and frameworks of rigid rules.
2. Feelings of impotence on the part of the client.

We have concluded that:
1. No service should have more than 12 persons (all staff, including clerks). We base this figure on the fact that 12 is the largest number that can sit down in a face to face discussion. It seems likely that even smaller staff size will work better still.
2. Each service should be autonomous—not subject to regulations from parent organisations outside the center. This should be emphasised by physical autonomy. In order to be physically autonomous, each service should have an area which is entirely under its own jurisdiction; including access to some public thoroughfare, and complete physical separation from other services.
3. A center should encourage the members of the community to formulate new service programs on their own initiative. (The fact that this will require extensive community organisation is dealt with in the pattern *Community Territority.*) To give these new services full support, they must be able to take their place, along with the existing services, which requires a very loose and flexible arrangement of service areas. These conclusions are reinforced by the very great variety of possible service programs. As we see from the list given in the solution (above) a center could theoretically provide as many as twenty or thirty different services. The more of these services the service center can provide, the better for its clients.

The published evidence deals with the experiences of poor people who encounter red-tape. It is almost certain, though, that the pattern holds for all income levels. The middle class is sick of red tape too.

Context
This pattern was developed originally for the services in a multi service center. It applies equally to the departments of a city hall, of a medical center, or to the local branches of a welfare program. In most of these cases the pattern would require radical changes in administrative organisation. However difficult they may be to implement, we believe these changes are required.

Critical Experiment
Ask people which public services they are very satisfied with, and which public services they are very dissatisfied with. Compare the two groups of services for size, and for the autonomy and decision making power of their staff members. We predict the smaller services are going to come out better. Does anyone have any evidence like this, one way or the other?

By: Christopher Alexander, Sara Ishikawa, Murray Silverstein.

July 1968 revised June 1970

Proximity Analysis

Everyone has to walk around a bit, during the work day. But if you have to walk too far, too often, it becomes a nuisance.

Current architectural methods often include a proximity matrix, which shows the amount of movement between different people and functions in an office or a hospital. These methods always make the tacit assumption that the functions which have the most movement between them, should be closest together. *However, as usually stated, this concept is completely invalid.*

This concept has been created by a kind of Taylorian quest for efficiency, in which it is assumed that the less people walk about, the less of their salary is spent on "wasteful" walking. The logical conclusion of this kind of analysis, is that, if it were only possible, people should not have to walk at all, and should spend the day vegetating in their arm-chairs.

The fact is, that people will work at peak efficiency only when they are healthy in mind and body. A person who is forced to sit all day long behind a desk, without ever stretching his legs, will become restless and unable to work, and inefficient in this way. Some walking is very good for you. It is not only good for the body, but also gives people an opportunity for a change of scene, a way of thinking about something else, a chance to reflect on some detail of the mornings work, or one of the crucial everyday human problems in the office.

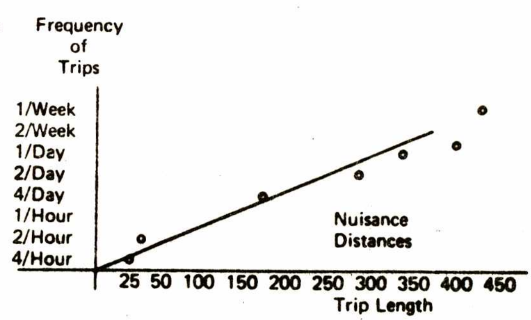
On the other hand, if a person has to make the same trip, many times, there is a point at which the length of the trip becomes time consuming and annoying, and inefficient because it makes the person irritable, and actually starts to interfere with his work. This becomes critical when a person starts avoiding trips because they are too far—but the nuisances of the repeated long trips can interfere with the working day even before that stage is reached, just by being annoying.

An office will function efficiently so long as the people who work there do not feel that the trips they have to take are a nuisance. Trips need to be short enough so they are not felt a nuisance—but they do not need to be any shorter.

The nuisance of a trip depends on the relationship between length and frequency. You can walk 10 feet to your file, many times a day without being annoyed by it; you can walk 400 feet occasionally, without being annoyed. In the following graph we plot the nuisance threshold for various combinations of length and frequency:

(continued over)

Therefore: When deciding how close together to place two parts of an office find out how often different people have to make the trip, between the two, and then make sure that the distance between them, is less than the nuisance distance for that trip frequency, according to the graph.



Note: For the purpose of these calculations, we reckon every flight of stairs as equivalent to 40 feet of horizontal distance, since stairs are more of a barrier, psychologically, than their actual length implies.

Problem (continued)

The graph is based on 127 observations in the Berkeley City Hall. People were asked to define all the trips they had to make regularly during the work week, to state their frequency, and then to state whether they considered the trip to be a nuisance.

The line on the graph shows the median of the distances said to be a nuisance, for each different frequency. We define distances to the right of this line, as *nuisance distances.* The nuisance distance for any trip frequency, is the distance at which we predict that at least 50% of all people will begin to consider this distance a nuisance.

It would be possible to define the nuisance distance, more stringently, by plotting a line further to the left. For example, it would be possible to plot a line at which we predict that 25% of all people will consider the trip to be a nuisance. However, in general, it seems hardly reasonable to base a design on such a severe restriction.

Since this graph is of the utmost importance in planning and architecture, it is highly desirable to repeat the experiment, perhaps with a larger sample.

By: Christopher Alexander, Barbara Schreiner and Ronald Walkey

October 1970

HUMAN SCALE IN PUBLIC BUILDINGS

When human organizations are housed in enormous buildings, the human scale vanishes, and people stop identifying with the staff who work there as personalities, and think only of the entire institution as an impersonal monolith, staffed with "personnel".

The question of human scale in the environment is extremely difficult to pose in empirical terms. However, despite the great difficulty, the problem is undoubtedly real: Nearly everyone has had the feeling, at one time or another, that a building, or an environment, is "out of scale", that it dwarfs the human organization within it, and makes the people feel small and impersonal.

At what scale do buildings begin to have this effect? We suspect that, in public buildings containing a large number of services, or organizations, the problem begins to occur as buildings grow larger than 3-4 storeys, and contain more than 3-4 organizations. If this is true, it means that most of the public buildings being built in cities today, are too big, and that the people who use these buildings are currently suffering from the problems created by inhuman scale.

The strongest evidence for this conjecture that we have found to date comes from a survey of visitors to public service buildings in Vancouver, British Columbia. (Preliminary Program for Massing Studies, Document 5: Visitor Survey, Environmental Analysis Group, Vancouver, B.C., August, 1970.)

With respect to the scale of the buildings, two kinds of environments were studied - old, three storey buildings, and tall modern skyscrapers. The visitors to the small buildings differed from the visitors to the skyscrapers in an extraordinary way. The people going to the small buildings most often mentioned friendly and competent staff, as the important factor in their satisfaction with the service. In many cases the visitors were able to give names, and even describe, the people with whom they had done business. Visitors to the skyscrapers, on the other hand, mentioned friendliness and staff competence rather infrequently. The great majority of these visitors found their satisfaction in "good physical appearance, and equipment".

In the skyscrapers, the visitors experience is depersonalized. They stop thinking primarily of the people they are going to see, and the quality of the relationship, and focus instead on the building, itself, and its features. In the skyscraper the staff becomes "personnel" - interchangeable and indifferent; and the visitors pay little attention to them as people - friendly or unfriendly, competent or incompetent.

We learn also from this study, that the skyscraper visitors complained frequently about the "general atmosphere" of the building, without naming specific problems. There were no such complaints among the visitors to the smaller buildings. It is as if the skyscrapers induce a kind of free floating anxiety in people; the environment "feels wrong", but it is hard to give a reason. It may also be that the cause of the uneasiness is simple - the place is too big, it is difficult to grasp, the people are like bees in a hive - and therefore people are embarrassed to say it outright (i.e., "If it is as simple as that, I must be wrong - after all, there are so many of these buildings.")

However it is, we take this evidence to indicate deep disaffection from the human environment in the skyscrapers. The buildings impress themselves upon us as things; they make us forget the people inside them, as personalities; and while we use them we complain about the "general atmosphere". We could not ask for a more perfect description of Kafka's nightmare.

What are the qualities of two, three and four storey buildings, that give them human scale, and which are lost in the taller buildings?

1. In smaller buildings, the workgroups have more autonomy; they are not part of a massive organization. The autonomy supports the development of character and personality in the group; and these human qualities can be felt by visitors.

2. The smaller buildings maintain an intimate relationship to the street. From a two or three storey building you can participate in the street scene: You can make out the faces of the people below, and they can see you; from three storeys you can shout out, and catch the attention of people in the street. In the higher buildings, the visual detail is lost, and people speak of the scene below as if it were a game, from which they are completely detached.

Furthermore, it is easier to get down to the street from the smaller buildings. This is true both physically and psychologically: The elevators in the tall buildings are a psychological barrier; they "remove" people from the pedestrian scale, and cut down the informal dropping-in that occurs in the smaller buildings.

3. On the whole, people do not identify with the tall buildings as positive symbols of the culture; and therefore beside these buildings, people feel small and powerless.

People gain stature from massive elements in their environment, when these forms have a shared, positive meaning in the culture. But the skyscrapers are different. They remind us of boring work, interlocking bureaucracy, Big Business - there is no strong positive identification. And so in scale, beside them, we feel small:

"When I was a boy looking from Palisades, I could see the hills of Inwood, Fort Tryon, and Fort Washington as the bag masses. The railroad bridge across the Harlem was interesting but small. Now all these are dwarfed by the man-made structures, the Henry Hudson Bridge, the Paterno apartments. Unfortunately, I have been unable to achieve an intimate or trusting relationship with these new foreground masses; and the hills I loved, and love, have become tiny. My place in my city is small because I do not love the things that are now big". (Paul Goodman, Five Years, Vintage Books, New York, 1969, p. 4.)

Therefore: To maintain human scale in public buildings: Make them small, not more than 3-4 storeys high; and never staff the buildings with more than 3 or 4 different groups.

Hospital Office Building

(Communication?)

Feeling of Shelter

Social Spaces Define Structure

Building Shaped for Light

Building Shaped for Light

It is our belief that the excessive use of artificial light in modern buildings is inhuman; buildings which displace natural light as the major source of illumination are not fit places to spend the day.

This is an important assertion. It has never been fully investigated, though every expert alludes to it. If it is taken seriously, it has drastic implications for the over-all shape of buildings.

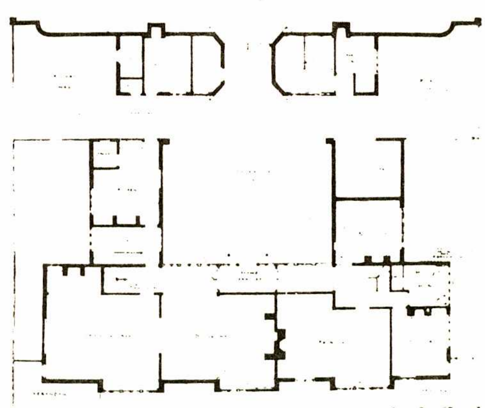
There are two kinds of reasons for believing this assertion.

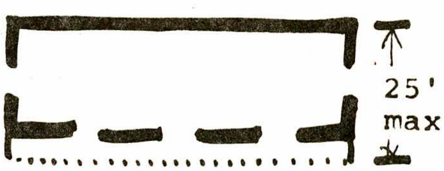
First: All over the world, people are rebelling against windowless buildings; people complain when they have to work in places without daylight; Rapoport has shown, by content analysis, that people are in a better mood in rooms with windows than in rooms without windows. (*Amos Rapoport, "Some Consumer Comments on a Designed Environment", Arena, January 1967, pp. 176-178.*) Edward Hall tells the story of a man who worked in a windowless office for some time, all the time saying that it was "just fine, just fine", and then finally quit; as Hall says: "The subject was so deep, and so serious, that this man could not even bear to discuss it, since to discuss it would have opened the floodgates".

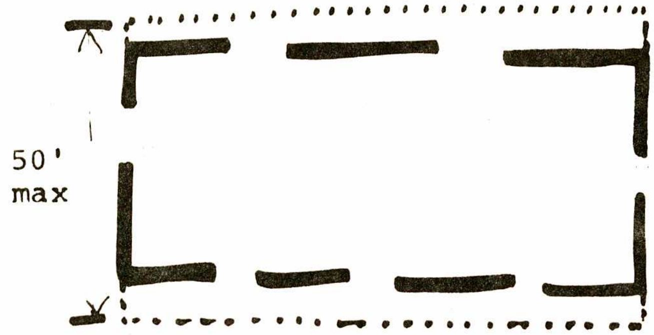
Second: People's complaints are serious—but they are easy to dismiss. It is much harder to dismiss a growing body of evidence which suggests that man actually *needs* daylight, since the cycle of daylight somehow plays a vital role in the maintenance of the body's circadian rhythms—and that the change of light during the day, though apparently variable, is in this sense a fundamental constant by which the human body maintains its relationship to the environment. (See, for instance, *R. G. Hopkinson, Architectural Physics: Lighting, Department of Scientific & Industrial Research, Building Research Station, HMSO, London, 1963, pp. 116-117.*) If this is true, then too much artificial light actually creates a rift between a person and his surroundings, and upsets the human physiology.

(continued over)

Therefore: Limit the width of buildings. Make buildings whose internal spaces are lit from two sides, up to 50 feet wide – no more. If the building's internal spaces are lit from one side only make it 20 – 25 feet wide. Take the width as a roof-line-to-roof-line measurement.







Building Shaped for Light

Problem (continued)
We have discussed the implications of this problem at the scale of individual rooms in the pattern, *Light on Two Sides of Every Room.* Now we ask, what characteristics must buildings have so that all their spaces are naturally lit?

We break this down into two questions:

1. What is the acceptable mix of natural and artificial light, where the natural light dominates throughout the day?

2. At what distance from openings does natural light become so weak that it no longer contributes to the "acceptable mix" defined in question 1?

1. As for the right mix of natural and artificial light, so that natural light will dominate, we propose the following experiment. Turn artificial lights on in rooms with varying amounts of natural light. Invite people into these rooms; after they have spent a moment there, ask them, "Did you notice that the artificial lights were turned on?" At the point where people cease to notice that artificial lights are on, but are aware only that the room is naturally lit—at this point the right mix is achieved. We conjecture that this level can only be achieved if the general illumination provided by the artificial lighting never exceeds the natural light, anywhere in the room. That is, the natural light always contributes at least 50% of the overall light level of the space.

(Note: Any task requiring visual detail may require very high levels of illumination. These tasks will naturally be located near a window, or provided with a spot supplement. The proportion above is intended to apply only to the background light level—the light which gives the room its quality as a room.)

2. To determine the distance from windows where natural light can be effective, we must first determine an acceptable minimum level of general illumination. We take the minimum level of working illumination of 10 lumens/sq.ft. (demanded by the British Statutory Building Regulations) and increase this by ten, giving a minimum illumination level at any point in a room of 20 lumens/sq.ft. This level corresponds to that found in a typical corridor, and is just below the level required for reading.

From the assumption above in 1, we know that 10 lumens of this must be from daylight. If we use the "standard sky" illumination of 500 lumens/sq.ft. (this corresponds to a dull day, introducing a margin of safety), then to achieve an illumination of 10 lumens per sq.ft. requires a daylight factor of 2%.

Experiments have shown that a 2% daylight factor can only be maintained (in a side lit room, with evenly distributed windows, and a ceiling less than 12 feet), if the actual glass area of windows is of the order of 25% of the floor area.

If we consider that the average glass opening is likely to be no greater than 60%, for reasons of reducing glare, providing multiple openings (see *Windows Overlooking Life*), and to accommodate structural components, then the maximum depth of a room which will sustain 10 lumens/sq.ft. at a point furthest from the windows can be determined to be about 25'.

This means that buildings open at one side to daylight, cannot be much deeper than 20-25'. When they are wider than this, the artificial light, of necessity, takes over.

Finally, we discuss the cost increase created by long narrow buildings. A long narrow building has a larger perimeter per unit area than a square building. How big is the difference? The following figures are taken from a cost analysis of standard office buildings, used by Skidmore Owings and Merrill, in the program BOP (Building Optimization). These figures illustrate costs for a typical floor of an office building, and are based on costs of $21/sq.ft. for the structure, floors, finishes, mechanical, etc., not including exterior wall, and a cost of $110/running foot for the perimeter wall.

Area (Sq.Ft.)	Shape	Perimeter Cost ($)	Perimeter Cost Per Sq.Ft. ($)	Total Cost Per Sq.Ft. ($)
15,000	120x125	$54,000	3.6	24.6
15,000	100x150	55,000	3.7	24.7
15,000	75x200	60,500	4.0	25.0
15,000	60x250	68,000	4.5	25.5
15,000	50x300	77,000	5.1	26.1

We see then, that at least in this one case, the cost of the extra perimeter adds very little to the cost of the building. The narrowest building costs only 6% more than the squarest. We believe this case is fairly typical, and that the cost savings to be achieved by square and compact building forms, have been greatly exaggerated.

By: Christopher Alexander, Barbara Schreiner, Murray Silverstein and Ronald Walkey.

October 1970

This pattern is tentative. If you have any evidence to support or refute its current formulation, please send it to the Center for Environmental Structure, P.O. Box 5156, Berkeley, California 94705; we will add your comments to the next edition.

Horizontal Office Buildings

When an organization occupies many different floors of a multi-storey building, communication between staff on different floors is shot.

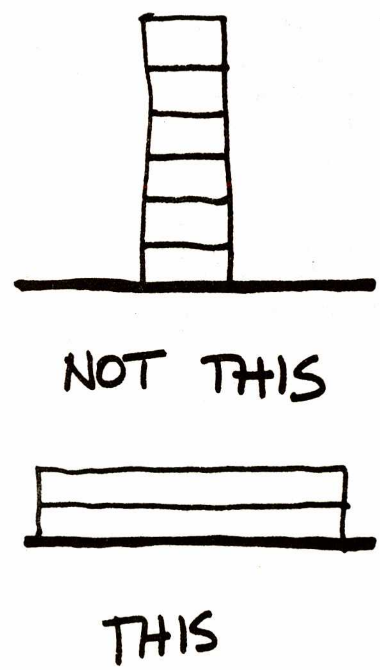
Every organization depends on informal communication between its various departments. The formal messages that pass between departments are only a small part of the "glue" which actually holds an organization together. A much larger part of the work that gets done hinges on human relationships. When people are getting along well, and when they understand each other, the organization functions smoothly. When people stop understanding each other, and try to do business on a purely "business" basis, the smooth functioning of the organization falls apart.

The creation of proper human relationships depends most on chance, informal, casual contact between people. A smile, a good morning, a chance to discuss a misunderstanding while in the corridor, a shared idea during a coffee break, these are the moments that make a healthy organization work. In short—a healthy organization requires a great deal of casual, informal contact among people from different departments. (See, for instance, *Bernard M. Bass, Organizational Psychology, Allyn and Bacon, Inc., Boston, Mass., 1965.*)

The amount of contact between staff members in different departments, depends greatly, on the floors they occupy. This is a part of everyones common experience. You get to know the people working on your floor much better than the people working on other floors.

(continued over)

Therefore: Make all office buildings horizontal. If possible keep them down to two storeys in height. Where land values force the creation of high office buildings, still keep the emphasis of building horizontal, and make sure that the floors are as large as possible, so as to minimize the number of organizations that have to spread themselves over more than two floors.



Horizontal Office Buildings

Problem (continued)
A study by Marina Estabrook and Robert Sommer, shows the effect dramatically. Estabrook and Sommer studied the formation of acquaintances in a three-storey university building, where several different departments were housed. They asked people to name all the people they knew in departments *other* than their own.

Their results:

Percent of people known:	When departments are:
12.2%	on same floor
8.9%	one floor apart
2.2%	two floors apart

People knew 12.2% of the people from other departments on the *same* floor as their own, 8.9% of the people from other departments *one* floor apart from their own floor, and only 2.2% of the people from other departments *two* floors apart from their own.

In short—by the time two departments are separated by two floors or more, there is virtually no informal contact between the departments.

Since human organizations depend, to the extent underlined in the first paragraph, on informal contacts between departments, it seems essential to try and house organizations in buildings which have one or two storeys, but no more.

By: Christopher Alexander
Contribution By: Robert Sommer and Marina Estabrook
October 1970

DRAFT

UNIVERSITY PARKING

As the university grows, there is a great danger that parking will overwhelm the university environment. But if the parking is too far away, it can easily degrade teaching and learning.

So long as a university is small, most of the faculty and students can find a place to live within a fifteen minute walk, so they can easily walk to work. As the university population grows, even though housing densities go up, many faculty and students who cannot find cheap enough housing within a 15 minute walk, are forced by the high price and scarcity of housing, to move out beyond the 15 minute radius. At that distance it becomes almost impossible for them to walk to work. Unless there is public transportation available, they have to drive to work. Hence the parking problem.

We start by estimating the demand for parking. There are essentially three kinds of parking demand: commuter parking for faculty and staff, student parking, and short term parking. We have argued elsewhere that all student housing must be within walking or biking distance of the university, since parking spaces on campus must be paid for, and it is virtually impossible for more than a few students to pay the very high parking rates which will be required (Students Close to Campus). We therefore limit our discussion to the parking required for faculty and staff commuters, and for short term needs. We shall also assume that there is no public transportation: although it can, of course, be argued that here and elsewhere, that there ought to be public transportation, to reduce the parking problem.

The number of commuter spaces required to serve a given building depends on two parameters: N, the number of staff offices in the building, and P, the percentages of university staff who live within 15 minutes walk of the campus. Estimates made by the University of Oregon Office of Planning and Institutional Research, suggest that there must be one parking space for every ten staff who live within 15 minutes (because the majority will walk), and two parking spaces for every three staff who live more than 15 minutes walk away. This means that a building with N work stations, requries $N(0.1P + 0.67(1-P)) = N\ (0.67 - 0.57P)$ parking spaces for commuter parking.

The number of spaces needed to serve short term needs is related to M, the number of work stations in the building. This number includes all staff and faculty offices, but also includes all work stations in libraries, computer centers, research laboratories, meeting rooms in the student union, and so on. All these kinds of work stations generate quick pick up and drop off traffic, and require short term parking. We have not yet had the opportunity to study the volume of short term parking, but we guess that a building with M work stations needs about M/40 short term parking spaces.

We have defined the amount of parking which a building needs. Now, how close to the building must this parking be. This is a critical question. If it is too close, it may be impossible to satisfy the other patterns (Small Parking Lots, Nine Percent Parking, etc.) which protect the quality of the environment. If it is too far it will be very inconvenient, and if it is altogether too far it will simply not be used. We must find distance for the parking which brings these opposing factors into balance.

The pattern Critical Parking Distance (Ron Walkey, Center for Environmental Structure, 1970), tells us that short term parking must be within 300 feet of the destination in order to be useful. (If it is more than that, people will often keep cruising, in the hope of finding a closer space). It tells us also that commuter parking distance depends on the population of the city. People are willing to walk further, in large cities. The distance varies from 400 feet, in a city whose population is 25,000, to 650 feet in a city whose population is 200,000, to 800 feet in a city whose population is 800,000. These figures are supported by a study of parking price done at the University of Oregon, which show that people are willing to pay as much as $100 per year for a parking space, provided that this space is well lcoated from their point of view. The three parking lots in which people are willing to pay $100/year, are all within 500 feet of the workstations they serve. It is extremely important that parking spaces should be within this range, since the type of parking needed to maintain the quality of the university environment, will be expensive, and will have to be paid for by its users. Parking lots which are more than about 1000 feet from the workplaces they serve are not only given a very low price, but are also almost deserted. It serves no purpose to place parking too far from the workplaces it serves.

One final comment. A university is first and foremost a pedestrian precinct. People walk between buildings; walking, sitting, strolling, are an essential part of the relaxed and thoughtful atmosphere required for learning. To preserve this pedestrian quality, we suggest that the parking spaces associated with any given building, should always be placed on the side of the building which is furthest from the university center, and <u>as far away from the building as possible</u>, within the distance limits stated above.

This will guarantee that parking tends to concentrate towards the edges of the university, and leaves the center free of cars. Therefore:

For every building with N staff offices, and M workstations, provide 0.25 M metered short term spaces, 300 feet from the building, in the direction away from the university center; and provide N90.67 - 0.57P) commuter spaces 500 feet away from the building, also in the direction away from the university center.

Two points concerning implementation.

First, it is necessary for people to have stickers which identify the exact parking lot where they may park. Without such stickers, people will try to park in lots which are less than 500 feet from their own building, but which are in fact intended to serve some other building that is closer to the center.

Second, whenever a new building is built, the parking, which meets this pattern - i.e. 500 feet away from the center - must be built at the same time. If it is impossible to find parking space, which meets this pattern, and is also compatible with the other parking patterns (especially 9%) then the building may not be built in that position.

DRAFT

NINE PERCENT PARKING

When the area devoted to parking is too great, it destroys the land.

Very rough empirical observations lead us to believe that it is not possible to make an environment fit for human use, when more than 9% of it is given to parking.

These observations are very tentative. We have yet to perform systematic studies; and our observations rely on our own subjective estimates of cases where "there are too many cars" and cases where "the cars are alright". However, we have found, in our preliminary observations, that different people agree to a remarkable extent about these estimates. This suggests that we are dealing with a phenomenon which, though obscure, is nonetheless substantial.

For the reader's benefit, here are two examples of environments which have the threshold density of 9% parking. One is a typical medium density suburb, with 8 houses per gross acre, and 1½ cars per house. This has 12 cars/acre, which uses just about 9% of the land. The other is the quadrant of the University of Oregon, illustrated below, bounded by the education building, the music school, the cemetery and the outer end of the tennis courts. In this area, 10% of the land is given to parking. Many people we have talked to feel that this area is beautiful now - but that if any more cars were parked there, it would be ruined.

What is the possible functional basis for this intuition. We conjecture that the following: People feel, subconsciously, that the environment is the medium for their social intercourse. It is the environment which, when it is working properly, creates the potential for all social communion, including even communion with the self.

We suspect that when the density of cars passes a certain limit, and people experience the feeling, subjectively, that there are too many cars, what is really happening is that subconsciously they feel that the cars are overwhelming the environment, that the environment is no longer "theirs", that they have no right to be there, that it is not a place for people, and so on. After all, the effect of the cars reaches far beyond the mere presence of the cars themselves. They create a maze of driveways, garage doors, asphalt and concrete surfaces, and building elements which people cannot use. When the density goes beyond the limit, we suspect that people feel the social potential of the environment has disappeared; instead of inviting them out, the environment starts giving them the message that they should stay indoors, that they should stay in their own buildings, that social communion is no longer permitted or encouraged.

We have not yet tested this suspicion. However, if it turns out to be true, it may be that this pattern, which seems to be based on such slender evidence, is in fact one of the most crucial patterns there is, and that it plays a key role in determining the difference between environments which are socially and psychologically healthy, and those which are unhealthy.

It seems, then, that environments which are human, and not destroyed socially or ecologically by the presence of parked cars, have less than 9% of their ground area devoted to parking space. Therefore:

Never allow parking lots and garages to cover more than nine percent of the land.

It is essential to interpret this pattern in the strictest possible way: namely, that the parking generated by any parcel of land, must be taken care of within that parcel. The pattern becomes meaningless, if we allow ourselves to place the parking generated by a piece of land A, on another adjacent peice of land B, thus keeping parking on A below 9%, but raising the parking on B, to more than 9%. In other words, each piece of land must take care of itself; we must not allow ourselves to solve this problem on one piece of land, at the expense of some other piece of land.

What about underground parking. May we consider it as an exception to this rule. We may, provided that the presence of the underground parking does not violate or restrict, the use of the land above the parking garage. If, for example, the parking garage is under a piece of land which was previously used as open space, with great trees growing on it, then the garage will almost certainly change the nature of the space above because it will no longer be possible to grow large trees there. This parking garage would not be allowed as an exception. Similarly, if a garage is under a building, and the structural grid of the garage (60' bays) constrains the structural grid of the building above, so that this building is no longer free to express its needs, then once again, this garage will not be allowed.

On the other hand, an underground parking garage _is_ allowed as an exception to the rule, if it does not constrain the land above it - this may be true in the case where a garage is under a major road, or if it is under a playing field or tennis court, or if it is under a building made in such a way that the structure is not constrained.

The nine percent rule, has a clear, and immediate implication, for the balance between surface parking and parking in garages, at different parking densities. This follows from simple arithmetic. Suppose, for example, that an area requires 20 parking spaces per acre. Twenty parking spaces will consume about 7000 square feet, which would be 17% of the land, if it were all in surface parking. To keep 20 cars/acre in line with the 9% rule, at least half of them will have to be pared in garages. The table below gives similar figures, for different densities:

Cars per acre	% on surface	% in two storey garages	% in three storey garages
12	100	-	-
17	50	50	-
23	50	-	50
30	-	-	100

DRAFT

PARKING STRUCTURES

Large parking structures full of cars are inhuman and dead buildings - no one wants to see them or walk by them.

One of the most difficult problems to solve in planning any urban environment is that of satisfying the parking needs without completely wrecking the environment. Parked cars are unpleasant - they generate no life and they take up immense amounts of space.

When the amount of required parking is very high, parking structures help the problem - they concentrate the parking and put much of it out of view. But this is not enough - they are still very unpleasant to see and walk by, they are essentially dead buildings.

Several steps must be taken to solve the problem:

1. The ground level portions of the structure along pedestrian paths must be given over to life generating activities such as shops and offices. Since the need for parking goes hand in hand with commercial development, this idea also makes good economic sense: in most cases, the value per square feet of ground floor commercial spaces is considerably higher than the value per square feet of parking spaces. Time Saver Standards (Callender, 4th Edition, McGraw-Hill, page 1240-1241) supports this idea: "As an example of first floor rentals, a garage in Cincinnati takes in more than $150,000 in annual rentals from ground floor tenants".

There are many examples of multi-level garages with shops and offices on the ground floor - the Ellis-O'Farrell Garage and the Sutter-Stockton Garage, are two examples in San Francisco. An especially fine example is a relatively small new parking structure just recently built in Berkeley on Durant Way near Telegraph Avenue. This garage has shops on the ground floor, so that the life at the pedestrian level is completely unbroken by parking, and the three upper floors of parking is hidden behind brick arched "windows", so that one is completely unaware of the building as a parking structure.

2. The car entrance to the garage must be on an arterial, at an edge of the pedestrian precinct, so that traffic generated by the garage does not destroy local roads around it, and so that pedestrian precincts are kept safe and pleasant for pedestrians. Pedestrian entrances to the garage should be on the pedestrian side of the garage, away from the artery. While the garage may be open to the arterial, for light and air, it should be closed and invisible from the pedestrian sides of it.

3. The top surface of an underground garage should not be a parking lot - but should either be left as open space, or built upon. However, large trees should not be expected to grow on top of garages. The smallest of trees require at least 4 feet of fill.

4. The garage should be as small as possible - a garage above ground should never be too high. No matter how much pedestrian level activity there might be, if there was too much parking behind the shops or on upper stories, the structure would have a deadening effect on the environment around it. <u>Time Saver Standards</u> says the following with respect to size of garages: "...the lot should be about 100 by 200 feet or 120 by 130 feet for building the most economical unit. Today, multi-level structurds must rise at least three floors in order to make the per car cost reasonable. Usually the cost of construction of a single floor for parking above the essentially costless ground floor raises the per-space cost to uneconomic levels".

Thus, where parking needs are high, build parking structures at the edge of the pedestrian precinct, with car entrances only off arterials. Line the ground level portion, along pedestrian paths with shops and offices, and never make the parking structure much larger than 120 x 130 feet, and never more than three levels above ground. Make underground structures so that the ground floor level is either open space or built upon - never parking. Never put an underground parking garage under open spaces which have large trees on them.

VERY ROUGH DRAFT

SMALL PARKING LOTS

Vast parking lots wreck the land for people.

Large parking lots have a way of taking over the landscape, creating unpleasant places, and having a depressing effect on the open space around them.

This is due to their size - a car is so much bigger than a person. A large parking lot, suited for the cars, has all the wrong properties for human scale. It is too wide, too much pavement, no places to linger. (In fact, people speed up when they are walking through such places, to get out of them as fast as possible. Experiment.) And yet these are the kinds of open spaces that are filling up the environment.

From "Cars Surround Pedestrian Island" we have the idea of the lots at the periphery of precincts, as edges for defining the precincts. Now we propose that the form of parking along this periphery should be a collection of enclosed, small lots.

If more than 8-12 cars are visible in one lot, they are perceived as a number of cars, as many cars; less than 8-12, we see them as one thing, a small parking lot. (Old Tiny Parking Lots argument.)

Thus, a lot is defined as enclosed parking for 8-12 cars. To reduce the circulation space in such a small lot, they should be dead ends: one way in and out. This makes it essential that a driver be able to see if any spaces are available before he pulls into the lot. Thus, we shape the lots for scanning: the lot is open to a thin spine road, from which you can see all the spaces.

Variation on pattern for Green Streets applies here. (Perhaps should be taken as another pattern): The parking lots are generally overpaved; to make them really feel like human areas to which cars are fitted, the paving should be restricted to a minimum; exactly where parking and circulating occurs, all the rest is earth and paths.

Mak~~ing~~e parking lots small, for 8-12 cars; when a lot requires more parking, it is built up as a collection of these 8-12 car lots, along a spine. Each lot is bounded and enclosed with wall, hedge, trees; not visible from the outside. Each lot is deadend, you cannot drive through it. The collection of lots is open and angled to the spine so you can scan it, for spaces, without entering. So that adjacent parking lots do not create the impression of an agglomeration, no one lot may be within 100 feet of another, unless there is a building in between.

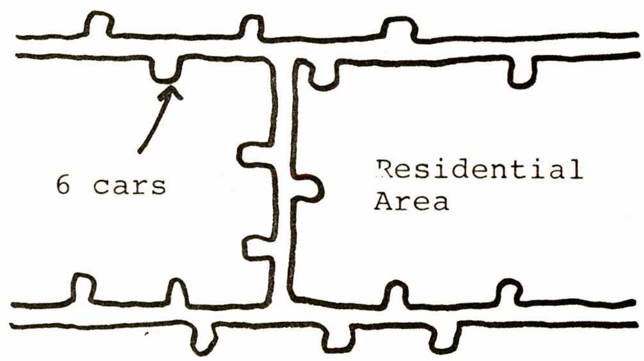
Also: The lots open to pedestrian paths, forming gateways to the pedestrian precinct. Minimum paving within the lots - many places where earth and paths wrap around the paving. No through pedestrian paths through the lots; the pedestrian paths out of the lots are branches from a main pedestrian trunk.

Tiny Parking Lots

Large parking lots aggravate the feeling that cars are dominating our environment.

Large parking lots create an impersonal, institutional atmosphere. They make the pedestrian feel dominated by cars; they separate people from the pleasure and convenience of being near their cars; and, if they are large enough to contain unpredictable traffic, they are dangerous for children, since children inevitably play in parking lots.

It is hard to pin down the exact size at which parking lots become too big. Our informal observations suggest that parking lots for four cars are still essentially pedestrian and human in character; that lots for six cars are acceptable; but that any area near a parking lot which holds eight cars, is already clearly identifiable as "car dominated territory". (continued over)



Therefore: Break up parking lots in residential communities to separate tiny parking lots each holding no more than six cars.

Problem (continued)
This may be connected with the well-known perceptual facts about the number seven. A collection of less than 5-7 objects can be grasped as one thing, and the objects in it can be grasped as individuals. A collection of more than 5-7 things, is perceived as "many things". *(See G. Miller, "The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information", in D. Beardslee and M. Wertheimer (eds.) Readings in Perception, New York, 1958, esp. p. 103.)*

It may be true that the impression of a "sea of cars" first comes into being with about seven cars.

Critical Experiment:
Look at parking lots of different sizes. Notice which sizes are so big as to give you an impression that you are in a car-dominated environment, and notice what sizes are small enough so that the cars do not seem more important than anything else around you. Try to determine the threshhold.

Context
This pattern applies only to parking lots exposed to pedestrians. It is especially crucial in keeping residential areas "residential", i.e., human. The principle (not the pattern) should however apply to downtown areas too: Inasmuch as the number of cars in parking lots would have to be much larger, something should be done to play the cars down. The lots should be somehow sunken, covered or hidden.

By: Christopher Alexander, Sanford Hirshen, Sara Ishikawa, Christie Coffin, Shlomo Angel.

August 1969 revised May 1970

[illegible]

Looped Lead Roads

Cross Diamond Pedestrian Islands

Nobody wants through traffic going by their houses.

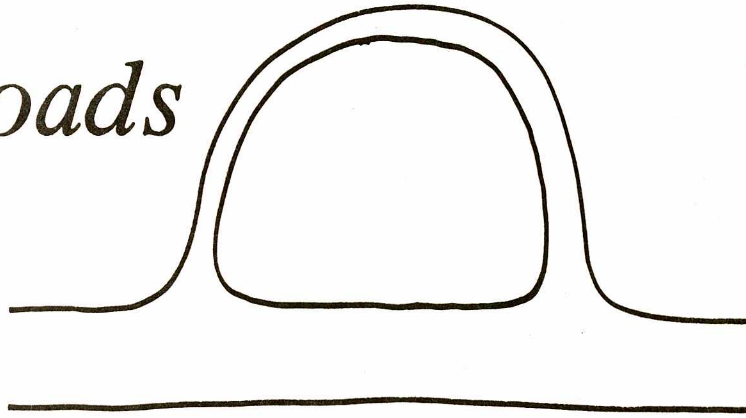
Through traffic is fast, noisy and dangerous. At the same time cars are important, and cannot be excluded altogether from the areas where people live. Local roads must provide access to houses, but prevent through traffic from coming through.

This problem can only be solved if all roads which have houses on them are laid out to be "loops". A loop road is defined as any road in a road network, so placed that no path along other roads in the road network can be shortened by travel along the "loop".

The loops themselves must be designed to discourage high volumes or high speeds: this depends on the total number of houses served by a loop, the road surface, the road width, and the number of curves and corners. Our informal observations suggest that a loop is, and feels, safe so long as it serves less than 50 cars. At this level, there may be a car every two minutes at rush hour, and far fewer during the rest of the day. The number of houses served will vary, according to the average number of cars per house. At 1½ cars per house, such a loop serves 30 houses; at 1 car per house 50 houses; at ½ car per house, 100 houses.

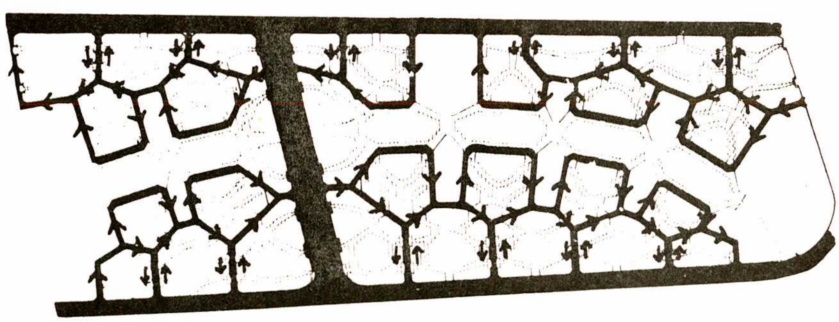
(continued over)

Looped Local Roads

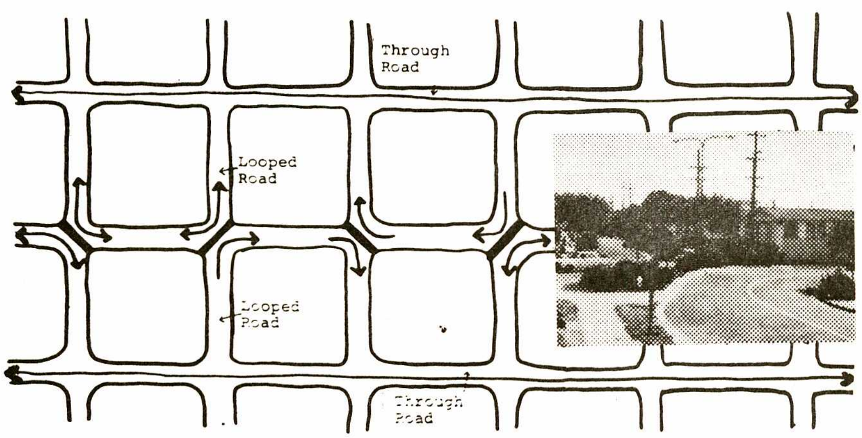


Therefore:

Place all local roads in the network in such a way that they form loops, no one loop serving more than 50 cars.



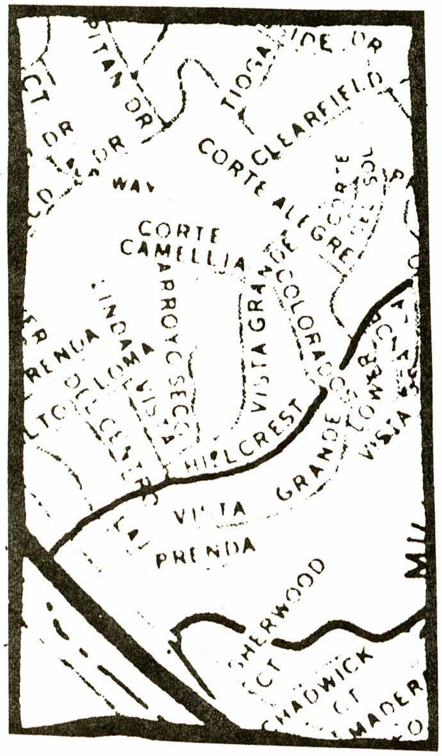
Here is an example of an entire system of looped local roads, designed for a community of 1500 houses in Peru.



Even a simple grid can be changed to have looped local roads.

Looped Local Roads

Problem (continued)
This map looks as though it has looped roads. Actually, *only one or two* of these roads are "looped" in the functional sense defined.



By: Christopher Alexander, Sanford Hirshen, Sara Ishikawa, Christie Coffin, Shlomo Angel.

August 1969 revised June 1970

DRAFT

CRUISING LOOP

The predominate use of cars demands that travelling in cars be considered a real way of experiencing the environment.

In current planning, there is a tendency to keep shunting cars and everything that has to do with cars away on the outskirts of things. This comes about in trying to preserve the environment for pedestrians, and to make it safe, pleasant and human again.

The intention is good, but we should be aware of one thing: We stubbornly continue to use our cars. The consequences are that our experience of the environment becomes more and more limited to the outskirts of things, and the center of the community gets more and more robbed of the life that cars and the people in them generate.

Let us discuss these two consequences separately:

Cars already separate the people inside of them from the surrounding environment because of the glass and steel between them, and because of the speed at which cars move. To remove cars to the outside of community activity makes the problem of separation between people in cars and the community even more serious. It is hard to measure the effect of this, but we guess that it has serious consequences on society as a whole - people's preception of the world around them becomes less acute and they become more and more unrelated and distant from society as a whole.

The other problem is that the community itself tends to break apart when all roads are outside the center of it. We have all experienced driving between two places everyday. We tend to take the same route, and if this route does not include the center of the community, we tend to lose touch with the community as a whole. An example of this problem is found at the campus at Berkeley. In order to keep cars out of the center of campus, the roads are organized so that there are very short roads leading into the parking lots around the periphery of the campus. If one teaches biology, one enters the campus on the west side, and parks in a lot there, walks a hundred feet or so deeper into the campus to the biology building; and at the end of the day walks back to the car and drives out the same gate, never having even gotten a glimpse of what is going on at the center of campus, a few hundred feet on the other side of the biology building. The Berkeley campus at this point, is no longer a community - no one has a sense of the campus as a whole anymore.

It is interesting to note that before this system of traffic was installed it was possible to drive through campus. Even if through traffic was not allowed to enter the campus, during regular working hours of the week, it was at least possible to cruise through the campus on weekends and in the evenings. Students were then able to show visiting parents what the campus was like, or simply to take a drive to see what was going on, as a break from their studies during these off-hours.

Thus the road system in a community, can break it apart or it can hold it together. How can it hold it together given the many problems that cars represent?

The most serious problem that cars impose on a community is created by through traffic. Through traffic brings unwanted traffic into the community and creates the most danger and noise. Local traffic is not as serious a problem since it is not as excessive; it is slower; and very importantly, the people in the cars are part of the community - they are familiar with it, and they care about it.

The pattern, Looped Local Roads, proposes that all roads inside neighborhoods be looped to keep through traffic out of neighborhoods. We propose in this pattern, that these loops penetrate into the community, so that each one touches the center or some common part of it.

This allows the following:

1. People driving to any part of the community, gets a chance to see what is going on in the main part of it. The hypothesis is that if you are in touch with the center of the community your chances of feeling as though you are in touch with the community as a whole is greatly increased.

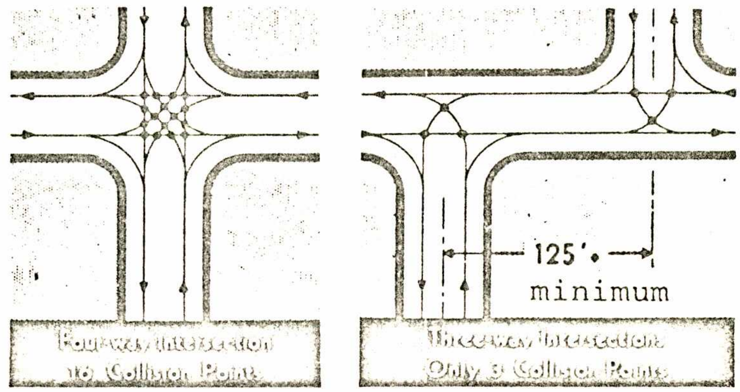
2. The community as a whole in turn is held together, and the activity at the center is increased by the presence of people in cars.

3. People have a chance to cruise through the community - to keep in touch with it; to show it off to visitors. In this way pride and interest in the community is enhanced. Loops are in this respect, not as good as roads which go through the community, but again, the crucial aspect here is that the loops touch the center, so that in cruising, one may take one loop or as many loops as one likes, but on any one of them have contact with the center of things. The activity of cruising will be greatly helped if there was a common landmark visible from each loop (like a campanile) to orient oneself (and visitors) to.

To make these loops work, they must not be too long so that it becomes a nuisance to get anywhere on them. In addition, they must be one way continuous loops, not cul-de-sacs, to make them safer, and more interesting. People driving do not mind a deviation of two minutes. At a speed of 20 miles an hour, this means that a loop can be 20 miles/60 minutes x 2 minutes, or 2/3 of a mile long.

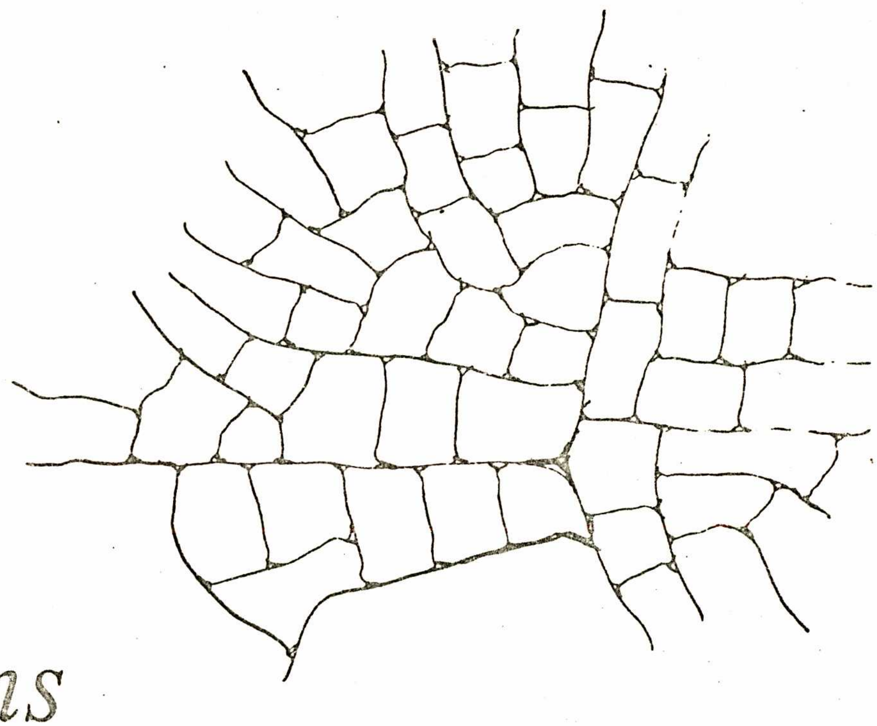
Therefore: <u>In any neighborhood make the road system, loops (see Looped Local Roads), so that each loop is one way continuous (not cul-de-sacs), and so that each one touches the center or some common part of the neighborhood, and is never more than 2/3 mile long</u>.

Traffic accidents are far more frequent where two roads cross, than at T-junctions.



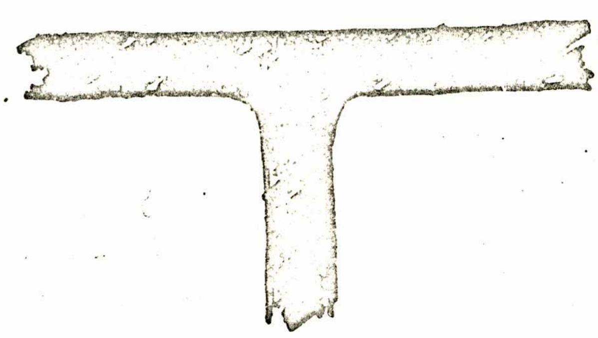
This follows from the geometry. Where two two-way roads cross, there are 16 collision points, compared with 3 for a T-junction. *(John Callendar, Time Saver Standards, Fourth Edition, New York, 1966, p. 1230.)*

Further evidence shows that the T-junction is safest if it is a right-angled junction. When the angle deviates from the right angle, vision is less good, and there is confusion about right of way. Accidents increase. *(Swedish National Board of Urban Planning, "Principles for Urban Planning with Respect to Road Safety", The Scaft Guidelines 1968, Publication No. 5, Stockholm, Sweden, p. 11.)* Even a whole network can be done with T-junctions.



T-Junctions

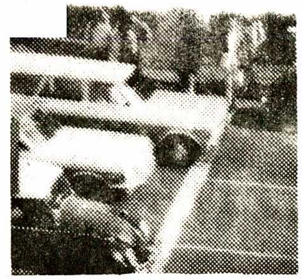
Therefore:
Make all intersections not served by a traffic light, T-junctions, with the angle as near 90° as possible.



Paths Intersecting Roads

Paths Interrupt Roads

Pedestrian crossings are obstacles to pedestrians and throughways to automobiles—the car rules over people.



In many places, it is recognized by law that pedestrians have the right-of-way over automobiles. Yet at the crucial points where roads and walkways cross, designers invariably give priority to automobiles. They make the smooth, fast road continuous, interrupting the pedestrian walkway at the junctions. This continuous road surface actually implies that the car has the right of way.

What should crossings be like to accommodate the needs of the pedestrians?

The way a path crosses a road, depends on traffic density. If the traffic density is very low, it is safe to let people cross where they want to. If the traffic density is high, the crossing has to be specially defined.

The main problem for pedestrians trying to cross a heavily travelled road, is the width of the roadway. Buchanan has shown that the average waiting time, and the percentage of pedestrians who are forced to wait, for various levels of traffic flow, is greatly affected by the width of the road. *(Colin Buchanan, et al, Traffic in Towns, HMSO, London, 1963, pp. 203-213.)* The road and the lanes themselves, should therefore narrow to the width of the through lanes. Any crossing more than three lanes wide, should be split in two. This not only keeps the crossing distance at a minimum, but it enables the pedestrian to get beyond the visual barrier of parked cars for a clear view down the length of the roadway.

The fact that pedestrians feel less vulnerable to cars when they are about 50 centimeters above them, has been discussed in the pattern, *Pedestrian 50 cm Above Car.* The same principle applies, even more powerfully, where pedestrians have to cross a road. The pedestrians who cross, must be extremely visible from the road. Cars should also be forced to slow down when they approach such a crossing. If the pedestrian way crosses 6-12 inches above the roadway, and the roadway slopes up to it, this satisfies both requirements. The slope may not be too steep, since this would be dangerous to traffic, and make the pedestrians invisible as the car nose rides up. A slope of 1 in 6, or less, is safe from both points of view. This kind of crossing is somewhat elaborate. It is probably only appropriate where pedestrian traffic is unusually heavy—for example at a corner where a great deal of pedestrian traffic is generated by the entrance to a school, or a transit station.

To make the crossing even easier to see from a distance, and to give weight to the pedestrian's "right to be there", the pedestrian path could be marked by a canopy at the edge of the road.

Finally, bus stops, vendors, shops, grow naturally around a place where a pedestrian path crosses a road. There must be enough room for these activities on both sides of the crossing, and for the parking, standing, loading and unloading that go with them.

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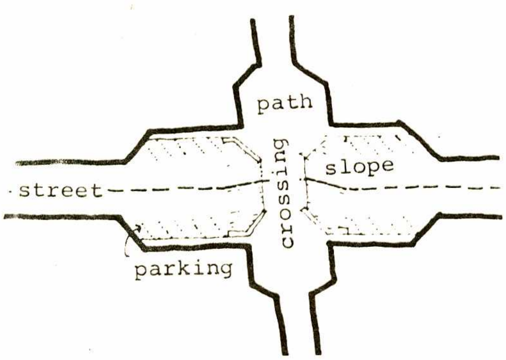


Therefore:

1. Narrow the road to the length of the through lanes at the crossing.

2. If the road is more than 3 lanes, split it, and provide an island in the middle.

3. Keep the pedestrian path at a constant level through the crossing, 6-12 inches above the road surface, and slope the road up to it—with a slope not greater than 1 in 6.

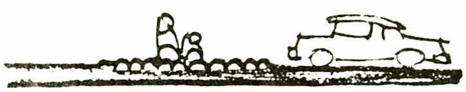
4. Swell out the pedestrian path on both sides of the crossing to make space for kiosks, benches, vendors, etc.

Paths Interrupt Roads

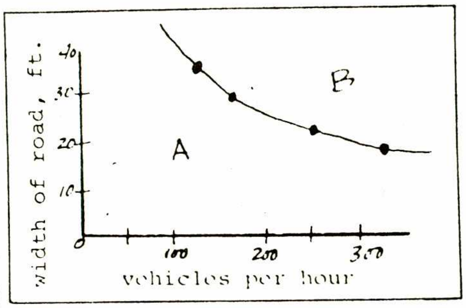
Problem (continued)
A less extreme solution, to be used perhaps at less important intersections would be to modify the roadway's texture along the approach to the crossing. Rougher texture gives the driver three kinds of warning: a) it alters the dynamics of the car giving a different "feel" to the roadway; b) the sound of the car passing over the road is noticeably different; c) it gives the roadway a different visual appearance. All of these cues combined will be incentive for the driver to slow down and become more alert. The length of this textured section will depend on the speed limit of the road. For 25 mph, it will be 62 feet on either side of the crossing; for 35 mph—105 feet and so on according to the following table from the *California Drivers Handbook, California Office of State Printing, April 1970, p. 15:*

25 mph	62 feet
35 mph	105 feet
45 mph	160 feet
55 mph	225 feet
65 mph	302 feet

The use of bumps or textured roadways for slowing people down is demonstrated in railroad crossings. Highways are now using rough and noise generating textured surfaces to slow drivers down for off-ramps and for sections of the highway where lanes merge. They are apparently effective alarms; some of them generate noises and vibrating sensations inside the car.



Context
This pattern applies to road crossings where pedestrian density is apt to be fairly high and where traffic is also fairly heavy. It does not apply to local residential roads where both are low. It does not apply to crossings where pedestrian density is high and traffic low, since under these conditions the pedestrians have no trouble competing with cars. The pattern only applies to situations where the pedestrian is "threatened". Buchanan defines a situation where a pedestrian is threatened, in terms of the delay he experiences while waiting for a gap in the traffic: "when 50% of pedestrians are liable to experience delay the average delay to *all* is about two seconds. The corresponding average delay to those who are actually delayed would in this case amount to 4 seconds. It is generally considered that, at about this point, the pedestrian's freedom to cross the road anywhere he pleases in accordance with his own judgement needs to be curtailed, and that canalisation of pedestrians onto some kind of controlled crossing is required. We think that an average delay to all crossing pedestrians of two seconds may be taken as a very rough guide to the border-line between acceptable and unacceptable conditions. Any greater delay would imply that most people (more than 50%) would have to adapt their movements, to give way to motor vehicles—a situation clearly not compatible with the idea of an environmental area." *(p. 204) Buchanan, op.cit.* His data for this borderline condition is presented below. If a particular roadway of width, W, carrying a volume of traffic, VPH, lies in region B, then a special pedestrian crossing is required.



Region A — Pedestrians free to cross anywhere.
Region B — Some form of controlled crossing desirable.

By: Christopher Alexander, Sanford Hirshen, Sara Ishikawa, Christie Coffin and Shlomo Angel.
Contribution By: Ronald Nicolino.

August 1969, revised September 1970

This pattern is tentative. If you have any evidence to support or refute its current formulation, please send it to the Center for Environmental Structure, P.O. Box 5156, Berkeley, California 94705; we will add your comments to the next edition.

ACCESS TO A GREEN

<u>When people live and work extremely close to large open green areas, they visit them and use them often; but even a fairly short distance will discourage them</u>.

People often want to get away from whatever they are doing - they naturally look for outdoor spots where they can relax and take a break - a quiet corner, a glade of trees, a lawn, a meadow. In cities, we try to meet this need for green places by providing parks. But parks, as they are usually conceived, don't really meet the need - they are simply too far apart, too far from the people who need them.

In order to study this problem we visited a small park in Berkeley, California, and asked 22 people who were in the park how often they came to the park, and how far they had walked to the park. Specifically, we asked each person three questions:

a. Did you walk or drive?

b. How many blocks have you come?

c. How many days ago did you last visit the park?

On the basis of the first question we rejected 5 subjects who had come by car or bike. The third question gives us, for each person, an estimate of the number of times per week that person comes to the park. For example, if he last came 3 days ago, we may say he typically comes twice per week. This is more reliable than asking the frequency directly, since it relies on a fact which the person is sure of, not on his judgement of a rather intangible frequency.

We construct the table as follows. In the first column, we write the number of blocks. In the second column we write a measure of the area of ring shaped zone which lies at that distance. The area of this ring shaped zone, is proportional to the difference of two squares, i.e., the measure of area of the ring at 3 blocks, is $3^2 - 2^2 = 5$.

In the third column, we write the number of people who have come from that distance, each person multiplied by the number of trips per week he makes to the park. This gives us a measure of the total number of trips per week, which originate in that ring.

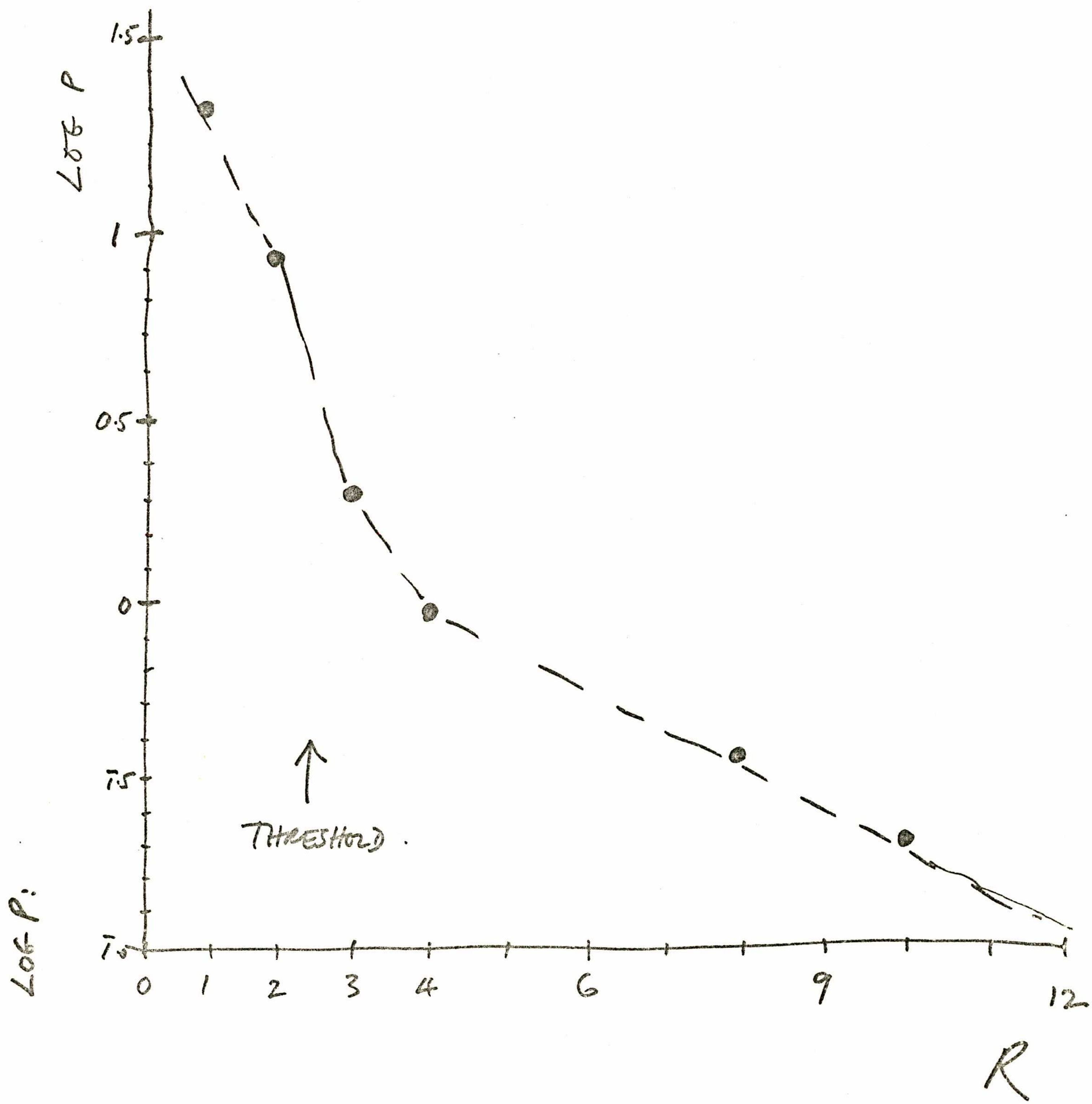
In the fourth column we write the number of trips per week, divided by the area of the ring. If we assume that people are distributed throughout the entire area at approximately even density, this gives us a measure of the probability that any one person, in a given ring, will make a trip to the park in a given week.

In the fifth column we write the logarithm (base 10) of the probability measure P. Under normal circumstances, the frequency of access to a given center will vary according to some law of the form $P = Ae^{-Br}$, where A and B are constants, and r is the radius. This means that if behavior and motivation are constant with respect to distance, and we plot the log of the frequency against the radius, we should get a straight line. Any aberration from the straight line, will show us the threshold where one kind of behavior and motivation changes to another.

TABLE

Radius R Blocks	Measure of area of the ring at Radius R	Trips/ week	P. Relative probability of trips, for any one person	Log P.
1	1	19.5	19.5	1.29
2	3	26	8.7	.94
3	5	11	2.2	.34
4	7	6	0.9	T.95
5	9	0	-	-
6	11	0	-	-
7	13	0	-	-
8	15	6	0.4	T.60
9	17	0	-	-
10	19	3	0.2	T.30
11	21	0	-	-
12	23	2.5	0.1	T.0

If we plot a graph of column R against Log P., we see that the resulting curve is S-shaped. It starts going down at a certain angle, then gets much steeper, and then flattens out again. The point where the curve plunges down at its steepest, shows us the threshold is between 2 and 3 blocks. This is the threshold. What



it means, essentially, is that for distances less than 2.5 blocks, people are more or less able to satisfy their need for access to a green, but that at greater distances the distance seriously inferes with their ability to meet this need.

But the inference is rather unexpected. It is clear, after all, that when people are close to a park, they go there relatively often, in fact, with a certain known frequency. We may assume, then, that people feel like taking this kind of break, with just that sort of frequency. When people live more than 2.5 blocks, or 750 feet, from the park, we may assume that they still have the desire, and the need, for this kind of relaxation - just as often as the people who live close to the park - but the distance prevents them from meeting their need. We may say then, that in an ideal world, everyone would be near enough to a green, so that they can go there whenever they feel the need for it. Our data allow us to say that people will be able to do this, whenever they live or work within 750 feet of such a park - but that when the nearest park is more than 750 feet away, they will be prevented from it. In short, an environment in which every house and workplace is within 750 feet of such a park, is adequate for peoples needs in this respect - an environment in which some houses and workplaces are more than 750 feet from such a park, is certainly frustrating peoples needs to some extent.

One question remains. How large must a "green" be, in order to satisfy this need. In functional terms this is easy to answer. It must be large enough, so that at least in the middle of it, you feel that you are in touch with nature, and away from the hustle and bustle. Our current estimates suggest that a green must be at least 60,000 square feet in area, and must be at least 150 feet wide, in the narrowest direction, in order to meet this requirement (see Walled Gardens for more details). Therefore:

Provide a green outdoor park, at least 60,000 square feet in area, at least 150 feet across in the narrowest direction, within 750 feet of every dwelling, and every workplace, in a city.

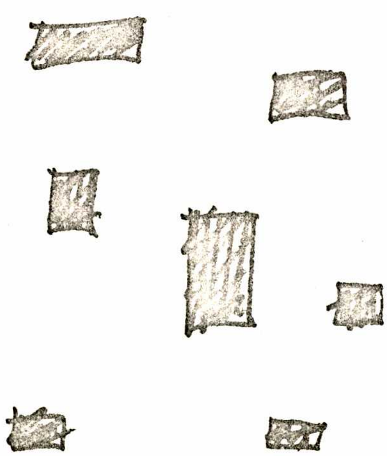
DRAFT

CONVEX CONNECTED OUTDOOR SPACE

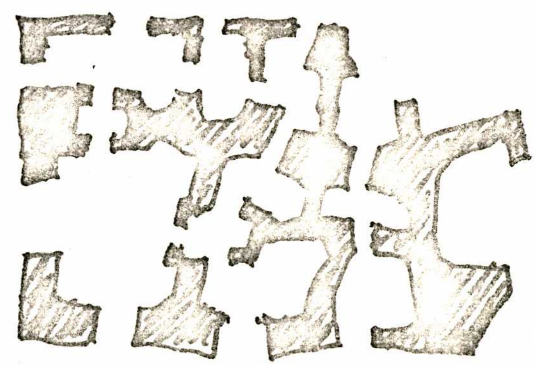
Outdoor spaces which are merely "left over" between buildings will, in general, not be used.

There are two fundamentally different kinds of outdoor space: negative space and positive space. Outdoor space is negative when it is shapeless, the residue left behind when buildings - which are generally viewed as positive - are placed in the land. An outdoor space is positive when it has a distinct and definite shape, as definite as the shape of a room, and when its shape is as important as the shapes of the buildings which surround it. These two kinds of space create entirely different plan geometries, which may be most easily distinguished by their figure ground reversal.

NEGATIVE SPACES
NO FIGURE GROUND REVERSAL



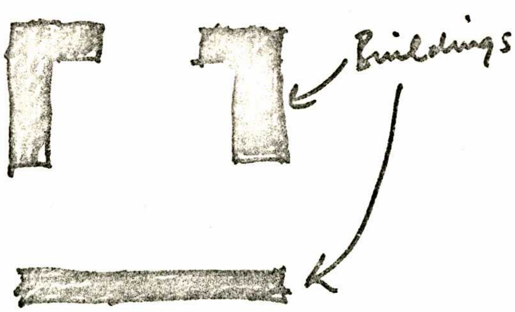
POSITIVE SPACES
FIGURE GROUND REVERSAL



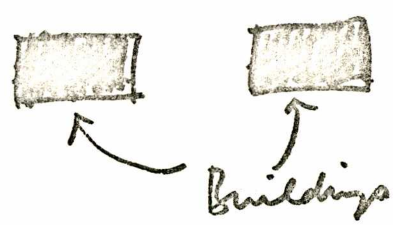
If you look at the plan of an environment where outdoor spaces are negative, you see the buildings as figure, and the outdoor space as ground. There is no reversal. It is impossible to see the outdoor space as figure, and the buildings as ground. If you look at the plan of an environment where outdoor spaces are positive, you may see the buildings as figure, and outdoor spaces as ground - <u>and</u>, you may <u>also</u> see the outdoor spaces as figure, against the ground of the buildings. The plans have figure ground reversal.

Another way of defining the difference between "positive" and "negative" outdoor spaces, is by their degree of enclosure, and their degree of convexity. Positive spaces are at least partly enclosed, and the shapes of the spaces which are felt are convex. Negative spaces are so poorly defined that you cannot really tell where their boundaries are, and to the extent that you can tell, the shapes are non-convex. For example:

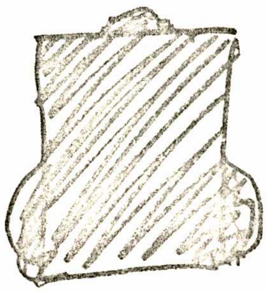
Example of
<u>positive space</u>



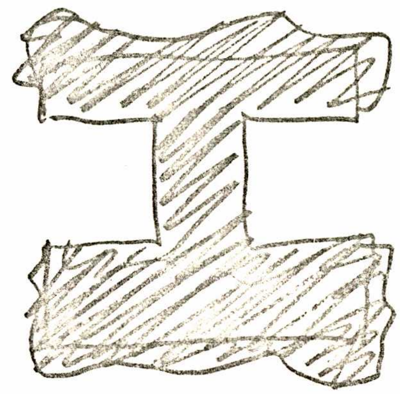
Example of
<u>negative space</u>



Shape of the space
formed by these buildings



Shape of the space
formed by these buildings



Now, what is the functional relevance of the distinction between "positive" and "negative" outdoor spaces. We put forward the following hypothesis. People feel comfortable in spaces which are "positive", and use these spaces; people feel relatively uncomfortable in spaces which are "negative", and such spaces tend to remain unused.

The general case for this hypothesis has been most fully argued by Camillo Sitte, in The Art of Building Towns. Sitte has analyzed a very large number of European city squares, distinguishing those which seem used and lively, from those which don't, and trying to account for the success of the successful ones. He shows, with example after example, that the successful places - i.e., those which are greatly used and enjoyed - have two properties. On the one hand, they are partly enclosed; on the other hand, they are also open to one another, so that each one leads into the next. The enclosure which he described, is the same exactly. The degree of enclosure of a space plays a vital role in deciding whether it is positive, or negative.

The fact that people feel more comfortable in a space which is at least partly enclosed, is hard to explain. To begin with, it is obviously not _always_ true. For example, people feel very comfortable indeed on an open beach, or on a rolling plain, where there may be no enclosure at all. But in the smaller outdoor spaces - gardens, parks, walks, plazas - enclosure does, for some reason, create a feeling of security.

It seems likely that the need for enclosure goes back to our most primitive instincts. For example, when a person looks for a place to sit down outdoors, a place to eat, he rarely chooses to sit exposed in the middle of an open space - he usually looks for a tree to put his back against, a hollow in the ground, a natural cleft which will partly enclose and shelter him. Our studies of people's space needs in workplaces show a similar phenomenon. To be comfortable, a person wants his workplace almost 50% enclosed, but not much more (Alexander, Jacobsen and Schreiner, _Workplace Enclosure_, Center for Environmental Structure, 1970). Clare Cooper has found the same thing in her studies of parks - people seek areas which are partially enclosed, and partly open - not too open, not too enclosed. (Clare Cooper, _Open Space Study_, 1969.)

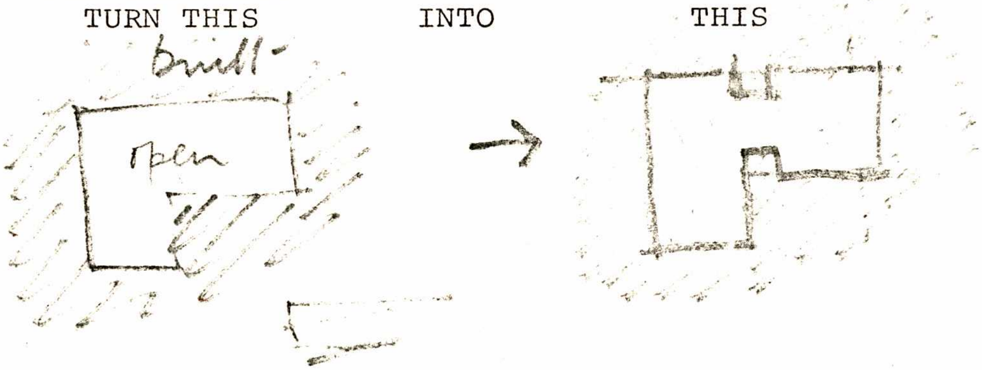
We have, at present, no substantial data which either supports or refutes our hypothesis. However, our accumulated experience suggests that this hypothesis is correct, and that experiments will bear it out. Recognizing that it is a hypothesis which is so far unproven, we propose the following rule of thumb:

Make every outdoor space convex in plan, and always place buildings, arcades, trees and walls, so that the outdoor spaces they form are convex in plan. Never enclose an outdoor space on all sides - instead connect outdoor spaces to one another so that it is possible to see and walk from one to the next in more than one way.

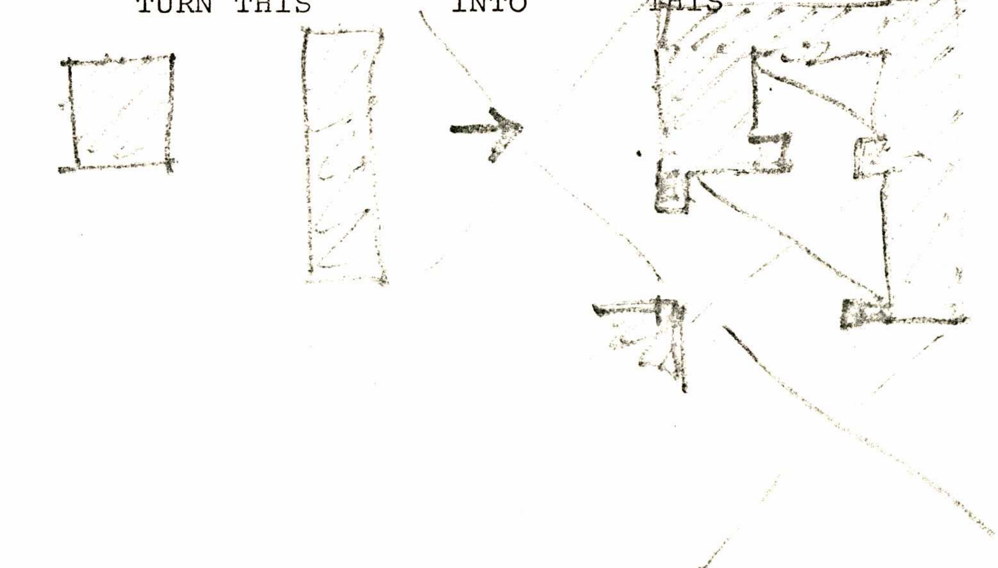
Wherever you see a part of an open space which is non-convex in plan - i.e. L shaped - place small buildings, or building projections, or walls, in such a way as to break the space into convex pieces.

For instance:

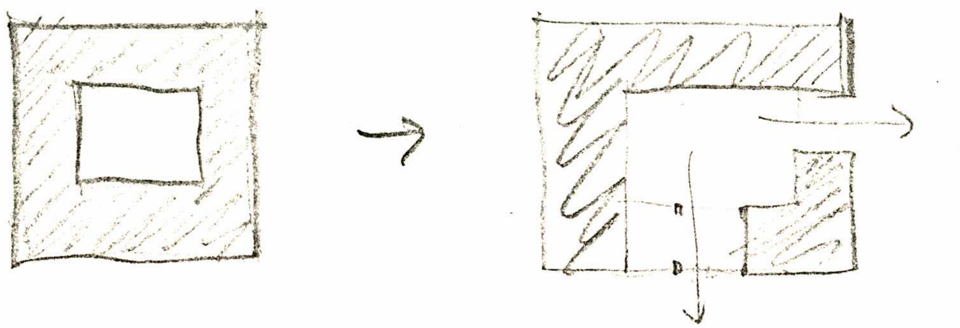
TURN THIS INTO THIS



or: TURN THIS INTO THIS



If an open space is ever too enclosed, break a hole through the building, and open it up.



Smith Living Open Space

Small Open Spaces

South Facing Open Space

People use open space if it is sunny, and don't use it if it isn't, in all but desert climates.

This bald statement is amazingly simple, but nevertheless true. Thousands of acres of open space in every city are wasted because they are north of buildings, and never get the sun. This is true for public buildings, and it is true for private houses. The recently built Bank of America building in San Francisco—a giant building built by a major architect—has its plaza on the north side. At lunchtime, the plaza is empty, and people eat their sandwiches in the street, on the south side where the sun is. Just so for small private houses. The lot shapes and orientation common in most developments force houses to be surrounded by open space which no one will ever use because it isn't in the sun.

A survey of a residential block in Berkeley, California, confirms this problem dramatically. Along Webster Street—an east-west street—18 of 20 persons interviewed said they used only the sunny part of their yards. Half of these were people living on the north side of the street—*these people did not use their backyards at all,* but would sit in the front yard, beside the sidewalk, to be in the south sun. The north facing back yards were used primarily for storing junk. Not one of the persons interviewed indicated preference for a shady yard; 2 of 20 gave no preference whatsoever.

The survey also gave credence to the idea that sunny areas won't be used if there is a deep band of shade, up against the house, through which you must pass to get to the sun. Four lots to the north had backyards large enough to be out of the shade of the house, and sunny, toward the rear. In only one of these yards was the sunny area reported as being used—and in it, it was possible to get to the sun without passing through a deep band of shade.

Although the idea of south facing open space is simple, there will have to be major changes in land use, to make it come right.

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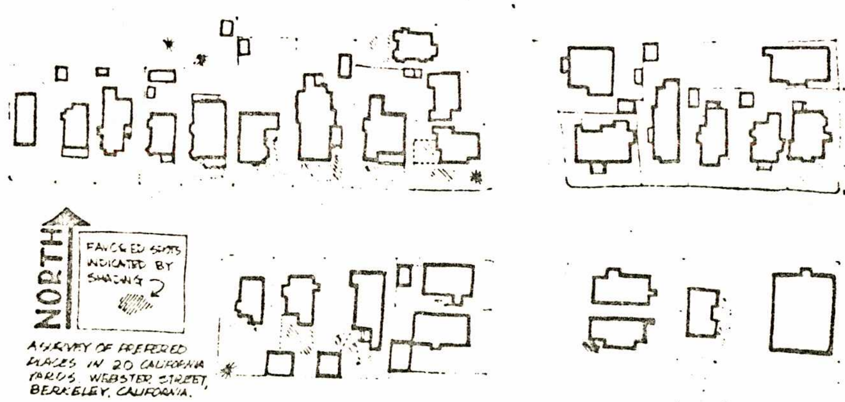
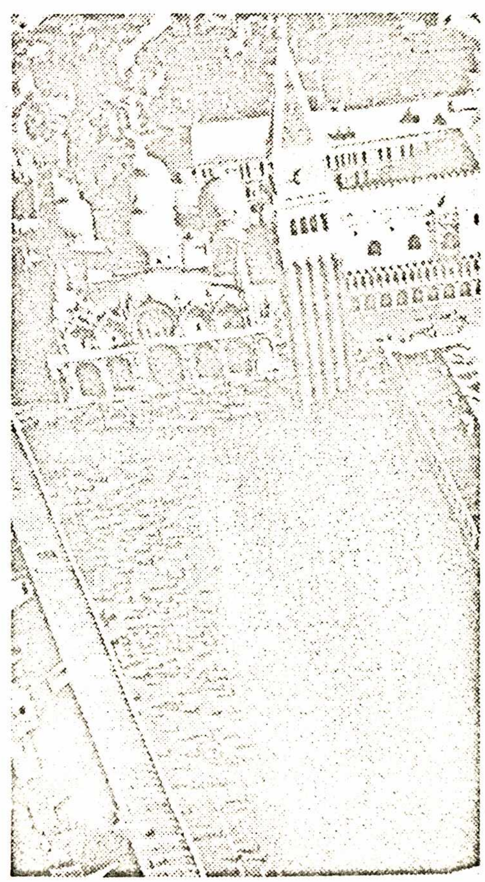


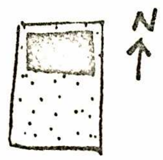


Therefore: Place all open space on the south side of the buildings which give onto it — avoid putting open space in the shadow of buildings, and never let a deep strip of shade separate the sunny area from the building it serves. Reorganize the shape and orientation of lots, to make this possible for private houses and small buildings.

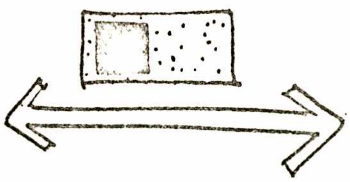
South Facing Open Space

Problem (continued)
This pattern has wide-spread implications for our cities. For example, our residential neighborhoods would have to be organized quite differently from today. Let us take this case for more detailed discussion:

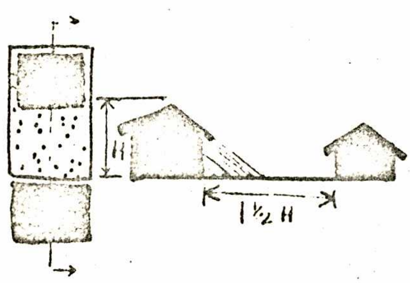
· In general, private lots would have to be longer north to south, with the houses on the north side.



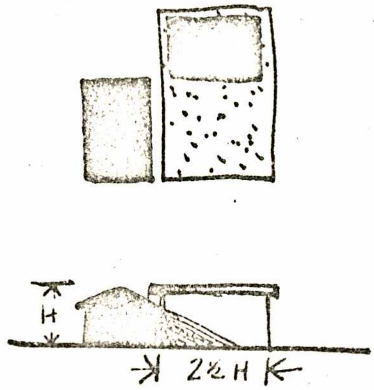
· If there is a city street immediately to the south of the lot, however, it will be better to make the lot longer east to west with the yard to one side so that access to the house does not destroy the privateness of the yard.



· If there is another building to the south, make the yard at least 1½ times the height of that building to allow sun in at least some part of the yard and into the house even in winter—about 15′ if it is a one storey building and 30′ if it is two. (These figures are appropriate for San Francisco. They will vary, of course, for different latitudes.)



· If there is a building to the east or west, make the yard at least 2½ times the height of the building so it will be in the sun as much as possible when the sun is usefully warm, above about 20 degrees elevation—about 25′ if it is a one storey building, and 50′ if it is two.



By: Christopher Alexander and Max Jacobson

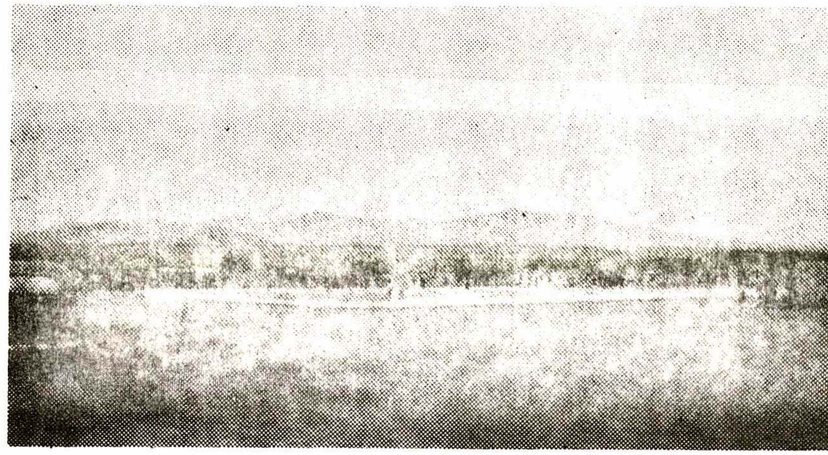
Contribution By: Jim Jones

December 1970

This pattern is tentative. If you have any evidence to support or refute its current formulation, please send it to the Center for Environmental Structure, P.O. Box 5156, Berkeley, California 94705; we will add your comments to the next edition.

Small Open Spaces

Plazas that are too large look and feel deserted — nobody goes there.



Time and again in modern cities, architects and planners build plazas that are too large. They look good on drawings; but in real life they end up desolate and dead.

Our observations suggest strongly, that public open spaces, intended as plazas, should be very small. As a general rule, we have found that they work when they have a diameter of about 60 feet — at this diameter people often go to them, they become favorite places, and people feel comfortable there; when the diameter gets above 60-70 feet, they begin to seem deserted and unpleasant. The only exceptions are places like the Piazza San Marco, or Trafalgar Square, which are teeming with people.

There are several possible functional bases for these observations. First, we know from the pattern, *Pedestrian Density in Public Places,* that a place begins to seem deserted when it has more than about 300 square feet per person.

On this basis a square with a diameter of 60 feet will begin to seem deserted if there are less than 12 people in it. There are very few places in a city where you can be sure there will always be 12 people. On the other hand, it only takes 4 people to give life to a square with a diameter of 35 feet. There are much better chances of 4 people being in a place than 12 — so the smaller square will feel comfortable for a far greater percentage of the time.

The second possible basis for our observations depends on the diameter. A person's face is just recognizable at about 70 feet; and under typical urban noise conditions, a loud voice can just barely be heard across 70 feet.

This may mean that people feel half-consciously tied together in plazas that have diameters of 70 feet or less — where they can make out the faces and half-hear the talk of the people around them; and that this feeling of being at one with a loosely knit square is lost in the larger spaces. Roughly similar things have been said by Philip Thiel (*An Architectural and Urban Space Sequence Notation,* unpublished ms, University of California, Department of Architecture, August, 1960, p. 5), and by Hans Blumenfield ("Scale in Civic Design", *Town Planning Review,* April, 1953, pp. 35-46); but we have found few formal observations which support them.

However, although the functional basis of this pattern is still unclear, the basic intuition is overwhelmingly strong:

(continued over)

Therefore: Almost every instinct to make large plazas is wrong. In 99 cases out of 100, make plazas and squares very small, with diameters never much greater than 60-70 feet.

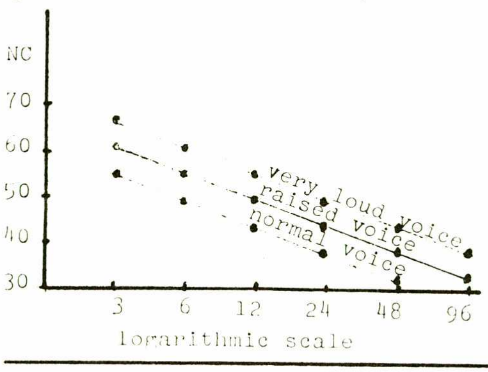
Small Open Spaces

Problem (continued)
We now present the experimental meterial for establishing maximum distances at which people can see expressions on one another's faces, and can talk to one another.

Our own informal experiments show the following results. Two people with normal vision can communicate comfortably up to 75 feet. They can talk, with raised voice; and they can see the general outlines of the expression on one anothers faces. This 75 foot maximum is extremely reliable. Repeated experiments gave the same distance again and again, ±10%.

At 100 feet it is uncomfortable to talk; and facial expression is no longer clear. Anything above 100 feet is hopeless.

These experiments were conducted in the open on a fairly quiet residential street: social and acoustic effects in an interior space, would decrease the distances. The few published results we have been able to find support these estimates.
Hailing Distance. The following table, adapted from Peterson and Gross, (*A. P. G. Peterson, and E. E. Gross, Handbook for Noise Measurement, Fifth Edition, General Radio Company, New Concord, Mass., 1963*), shows the relation between audible speech and background noise level (expressed on the background noise criterion scale).



Most public spaces of the kind under discussion will have a noise level of about NC30-40. At NC40, a very loud voice can be heard at 72 feet. At NC30, a raised voice can be heard at 96 feet, and a very loud voice at 180 feet.

It is therefore clear that the maximum permissible hailing distance is somewhere between 70 and 180 feet, according to the background noise level. E.T. Hall, without taking variation in sound level into consideration, gives the maximum hailing distance, outdoors, as 100 feet. (*The Silent Language, New York: Premier, 1961, p. 164.*)

Seeing Distance. Hans Blumenfeld (*op.cit.*) quotes the following figures:

1. A person's face can be recognised at up to 70 or 80 feet.

2. A person's face can be recognised as "a portrait", i.e. in richer detail, at up to about 48 feet.

Context.
This pattern applies to all plazas and squares which do not have an *extremely large captive group of users* — as do public market plazas, tourist gathering places, etc. It is especially critical for a square which is associated with a small group which seeks to maintain its integrity as a group, or whose social fabric depends on a certain amount of interactions between members of the group. (This would include the arena in a multi-service center, a neighborhood plaza, the courtyard in a university department or high school, etc.)

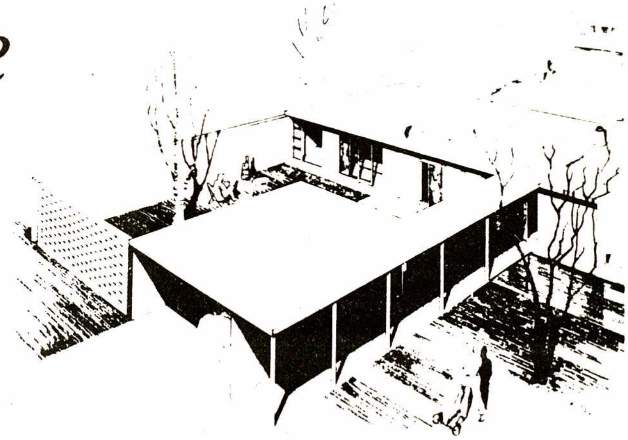
By: Christopher Alexander, Sara Ishikawa, Murray Silverstein.

July 1968 revised September 1970

Poetics Which Live

Patios Which Live

The patios built in modern houses are most often dead. They are intended to be private open spaces for people to use—but more often end up unused, full of gravel and abstract sculptures.



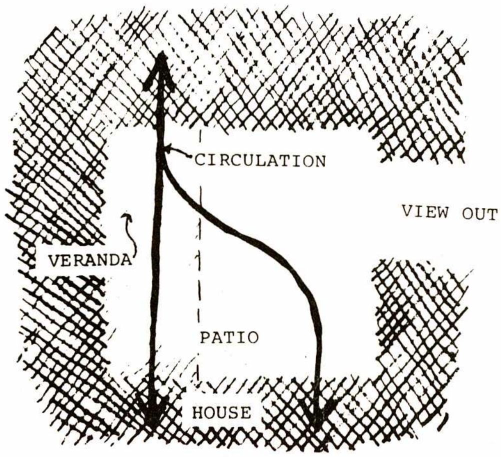
Informal observation suggests that these "dead" patios are unused for the following reasons:

1. No one ever goes to them when they do not have any natural relation to the activities in the house—this is especially true for those that are dead-ends, off to one side of rooms. To overcome this, the patio should have activities, opening off at least two opposite sides, so that it becomes the meeting point to these activities, provides access to them, provides overflow from them, and provides the cross-circulation between them.

2. They are so enclosed that they become claustrophobic. Patios which are pleasant to be in always seem to have "loopholes" which allow you to see beyond them into some further space. The patio should never be perfectly enclosed by the rooms which surround it, but should give at least a glimpse of some other space beyond.

3. They are oppressive. No one wants to sit surrounded by blank walls, disconnected from the house, with a little square of sky overhead. To solve this problem, the patio needs to be partly roofed. This provides a sitting space that is less nakedly exposed to the sky, and, if the roofed part is continuous with some interior part of the house, makes the patio seem more like a part of the house, and makes it more likely that people will drift naturally into the patio.

Therefore, to make a patio work:



1. Place it so that there are sources of traffic and activity on at least two sides, preferably three, and it functions in part as a circulation space.

2. Don't enclose it completely, but make sure that you can see out, in at least one direction, to some larger space beyond.

3. Roof at least one side of it, and make this roofed part at least two meters deep, and continuous with the inside of the building.

Patios Which Live

By: Christopher Alexander, Sanford Hirshen, Sara Ishikawa, Christie Coffin, Shlomo Angel.

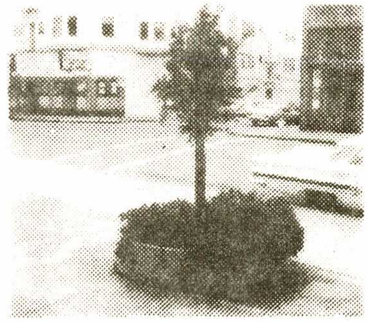
August 1969 revised May 1970

This pattern is tentative. If you have any evidence to support or refute its current formulation, please send it to the Center for Environmental Structure, P.O. Box 5156, Berkeley, California 94705; we will add your comments to the next edition.

Tree Places

Trees Must Stay
(same as above)?

Tree Places



When trees are set down without regard for the special places they can create, they are as good as dead for the people who need them.

Trees have a very deep and crucial meaning to human beings. The significance of old trees is archetypal; in our dreams very often they stand for the wholeness of personality: "Since . . . psychic growth cannot be brought about by a conscious effort of will power, but happens involuntarily and naturally, it is in dreams frequently symbolized by the tree, whose slow, powerful involuntary growth fulfills a definite pattern." *(M. L. von Franz, "The process of individuation", in C. G. Jung, Man and his Symbols, Doubleday and Co., N.Y., 1964, pp. 161, 163-4.)*

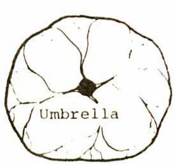
There is even indication that trees, along with houses and other people, constitute one of the three most basic parts of the human environment. The House-Tree-Person Technique, developed by Psychologist John Buck, takes the drawings a person makes of each of these three "wholes" as a basis for projective tests. The mere fact that trees are taken as bristling with meaning, equal to houses and other people, is, alone, a very powerful indication of their importance *(V. J. Bieliauskas, The H-T-P Research Review, 1965 Edition, Western Psychological Services, Los Angeles, California, 1965;* and *Isaac Jolles, Catalog for the Qualitative Interpretation of the House-Tree-Person, Western Psychological Services, Los Angeles, California, 1964, pp. 75-97.).*

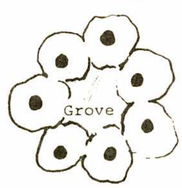
Intuitively, everyone recognizes the wonderful feeling that trees give to an environment. They are prized in nearly every part of the city. People grow attached to special trees in their neighborhood; they pay more for homes in neighborhoods with many trees. Even the developers now try to give one tree for each house, in their developments.

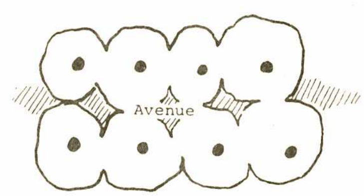
But for the most part, the trees that are being planted and transplanted in cities and suburbs today do not satisfy people's craving for trees. They will never come to provide a sense of beauty and peace, because they are being set down and built around *without regard for the places they create.*

The trees that people love create special social places; places to be in, and pass through, places you can dream about, and places you can draw. Trees have the potential to create basically three kinds of social places: An *umbrella*—where a single, low-sprawling tree, like an oak, defines an outdoor room; a *grove*—where several trees cluster together, roughly in a circle; and an *avenue*—where a double row of trees, their crowns touching, line a path or street. It is only when a tree's potential to form places is realized that the real presence and meaning of the tree is felt.

The trees that are being set down nowadays have nothing of this character—they're in tubs on parking lots and along streets, in specially "landscaped areas" that you can see but cannot get to. They don't form places in any sense of the word—and so they mean nothing to people. (continued over)







Therefore: Plant saplings and build around existing trees, paying deep attention to the kinds of social places it's in their nature to create. Make each tree a part of such a place: an umbrella, a grove, an avenue, or some variation. Let the built environment set off these places, never destroy them.

A Tree They Couldn't Cut

By Manaff Abdullah
Chronicle Foreign Service

Kuala Lumpur

A school playground will be much smaller than planned because of an ancient tree which spooked all attempts to fell it.

Three years ago officials at the Cochrane road secondary school authorized clearing of a thicket to make way for a playing field. The thicket was soon cleared — except for one tree.

Workers who attempted to chop the tree down were stopped in their tracks before they could swing their axe.

A bulldozer was tried. Its engine died each time it approached the tree or the driver became dizzy and was unable to operate the machine.

School officials finally gave up and decided to spare the tree.

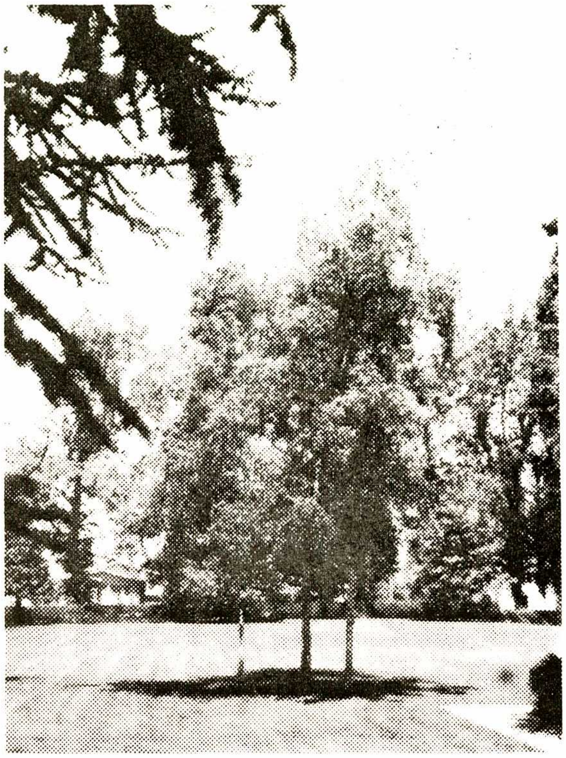
The tree, it is said, is the home of a deity. Allamah Pallikutaru, 55, said she had been told in a vision that Hindu goddess Esewary lived in the tree.

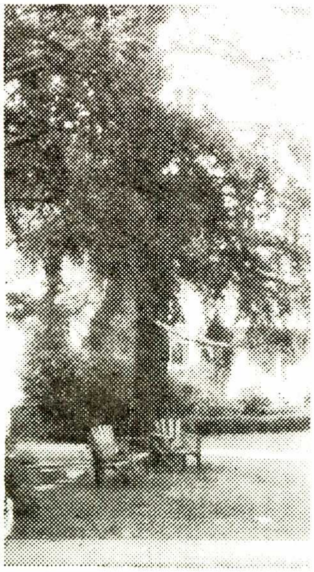
"I was told to take care of the tree and warn those who wished to uproot it that sad things would happen to them," she said. Even if there's an earthquake, the tree won't be uprooted.

"I have been a regular worshipper here and my only purpose in living is to take care of the tree."

She has spent a large part of the money she earns as a domestic servant buying milk, fruit and oil to offer at the tree.

Residents of the area erected a shelter around the tree after attempts to fell it had failed.





By: Denny Abrams and Murray Silverstein.

December 1970

This pattern is tentative. If you have any evidence to support or refute its current formulation, please send it to the Center for Environmental Structure, P.O. Box 5156, Berkeley, California 94705; we will add your comments to the next edition.

DRAFT

PLACES AT THE EDGES OF BUILDINGS

<u>People prefer being at the edges of open spaces, but the outer edges of buildings surrounding open spaces are not suited for people to be near</u>.

People feel more comfortable walking and being close to the edges of space rather than in the middle of them. We also know that people will choose to sit clost to building edges, with their backs to them, looking out on more open areas or onto activities. In observing people's behavior in outdoor spaces, for example, Jan Gehl discovered that "there is a marked tendency for both standing and sitting persons to place themselves near something - a facade, pillar, furniture, etc." ("Mennesker til Fods (Pedestrians)", Arkitekten, No. 20, 1968.) This tendency of people to stay at the edges of spaces, is also discussed in the patterns, Activity Pockets, and Building Stepped Back.

The outside walls of buildings form outdoor spaces, yet we give little attention to their design. While much attention is given to the interior walls in buildings, little thought is usually given to the treatment of exterior walls and the spaces just adjacent to them. Most building walls, in fact repel people instead of inviting them to come close to them.

If outdoor spaces were taken as seriously as indoor spaces, ~~and we feel that they should be~~, then the exterior walls of buildings would look very different indeed. They would be more like places - walls would weave in and out, and the roof would extend over them to create little places for benches, posters and notices for people to look at. For such places to have the right depth, they would have to be at least 6 feet deep (for the same arguments as presented in Two Meter Balcony) and the roof must be low, on the order of 7 or 8 feet.

Therefore: <u>Crenallate the outer perimeter of buildings with places for activity by giving them depth and a covering, and making places to sit and lean, and walk, especially at those points on the perimeter which look onto interesting outdoor life.</u>

DRAFT

TERRITORIAL AMBIGUITY

~~CONNECTION TO THE PUBLIC WORLD~~

Arcades - covered walkways at the edge of buildings, which are partly inside the building, partly outside - play a vital role in the way that group territory and the society-at-large interact.

There are many many public places in cities which are only theoretically public. That is, they do not have the character of truly inviting the public in; they operate essentially as private territory for the people who are inside.

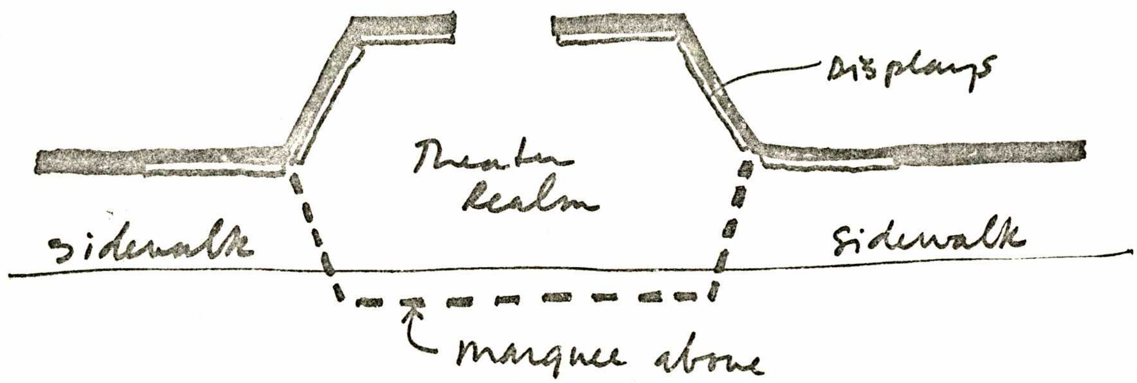
A university building, for example, is, in effect, a public building to the people of the university. ~~town.~~ But, as a rule, university buildings are only theoretically public. The people-at-large, including university people with no formal business in the building, never feel that these places are public, and that they have a perfect right to drop in, and find out what is going on inside. People are inhibited from such activity, because the building appears as the territory of a special group, say the Biology Department; and people do not feel free to "invade" such territory, without formal reason. Accordingly, the university becomes a collection of theoretically public buildings, which in fact operate as islands of territory, and the public learns to restrict its business to only those places where they have "legitimate business".

The city contains many so-called public places, which operate in just this manner: libraries, service buildings, shops, schools, churches, bars, etc.

The fact that public places operate in this way is natural enough: The people who use the facility regularly, and who do have formal business there, treat the building as their territory. They could hardly do otherwise; psychologically, it is their territory.

The problem lies in the fact that there are no strong connections between the territorial world, within the building, and the purely public world outside. There are no realms between the two kinds of spaces, which are ambiguously a part of each - places that are felt as characteristic of the territory inside, and simultanesouly, part of the public world.

The classic instance of this kind of space in our culture, is the entrance to the traditional movie theater. These places have a wonderful character: There is always a marquee, stretching out, over the sidewalk, defining the space beneath as theater territory. There is the deep cavity, opening directly off the sidewalk, and paved at grade with the sidewalk, marking the space as an extension of the public world. And there are the displays on the sidewalk, that turn the corner, and lead up to the threshold, establishing the character of the movie.



The effect is a realm which thoroughly connects the territory of the theater, with the public world. Walking through this realm, we cannot help but feel the presence of the theater; everyone is free to stop there, to look over the posters, and talk to the doorman. The place is thoroughly public, and it is felt as theater territory.

The fact that there are so few places like this in cities must be seen as both cause and effect. There are not many places which truly invite us in, from the public (aside from the department stores and the garish restaurants), and so we do not much explore the city. And because we do not explore, and expect exploration, we build our public buildings as islands of "official" territory.

The result is an impasse in our public life. The only way to break the impasse, is to take the conception of public building seriously, to open these places up, and, like the movie theater, connect them to the public world with strongly identified realms.

These realms will only work when they have the following properties.

1. To make them public, the public path to the building must itself become a place that is partly inside the building; and this place must contain the character of the inside - with displays, etc.

2. To establish this place as a territory which is also apart from the public world, it must be felt as an extension of the building interior, and therefore covered.

Give every public building a realm, which lies half-way between it and the public world; make this realm a covered extension of the public path; and set it half into the building, with displays, views and openings along the path. The arcade is the simpler and most beautiful way of making such a realm. The arcades run along the building, where it meets the public world; they are open to the public, yet set partly into the building, and must be at least 7' deep.

There are other configurations which can work in the same way. In particular, two patterns from the Multi-Service Center report, are aimed at this problem. "Building Thoroughfare" describes public paths that run through buildings; and "Street Niches" gives the argument for cavities, continuous with the sidewalk, looking into the buildings. (A Pattern Language Which Generates Multi-Service Centers, Center for Environmental Structure, Berkeley, California, 1968, pp. 101-104 and 187-189.)

A good deal of Bernard Rudofsky's recent book, Streets for People, is concerned with the arcade, as the classic device for making the street a substantial public place:

"It simply never occurs to us to make streets into oases rather than deserts. In countries where their function has not yet deteriorated into highways and parking lots, a number of arrangements make streets fit for humans; pergole and awnings (that is, awnings spread across a street), tentlike structures, or permanent roofs. All are characteristic of the Orient, or countries with an oriental heritage, like Spain. The most refined street coverings, a tangible expression of civic solidarity - or, should one say, of philanthropy - are arcades. Unknown and unappreciated in our latitudes, the function of this singularly ingratiating feature goes far beyond providing shelter against the elements or protecting pedestrians from traffic hazards. Apart from lending unity to the streetscape, they often take the place of the ancient forums. Throughout Europe, North Africa, and Asia, arcades are a common sight because they also have been incorporated into "formal" architecture. Bologna's streets, to cite but one example, are accompanied by nearly twenty miles of portici." (B. Rudofsky, Streets for People, Doubleday and Co., New York, 1969, p. 13; pp. 59-104, pp. 201-232.)

UNIVERSITY AS A MARKETPLACE

(SEE CAMPUS)

PATHS INTERRUPT ROADS

(SEE LOCAL ROADS)

Centripetal Pedestrian Paths

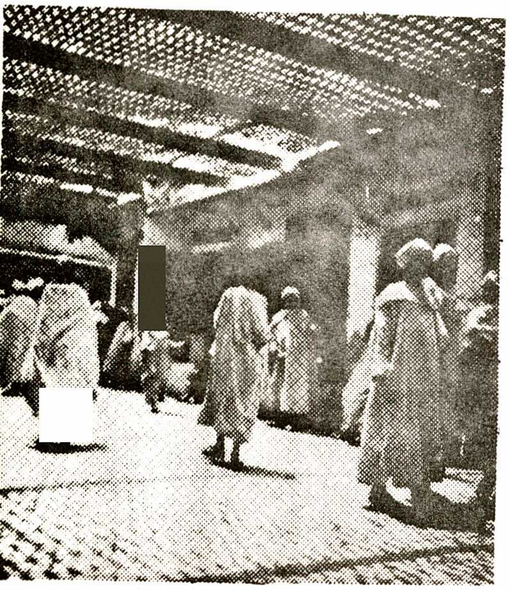
Centripetal Pedestrian Paths

Streets should be for staying in, and not just for moving through the way they are today.

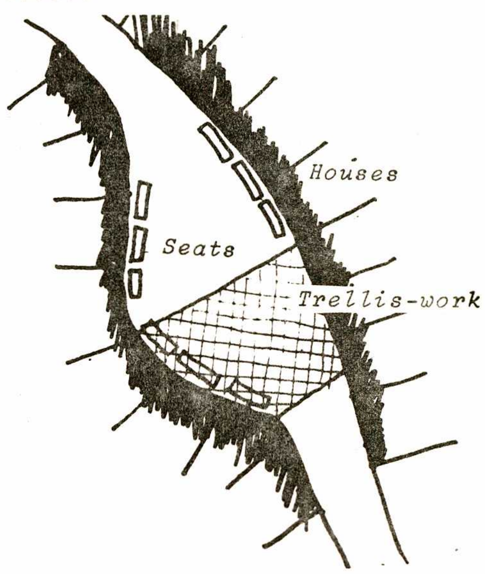
For centuries, the street provided city dwellers with usable public space, right outside their houses. Now, in a number of subtle ways, the modern city has made streets which are for "going through", not for "staying in". This is reinforced by new regulations which make it a crime to loiter, by the greater attractions inside the house itself, and by streets which are so unattractive to stay in, that they almost force people into their houses.

All this contributes to the fact that people in cities feel isolated, insecure, detached from society. Two recent studies have shown that mental illness, and acute feelings of isolation, are more common among people who cannot reach the street from their dwellings, than among those who can. *(D.M. Fanning, "Families in Flats", British Medical Journal, 18 November 1967; and Joan Ash, "Families Living at High Density", Official Architecture and Planning, London, January, 1966, pp. 68-81; also Sociological Research Section, Ministry of Housing and Local Government, n.d., 87 pp.)* The fact that the street drives people away from it must surely have the same effect.

From an environmental standpoint, the essence of the problem is this: Streets are "centrifugal" not "centripetal": they drive people out, instead of attracting them in. In order to combat this effect, the pedestrian world outside houses must be made into the kind of place where you "stay", rather than the kind of place you "move through". It must, in short, be made like a kind of outside public room, with a greater sense of enclosure than a street.



Therefore:
Make residential pedestrian streets subtly convex in plan with seats and galleries around the edges. When you can, roof the streets perhaps with beams or trellis-work.



Centripetal Pedestrian Paths

By: Christopher Alexander, Sanford Hirshen, Sara Ishikawa, Christie Coffin, Shlomo Angel.

August 1969 revised May 1970

This pattern is tentative. If you have any evidence to support or refute its current formulation, please send it to the Center for Environmental Structure, P.O. Box 5156, Berkeley, California 94705; we will add your comments to the next edition.

DRAFT

BIKE PATHS AND RACKS

Bikes are cheap, healthy, and good for the environment; but they are threatened by cars, on major roads; and they threaten pedestrians on pedestrian paths.

The use of bikes in cities, and especially in such places as college campuses, has always been widespread in European countries; in the United States, it is increasing year by year. However, in an environment not designed for bikes, their use creates various problems.

These problems are:

* Bikes are threatened where they meet, or cross, heavy automobile traffic.
* Bikes endanger pedestrians, when they are ridden along pedestrian paths.
* People always ride their bikes as close to the destination as possible - this means the bikes get piled up around the main entrances of buildings, where they obstruct movement, and even discourage people from sitting, or talking.
* This is acute in wet weather, since people naturally try to store their bikes out of the rain - so entrances, arcades, and corridors get even more filled with bikes.
* People tend to ride bikes along the shortest routes, which are usually pedestrian paths, not roads, at least within a precinct like a campus - thus aggravating the danger and nuisance to pedestrians.

To solve these problems we propose a system of paths designated as "bike paths", with the following properties:

1. The bike paths are marked clearly with a special, easily recognizable surface (for example, a red asphalt surface). Bike paths always coincide either with local roads, or major pedestrian paths. Where the system coincides with a local road, its surface may simply be part of the road and level with it. Where the system coincides with a pedestrian path, the bike path is separate from that path and a few inches below it.

2. The system of bike paths comes within 100 feet of every building.

3. The system forms a series of continuous loops, instead of being a branching tree-like structure.

4. Each building has a bike rack associated with it. This bike rack is on that side of the building which is towards the center of campus; it lies on a bike path which comes within 100 feet of the building; and it is directly opposite a main entrance of the building.

5. There is a covered path, which has at least two or three steps in it, leading from the bike rack to the main entrance of the building.

Explanations of these five points are:

1. It is essential for bike paths to run in streets or along pedestrian paths - because if it were different, there would almost always be a shortcut on one or the other of these systems which bike riders would take instead. The bike path, when associated with a pedestrian path, must run below it, to discourage bike-riders from riding on the pedestrian path itself.

2. This figure is a guess. If the figure is set lower (i.e. 50 feet, say), the bike path system will become very complex. If the figure is set higher (i.e. 200 feet say), there is a good chance that people won't store their bikes in the bike racks, but will ride them up to the building entrance, and obstruct it.

3. The system of bike paths, has to be continuous - i.e., made of loops, not a tree-like structure with cul-de-sacs - so that you can always go more or less towards the next building you are going to, and never have to go a long way round. In other words, the bike paths system approximates the shortest route between any two bike sheds - or any two buildings.

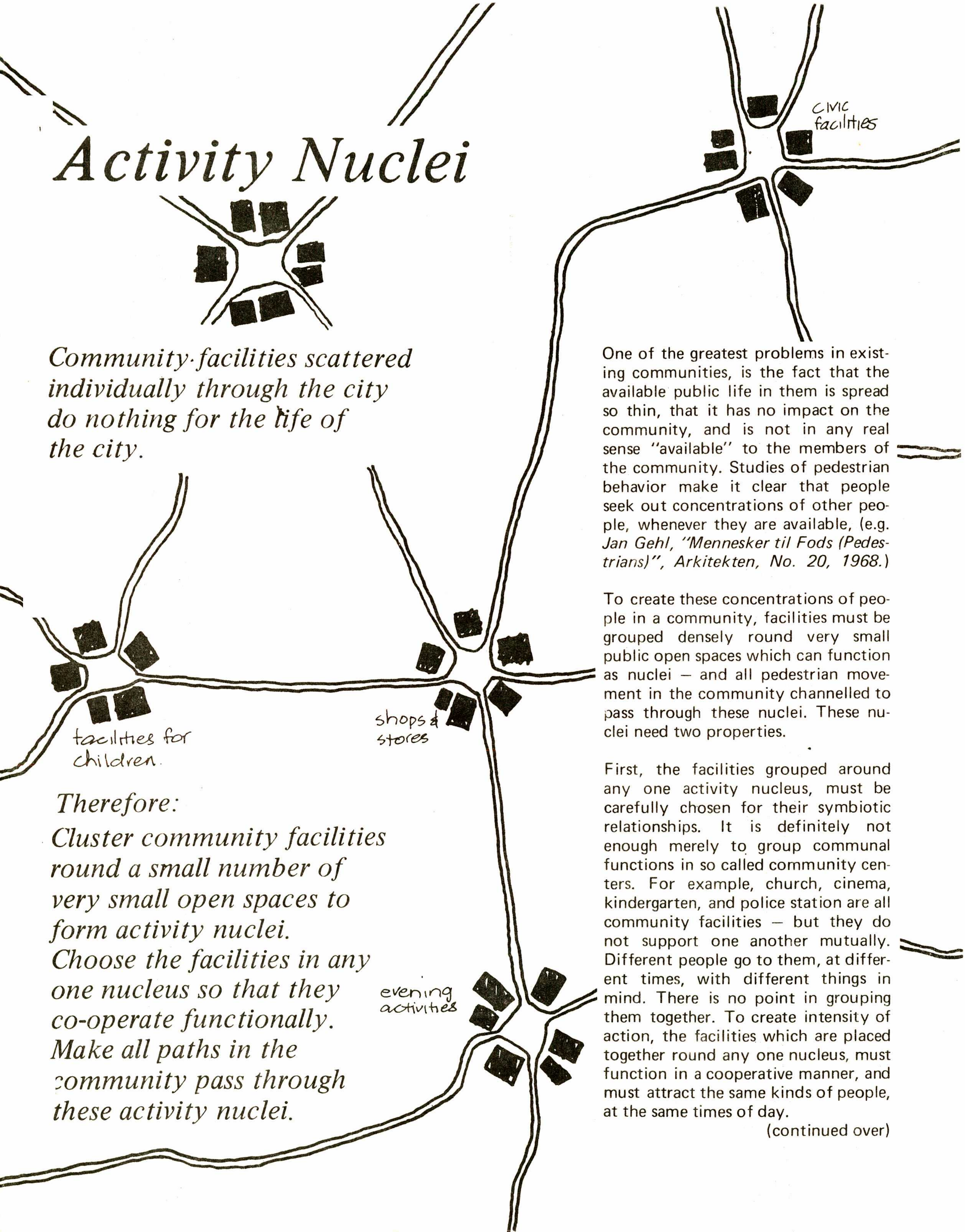
4. If the bike rack is on the side of the building "away" from the center of campus, there is almost certainly another building entrance closer to the campus center, and that is where the bike will all end up, so the bike rack just won't be used.

5. If the path from the bike rack to the building goes up steps, and is under cover, there will be very little temptation for people to take their bikes right up to the building entrance.

Activity Nuclei

Activity Nuclei

Community facilities scattered individually through the city do nothing for the life of the city.



One of the greatest problems in existing communities, is the fact that the available public life in them is spread so thin, that it has no impact on the community, and is not in any real sense "available" to the members of the community. Studies of pedestrian behavior make it clear that people seek out concentrations of other people, whenever they are available, (e.g. *Jan Gehl, "Mennesker til Fods (Pedestrians)", Arkitekten, No. 20, 1968.*)

To create these concentrations of people in a community, facilities must be grouped densely round very small public open spaces which can function as nuclei – and all pedestrian movement in the community channelled to pass through these nuclei. These nuclei need two properties.

First, the facilities grouped around any one activity nucleus, must be carefully chosen for their symbiotic relationships. It is definitely not enough merely to group communal functions in so called community centers. For example, church, cinema, kindergarten, and police station are all community facilities – but they do not support one another mutually. Different people go to them, at different times, with different things in mind. There is no point in grouping them together. To create intensity of action, the facilities which are placed together round any one nucleus, must function in a cooperative manner, and must attract the same kinds of people, at the same times of day.

Therefore:

Cluster community facilities round a small number of very small open spaces to form activity nuclei.
Choose the facilities in any one nucleus so that they co-operate functionally.
Make all paths in the community pass through these activity nuclei.

(continued over)

Problem (continued)
For example: When evening entertainments are grouped together, the people who are having a night out can use any one them, and the total concentration of action increases. When kindergartens and small parks and gardens are grouped together, mothers and young children may use either, so their total attraction is increased. When schools and swimming pools and football space are grouped together, they form natural centers for school children.

For reasons stated in *Small Open Spaces*, the open spaces which form the nuclei should be very small – 15 x 20 meters is the ideal size. If the space has to be larger, it should be long and narrow, with its short dimension no more than 20 meters.

Context
This pattern applies to any community large enough to support community facilities – whether it is a new one just being designed, or an old one being redeveloped or undergoing a zoning change.

By: Christopher Alexander, Sanford Hirshen, Sara Ishikawa, Christie Coffin, Shlomo Angel.

August 1969 revised June 1970

<u>DRAFT</u>

NO ISOLATED STUDENT UNION

<u>When a single building on campus is designated as student territory, it raises the feeling that the rest of campus is not student territory</u>.

Recent trends in the design of student unions has been to make larger and more luxurious show pieces. This is partly in response to larger student enrollments, but it comes about also because there is a tacit understanding to somehow try to do justice to the fact that the university is supposed to exist first and foremost for students, and since the union, is the symbol of student activity and territory, it would seem that in order to try to put the point across, the student union ought to be "bigger and better".

There are two things wrong with this notion:

1. The symbolism works against itself: The more the student union is made something of, the more it emphasizes the fact that it is the <u>only</u> piece of student territory on campus, and the more it seems that the rest of campus <u>is not</u> student territory. The student union becomes the only place the students feel comfortable in and the only place they feel as though they have a right to be in. This strict and limited distinction of territory has the effect of perpetuating the segregation and alienation of students from the rest of campus, ~~and makes it more difficult to achieve a real campus~~, and makes it more difficult to achieve real campus community which would bring students, faculty and staff together under the most normal social conditions.

2. Secondly, the original purpose of the union, which is to provide all the students a place to relax and feel at home in, is not met by simply enlarging one union, as the student population grows. The critical issue is whether or not the student union is accessible, not whether it is large enough. On almost any campus, the students who do not use the union, do not use it because it is not close enough to where they spend most of their time. Enlarging a single union building will make no difference to them.

Furthermore, the overdefined and limiting concept of a single student union and the distance one has to go to get to it, further compartmentalizes the lives of students on campus. The educational and growth process relies on an integration and mutual support of formal and informal activities, and on academic and social relationships. It is impossible for academic relationships and social relationships to merge when they are zoned off from each other. To quote Michael Cassidy ("Architecture and the Sociology of University Life", Universities Quarterly, Vol. 18, No. 4, September, 1964, page 358): "The new social academic relationship affects what used to be called the zoning plan. Instead of a zone for student activity (the student union building), a zone for academic departments and faculties, and a zone for halls of residence frequently at some distance from the campus, we must expect an intermingling of public, social and academic facilities." He goes on to point out the importance of the integration of social and academic activities: "Friendships may be generated within a seminar group, to be reinforced later by non-academic activity, which in turn affects the behavior of the group when next the seminar meets".

A decentralized student union will solve these problems. If the entire campus had a large number of small satellite unions, distributed according to population, so that there was one within a few minutes of any place on campus, the students will feel that the entire campus is their territory; the union will better serve the entire campus population; and the whole of campus life would be more integrated.

Given that a decentralized union then makes sense, what should the distribution of these satellites be, and how large should they be?

Most students use the student union for casual meeting of friends, for a coffee break, to read a newspaper and relax for a few minutes. We speculate that this kind of spontaneous activity requires that the union is not more than two minutes away. In addition it must be small enough so that you will very likely meet somebody there that you know.

We observed an interesting case of a new coffee-lunch counter lounge built about three months ago on the ground floor near the main entrance of Wurster Hall in Berkeley. Wurster is located about 1000 feet from the main student union complex for the campus. No one from Wurster used the student union for breaks; they simply did not have a place to go to for a quick but relaxed cup of coffee. The lounge was an immediate success, not only for the students and faculty and staff of Wurster but very soon, also for people in Kroeber Hall (100 feet away), the Music Department (150 feet away), and for a few students in the Law School (250 feet away) and Optometry (200 feet away).

Looking at the distances between these buildings and Wurster, and taking into account that all of them are at least three stories high,(a student climbs up stairs at an average rate of 30 feet per minute and walks horizontally at a rate of 275 feet per minute), it seems about right to say that satellite unions should be distributed so that they are within two minutes of classrooms, and offices. People from buildings a bit further do not come, we guess because it is too far away for them.

Our informal observations at Oregon tend also to substantiate this figure. It appears as though people there in the area around the music and education department (about 1800 feet away from the union), Lawrence (700 feet away) and Prince Lucien Campbell (1000 feet away), rarely use the student union for breaks. We recommend that an experiment very much like the one described in the pattern, Access to a Green, be performed, in order to determine where people in the union have just come from - this will give us a more precise idea of the maximum distance a union can be from people's workplaces and classrooms, if they are to use it.

The size of the satellite union is a bit more difficult to arrive at. It involves at least the following issues:

1. In order for the satellite union to function as an authentic communal place, it must serve a small enough group of people, so that you can recognize the people who use it, at least by face, and small enough so that you can expect to see certain people there during the course of the day.

It is interesting to note that when a student union is too large, students overcome its size by establishing certain parts of it as their territory. At the University of Oregon, for example, we noticed that the same people were often found in the same parts of the union. We believe that the motive for establishing parts of the union as territory for certain groups comes about as a defense against its size - the place becomes too impersonal because there are too many people in it. It is hard to say what this maximum number is, but it is probably under 1500; we guess it is more like 1000. If one tries to imagine a neighborhood or small community of 1000, it seems possible that one would eventually start recognizing everyone in it.

2. On the other hand, the satellite union must serve a large enough population, so that there are always people in it, and it is always lively. If we say that there must always be at least 50 people in it, and assume that on the average about 10% of the people the union is serving, would be using it at a given moment, this requirement then establishes as a lower limit, about 500 people which would be served by any one union. (Again, this 10% ratio needs to be checked.)

3. The union must be small enough so that it has some degree of intimacy - this means it is at a physical scale that you can relate to: it must not have too many rooms so that you can't be familiar with all of them. Probably it is best, if it has one room which one can scan, so that it is possible to get a sense of the whole place and everyone in it.

4. It must be large enough, so that it will be economically and managerially efficient. A minimum for a union is a lounge with a coffee and snack bar. There must always be enough people in this lounge to support at least one person or better still two people working there. Our observations of coffee shops indicate that if there are typically 50 people in a coffee shop two employees are justified.

From the above then, we can say that the right number of people to be served by any one union, seems to be in the neighborhood of 500 to 1000 people, and that the actual physical size should be based on about 10% of the people served, being in it at any given time. Lounge spaces are figured at 25 square feet per person. Thus, the size of a satellite union is 2.5N, where N is the number of the people served by the union.

Therefore: Create many small student unions across campus - one for every 500 to 1000 students, and so that there are no classrooms or offices which are farther than two minutes from one*. Each little union has at least a coffee bar and lounge/ reading room., and its size is roughly 2.5N, where N is the number of people served by it.

Note that this pattern is focussing on the need for many satellite unions across campus. It is not saying that there should not be a central student union in addition.

In fact there are many specialized functions offered by student unions of which there is only one, and which will then serve the entire campus best if they were located in a central union; examples are student government offices, administrative offices, ballroom, bowling, barbershop, bookstore, central information, post office, etc.

On the other hand, it would help if some of the satellite unions could provide some special activities which lend themselves to some degree of decentralization, such as pool, special food concessions, etc. Then each satellite union will develop a character of its own, and people can better relate to it.

* Use 275 feet per minute horizontal walking speed for students and 30 feet per minute for vertical distances to get actual distances.

DRAFT

REAL LEARNING IN CAFES

Coffee shops, bookstores, films, little restaurants are as vital to the process of education and personal growth as labs and exams. Without them, the university is not a complete educational milieu.

The relaxed, lively, and free atmosphere of shops and restaurants, is irreplaceable in any university environment. Going to the theater, or seeing a movie, browsing in a bookstore or record shop, discussing something over a beer or cup of coffee in a cafe, eating out at a restaurant, are all a part of learning and growing. These activities go hand in hand with the more formal education one gets in classrooms. While the work that goes on in class is intense, tightly scheduled, and often difficult to relate to one's own life, the relaxed and open atmosphere of shops and restaurants gives the students a chance to do things, make discoveries and cultivate interests, tastes and attitudes, at their own pace. They give students a chance to make their tastes and needs come together with spending time and money - a basic part of human culture.

The two kinds of environment - classes and shops, and the two kinds of activities - formal and informal acculturation are complementary - one is more meaningful because of the other.

We interviewed 30 students at the University of Oregon to see to what extent shops contributed to their intellectual, emotional and spiritual growth at the University. The tabulated results of the questionnaire presented to them is as follows:

TOTAL — 30 SURVEYS. FEB. 10. 71.

Years in college: 3 1/2 YR AVERAGE.

Major: __________

Sex: M-16 F - 14

Residence: On campus 4 Off campus 26

Here is a list of situations that may have had an impact on your educational and spiritual growth.

O	O	X		
4	1	4	1.	Meeting students in the students union.
3			2.	Talking with a small group of students in a coffee shop.
9	1		3.	Talks with a friendly instructor in his office.
3	1	1	4.	Reading in the library.
7	4		5.	Reading and study in your own room.
9	2	2	6.	Sports activities with fellow students.
5	4		7.	Leisure time with other students.
	1	2	8.	Being on the town.
6	2	2	9.	Lying on the grass and watching people.
1		2	10.	Reading and browsing in bookstores.
6		2	11.	Going to the movies.
3		1	12.	Concerts and plays.
5	1	1	13.	Examinations.
7		2	14.	Writing term papers.
6	2	1	15.	Writing papers and doing research for your own amusement.
2		5	16.	Laboratory study.
1		2	17.	Talks with advisor, in his office.
7	5		18.	Talks with your room-mate, or friends, at home.
1		2	19.	Eating together in the students dining commons or students union.
1		2	20.	Eating together in small restaurants.
3		3	21.	Discussions over a glass of beer.
8	1		22.	Preparing for examinations.
6		2	23.	Frequent discussions in a small group of friends in a restaurant or bar.
0	2	1	24.	Frequent discussions in a small group of friends on campus.
2	1	3	25.	Talks with a friendly instructor off campus, in a bar or cafe.
5		2	26.	Exploring shops.

O Please circle the seven of these which have played the largest part in your own education, and your intellectual, spiritual and emotional growth.

O Indicate the most significant one of the seven.

X Please also mark with an 'X' if any of these activities definitely did not contribute to your education.

Note in the first column, that the activities which scored highest, as being among the seven most meaningful activities are: Reading and study in your own room (17), Talks with your roommate or friends at home (17), Leisure time with other students (15), Reading and browsing in bookstores (11), and Frequent discussions in a small group of friends on campus (10).

Rated next and about equal, were: Sports activities with fellow students (9), Talks with a friendly instructor in his office (9), Talking with a small group of students in a coffee shop (8), Reading in the library (8), Discussion over a glass of beer (8), and Preparing for examinations (8).

The above results makes the point that the informal activities of shops and the more formal educational activities contribute equally to the growth process of students.

Given then, that shops are an important part of a university environment, how should they be located with respect to the campus? Most university towns, still separate their commercial areas from the campus proper. Given the arguments for shops being an integral part of the learning and growing process, and that there are important reasons for fusing the university with the town around it, in general (see Town Integrated with Campus), we propose that the university lease land to shopowners, and encourage them to locate on busy corners on campus, so that the shops are also accessible to the general public. Therefore:

Encourage privately owned and managed shops, restaurants, cafes, theaters, etc., to locate on campus, on busy street corners, so that they are accessible to both the campus population and the general public.

TOWN INTEGRATED WITH CAMPUS

(SEE CAMPUS)

(ACTIVITY NUCLEI

(SEE STUDENT GATHERING)

FIRST DRAFT

RELAX - LEISURE IS A PART OF LEARNING

You cannot get a good education in a place which runs like a factory, with a hectic work pace, and never the chance for a relaxing physical diversion.

Therefore: Wherever you are on campus, you are within 400-500 feet of a place which is designed for leisure - a garden, a swimming pool, gym, cafe, tennis courts, etc.

The pace of classwork can kill learning. If there is never the chance to stop and relax, to get absorbed in some simple, physical thing, ideas won't have a chance to sink in. People always seek out a balance between conscious, directed work and relaxation, where the work can settle into the background, and come into some perspective. There is empirical evidence that problems are solved and insights achieved, when the work pace is intertwined with periods of complete relaxation. (Reference)

But many of the environments that really support a relaxed, leisure mood, are not immediately available during the day on campus. They are not close enough and varied enough to be available spontaneously, when you need them. Also, the sports activities are often developed in such a sophisticated way that they are not really a viable part of leisure for "amateurs".

Our survey of 13 students, randomly selected, on the U of O campus, concerning this question of relaxation, turns up the following. First of all, every subject indicated that, for him, relaxation was an essential part of education. During the past two weeks every subject had engaged in such activities as shooting baskets, billiards, swimming, resting under a tree, judo, table games, etc.

Half the subjects reported, that during the last two weeks they had experienced trying to use a leisure facility, and giving up, finding it too crowded.

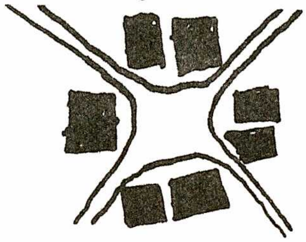
77% answered "yes" to the question, would you enjoy periods of leisure such as sports, private walks, sitting in gardens, swimming, pool, table tennis, croquet, etc., more often if leisure facilities were distributed throughout the campus, rather than concentrated, as they are now?

ACTIVITY NUCLEI

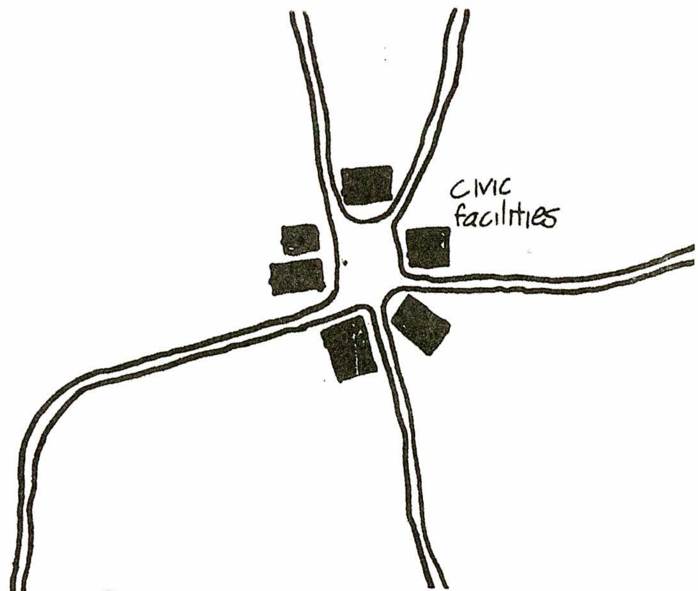
(SEE STUDENT GATHERING)

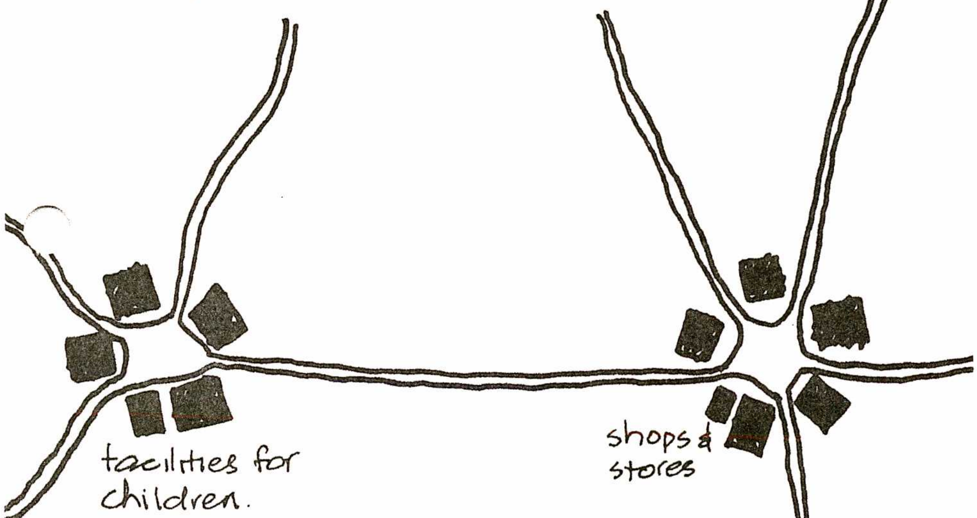
Campus Library Decentralized
Activity Nuclei
Stacks + Carrels Integrated

Activity Nuclei



Community facilities scattered individually through the city do nothing for the life of the city.





One of the greatest problems in existing communities, is the fact that the available public life in them is spread so thin, that it has no impact on the community, and is not in any real sense "available" to the members of the community. Studies of pedestrian behavior make it clear that people seek out concentrations of other people, whenever they are available, (e.g. *Jan Gehl, "Mennesker til Fods (Pedestrians)", Arkitekten, No. 20, 1968.*)

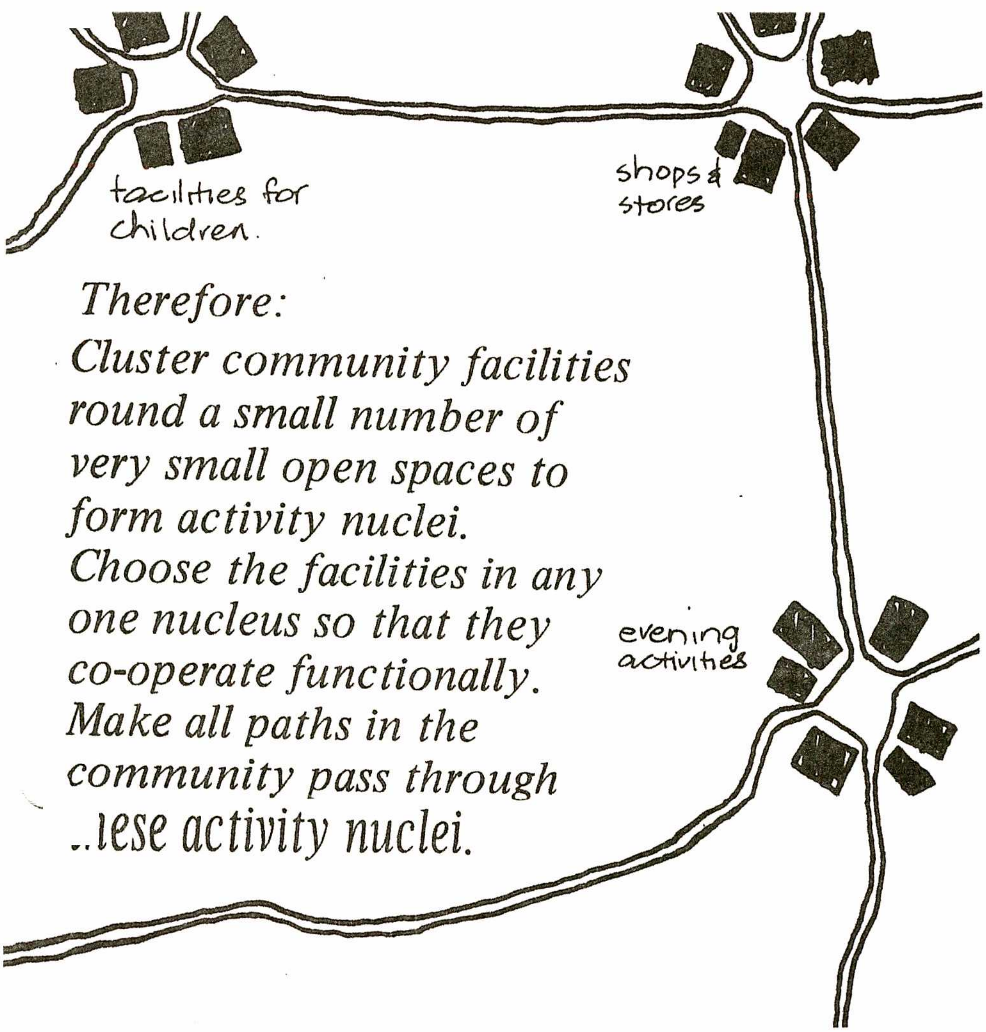
To create these concentrations of people in a community, facilities must be grouped densely round very small public open spaces which can function as nuclei – and all pedestrian movement in the community channelled to pass through these nuclei. These nuclei need two properties.

First, the facilities grouped around any one activity nucleus, must be carefully chosen for their symbiotic relationships. It is definitely not enough merely to group communal functions in so called community centers. For example, church, cinema, kindergarten, and police station are all community facilities – but they do not support one another mutually. Different people go to them, at different times, with different things in mind. There is no point in grouping them together. To create intensity of action, the facilities which are placed together round any one nucleus, must function in a cooperative manner, and must attract the same kinds of people, at the same times of day.

Therefore:

Cluster community facilities round a small number of very small open spaces to form activity nuclei. Choose the facilities in any one nucleus so that they co-operate functionally. Make all paths in the community pass through these activity nuclei.

(continued over)



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(continued over)

DRAFT

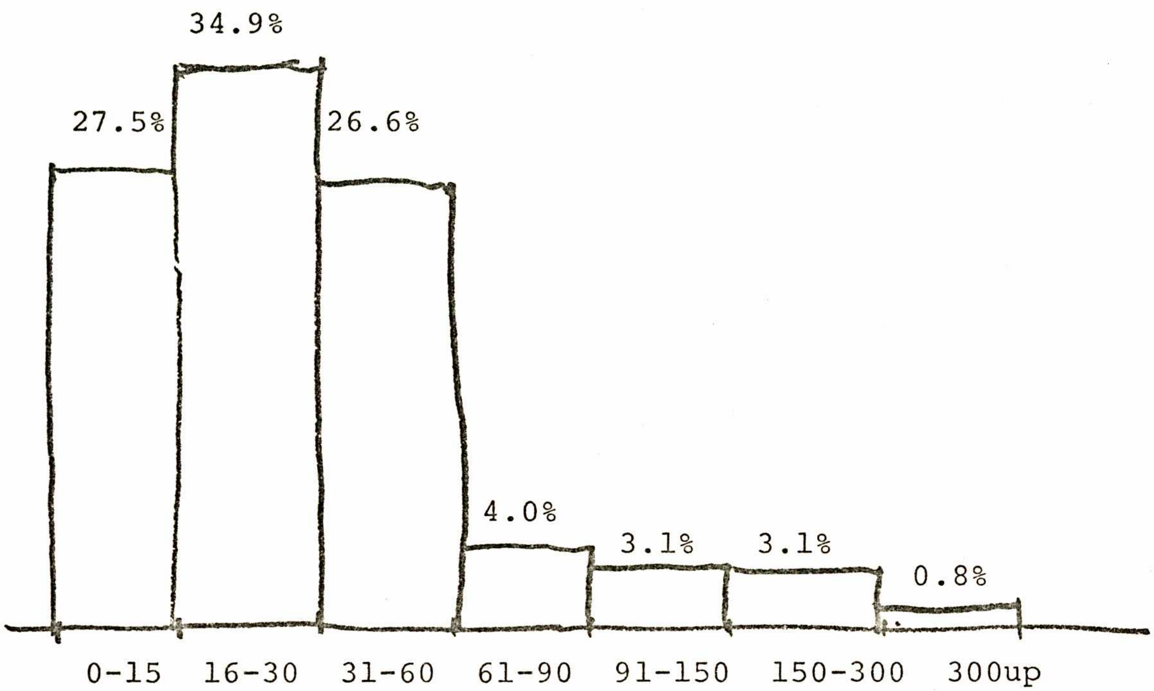
CLASSROOM SIZE AND DISTRIBUTION

Have you ever tried to hold an intimate seminar for ten students, in a huge classroom which has seventy or eighty seats.

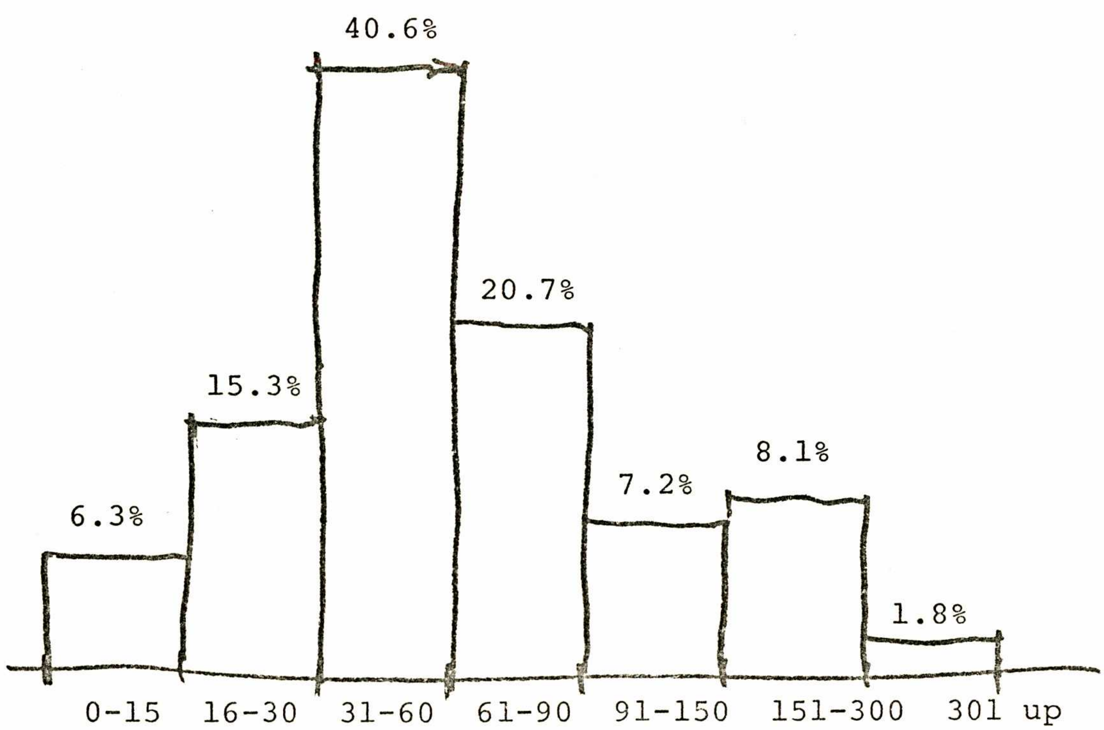
The following histograms show the relative numbers of different sized classes held at the University of Oregon in the Fall of 1970, and the relative numbers of available classrooms in the different size ranges. We believe these figures are typical for many universities.

It is obvious, at a glance, that there are too many large classrooms, and too few small classrooms. Most of the classes actually held are relatively small seminars and sections, while most of the classrooms are in the 30-150 size range. These large classrooms may have reflected the teaching methods of an earlier period, but they certainly do not conform to the actual practice of teaching in 1970.

The effect of this discrepancy is clear. Many, or perhaps most, of the classes which are held, are held in classrooms that are too large; the rooms are half empty; students tend to sit at the back; the teacher faces rows of empty seats. For example, in the Fall of 1970, 31 classes with less than 40 students in them, had to hold their classes in a room that had more than 400 seats. The intimate and intense atmosphere typical of a good small class cannot be achieved under these circumstances.



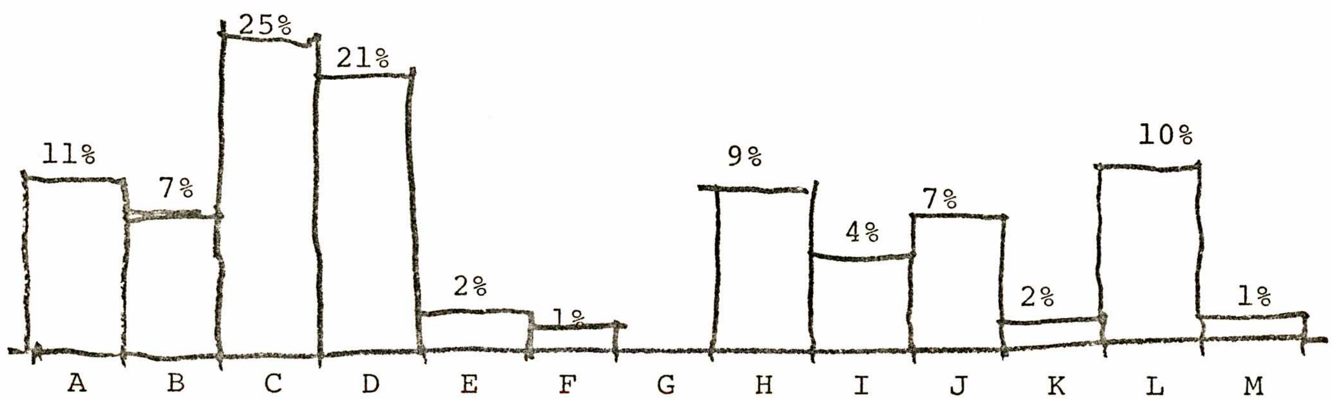
ACTUAL CLASSES HELD



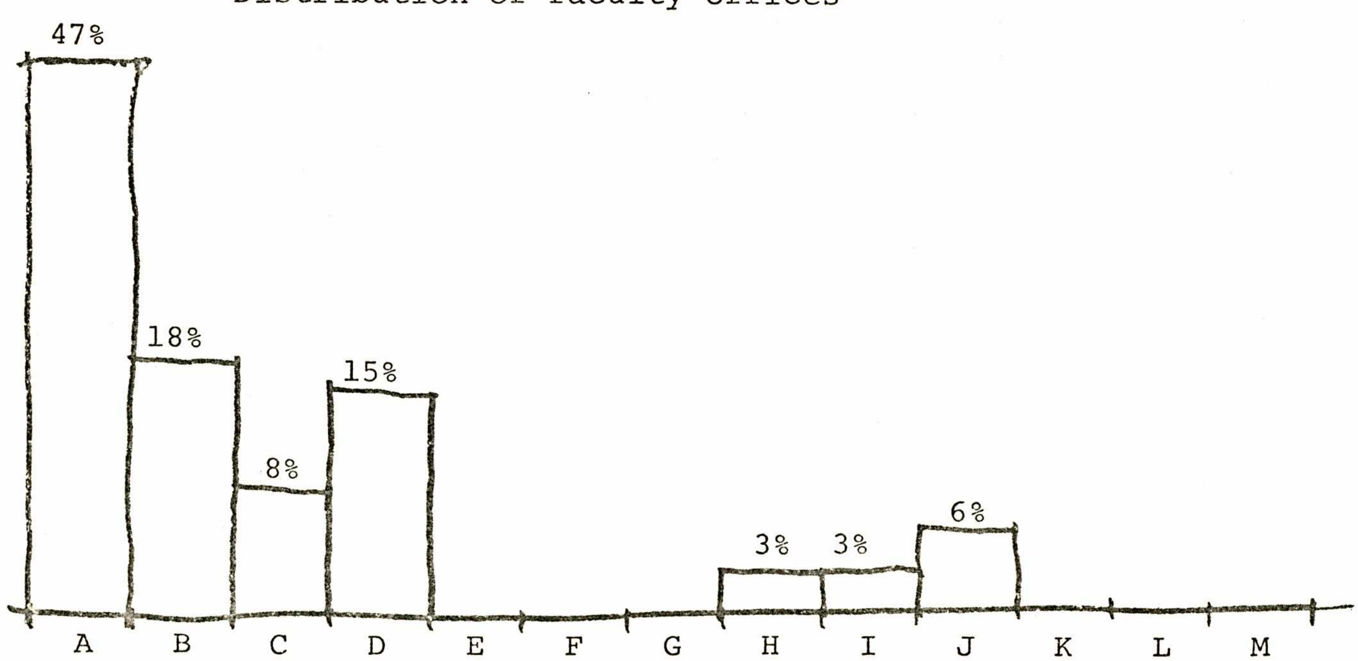
AVAILABLE CLASSROOMS

The spatial distribution of classes is often as poorly adapted to the actual teaching conditions, as the size distribution. The following histograms compare the distribution of classrooms in different parts of sectors of the University of Oregon, with the distribution of faculty and student offices.

The letters A-M represent sectors of the University of Oregon, each sector being an area about 1000 feet in diameter.



Distribution of faculty offices



Distribution of classrooms

Once again, the effect of this discrepancy tends to defeat the teaching process. It is typical of the smaller classes which we have found so common, that teachers and students have a closer personal relationship than in earlier times, that teachers know most of their students by name, and that a great deal of the teaching goes on before and after class, in the informal groups which naturally grow out of formal classes. This kind of teaching can happen most easily, if the people involved in the class - both teachers and students - are fairly near their offices - so that discussions which begin in the classroom are able to continue in the office and the research laboratory. When the classrooms are very far,a long walk from the teacher's office, the chances of this kind of informal teaching are drastically reduced.

There is a further important reason for making the spatial distribution of classrooms correspond to the spatial distribution of faculty offices. Large blocks of classrooms add to the institutional atmosphere of the university. They make the classes seem impersonal and sterile, and they add to the student's feeling of being processed through the school.

To give classrooms some identity, they should be associated with faculty, research groups, departments. If a faculty member held all his classes in one classroom, class work could be left on the walls and blackboards, and the classroom would slowly take on the character of these classes, and of the instructor himself. The same for classrooms associated with research teams, and classrooms oriented especially to departments. People would begin to feel as though they belonged in such places, and spend more time there. Since most faculty teach an average of about ten hours a week, few classrooms would need to have more than three or four instructors teaching in them.

We may conclude then, that in order to make classes fully effective, the distribution of classroom sizes must correspond to the distribution of actual class sizes; and further, that the number of classrooms in any given sector of the university, must correspond to the number of faculty offices there and that within each sector the classroom sizes must once again be distributed according to the distribution of actual class sizes, in order to allow maximum student faculty contact. Therefore:

Construct classrooms in such a way that the total number of classrooms in any given sector of the university is proportional to the number of faculty offices in that sector, and so that the distribution of classroom sizes within each sector, and within the university taken as a whole follows these percentages:

0-15	16-30	31-60	61-90	91-150	151-300	300 and up
27%	35%	27%	4%	3%	3%	1%

If the existing distribution of classrooms is widely different from the one which this pattern requires, it is easy to construct a matrix, showing for which classroom sizes, in which sectors, there are too few, and too many, classrooms. It is then easy to convert classrooms to other uses, in those sectors where there are too many, and to create new classrooms, of appropriate sizes, in those sectors where there are too few.

UNIVERSITY AS A MARKETPLACE

(SEE CAMPUS)

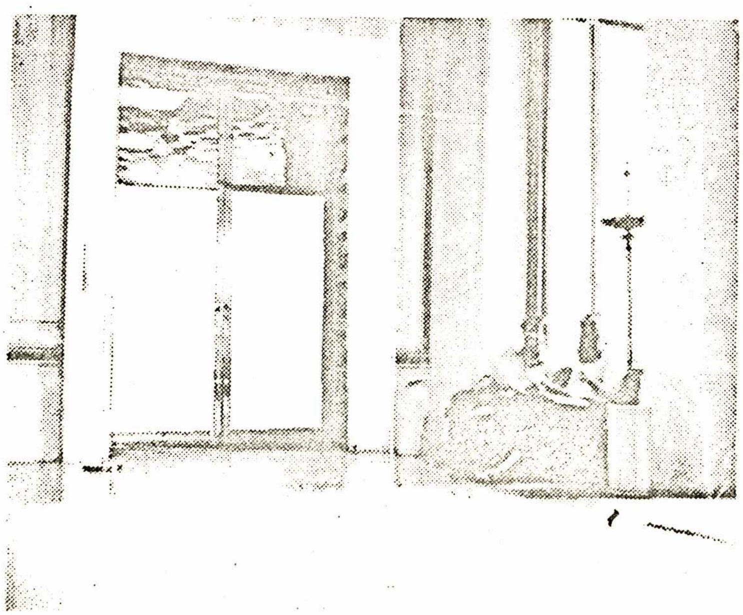
Seats Outside Meeting Rooms

People tend to linger and talk in small groups, after meetings.

In fact, a great deal of important business is transacted in these small groups — often more than in the meeting itself. It is essential that these kinds of groups have the chance to take hold. Once a meeting is over, people leave the room in clusters: some go off to their cars or the subway, some go off to a bar or cafe, and some stay on to talk a bit. The groups that stay on need a place: There should be small places where people can sit and chat, just off the circulation path where the meeting room spills out.

Context
Meeting rooms where political meetings, seminars, or classes, are held.

Therefore: Locate seating alcoves outside of meeting rooms, just off the circulation path.



Houses with smooth hard walls made of prefabricated panels, concrete, gypsum, steel, aluminum or glass, always stay impersonal and dead. How can we build houses so personal and alive, that 100,000 houses will be as different from one another as 100,000 people are.

Thick Walls

In the world we live in today, newly built houses and apartments are more and more standardised. People no longer have a chance to make them personal and individual. A personal house tells us about the people who live there. A childs swing hanging in a doorway reflects the attitude of parents to their children. A window seat overlooking a favorite bush supports a contemplative, dreamy nature. Open counters between kitchen and living space are specific to informal family life; small closable hatches between the two are specific to more formal styles. An open shelf around a room should be seen at one height, to display a collectors porcelain, best seen from above; at another height and depth if it is to be used to support a photographers latest pictures; at another height again for setting down drinks in the house of a perennial party-giver. A large enough fireplace nook, with enough built in seats, invites a family of six to sit together.

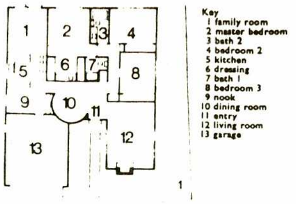
Each of these things gives us a sense about the people living in the house, because each expresses some

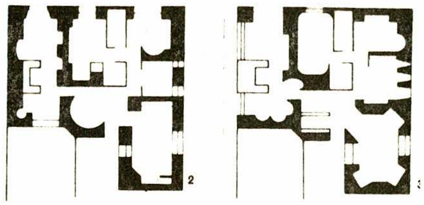
special personal need. Everyone needs the opportunity to express his own way of life, in the place he lives. (continued over)

Therefore: Give the walls "depth", at least 40 cm, which is created by a hand-carvable rigid space frame, in which a continuous variety of niches, shelves, seats, cupboards, leaning posts and window seats can occur. Make it of materials which are readily available on the retail market, and easily cut, modified, painted, nailed, glued, replaced by hand, using only tools available at any hardware store. Possible examples are wood, plywood, fiberglass, styrofoam, polystyrene.

Thick Walls

These drawings show the plan of a conventional California tract house. The first drawing shows the plan as it is today. The second and third drawings show what two such houses, modified to have thick walls, might be like after three or four years of occupancy.





Problem (continued)
This pattern was published, in full, by *Christopher Alexander, Thick Walls, Architectural Design, July 1968, pp. 324-326.*

Here are more excerpts from that paper:

It is clear that under traditional conditions, personal adaptation was easily assured. The two salient conditions were:

1. People lived in the same place for very long periods, often for whole lifetimes.

2. Houses were made of hand-processed, materials like wood, brick, mud, straw, plaster, which are easily modified by hand, by the inhabitants themselves.

Under these conditions, personal adaptation follows almost automatically from the fact of occupancy.

However, in a modern technological society, neither of these two conditions holds good. People move house frequently, and the houses are increasingly built of factory made, factory finished, materials like 4' x 8' sheets of finished plaster board, aluminum windows, prefabricated baked enamel steel kitchens, glass, concrete, steel, — these materials do not lend themselves at all to the gradual modification which personal adaptation requires: indeed, the processes of mass production, and mass adaptation provided by technological means are almost directly incompatible with the possibility of personal adaptation. The question then is this: what kind of house is both compatible with modern means of production, and also capable of providing a high degree of personal adaptation.

Several solutions to this problem have been proposed by modern architects: however, these solutions are all deficient in some crucial respect:

Solution 1. Miesian universal space.

It is assumed that the glass box is so neutral, that any individual and personal form of life can find its full expression against this very neutral backdrop. *The trouble is, of course, that the backdrop is in fact tyranical, not neutral.*

Solution 2. Custom made houses.

At one time many architects were aiming for this ideal. However, it is now clear that:

No more than 5% of all houses are built by custom architects; and there is no prospect that this proportion can be significantly increased.

Solution 3. Do it yourself houses.

The trouble with this kind of solution is obvious. It may be possible to coerce slum dwellers and poverty stricken people to construct their own dwellings — *but once people have enough money to give them freedom of action, most of them are not willing to undertake major do it yourself construction;* this is especially true in a society where people are constantly moving from place to place. *People want to move into finished houses.*

Solution 4. Architectural variety built in by a designer.

In certain housing schemes, the designer has tried to build in the necessary variety by making each house just a little different from the next one. This has never yet succeeded. *The variety which a designer can build into a large housing project is necessarily trivial — it creates superficial differences* — but the differences are not designed to support any specific idiosyncracies, and they do not therefore succeed in creating any genuine feeling of personal identity.

Solution 5. Flexible interchangeable components.

This kind of solution has three drawbacks:

a. *Even though the flexibility seems as though it ought to provide for a great deal of variety, in fact the products of such variation all bear the unmistakeable stamp of the "system".* So long as you choose from a finite range of preselected alternatives which someone else has made available to you, your choice is very limited indeed: and you never really manage to create a truly personal environment: you never actually escape the system. As Sartre says: "No man wants to be a cipher in someone elses system".

b. *A house in which many of the components are genuinely flexible, would have an air of impermanence about it, which would destroy the feeling of security required of dwellings — especially by women.*

c. *Flexible systems, like systems of partitions, have to be highly constrained,* in order to achieve flexibility and interchangeability of components — with the result that many other characteristics, essential for other functional reasons, will be sacrificed.

Tendencies
1. Technological forces make mass production of most of the components in a house inevitable.

2. People seek the identity of a house that "feels like them": and they seek adaptation to their own personal idiosyncracies.

3. People will make the adaptation by incremental changes only if the materials in the building allow them to do so with home tools.

4. When people are offered a sufficient variety of houses to choose from, they can make the adaptation to their personal life-style, and needs by choice.

5. People want to buy a finished house; they are not looking for houses they will have to finish before they can move in.

6. Most people, women in particular, want a sense of security and permanence in a house; they seek a house which is fixed and solid — not made of impermanent movable parts.

7. People resist the sterility and monotony of large expanses of homogeneous surface. They seek variation which is at the scale of millimeters and inches. The more intricate an object or surface is; the more they can identify with it, and the more personalized it becomes.

8. People move from one house to another very often. In many cases, they stay in one house for no more than two or three years.

It is clear that these tendencies can only be resolved by some form of house which allows for incremental changes, so that inhabitants can adapt the house to their own personal needs while they live in it.

There is only one source of a sufficiently rich variety—and that is in the people themselves. In order to get this variety, the houses must be designed to accumulate variety, so that the variety of the inhabitants who live in them, rubs off on them.

This means every house must be two characteristics.

1. It must be so constructed that each new family can leave their mark on it — it must, in other words, invite incremental fine adjustments.

2. It must be so constructed that these fine adjustments are permanent — so that they do accumulate over time, and so that the stock of available dwellings becomes progressively more and more differentiated.

Most of the identity of a dwelling lies in or near its surfaces—in the three or four feet near the walls, floors and ceilings. This is where people keep most of their belongings, this is where special lighting fixtures are, this is where special built in furniture is placed, this is where the special cosy nooks and corners are, that individual family members make their own, this is where the identifiable small scale variation is, this is the place where people can most easily make changes, and see the product of their own craftsmanship.

We must therefore give the three or four feet near walls, floors, and ceilings, the two characteristics defined above. They must be easy to modify with home tools; and the modifications must be permanent.

In order to give these walls the two characteristics defined above, they must be made of some material which is inherently structural — so that however much of it gets carved out, the whole remains rigid, and the surface remains continuous no matter how much is removed or added, it requires only paint or paper or cloth covering to finish it. We may visualise such a material most easily, by thinking of the internal structure of a bone — which is a kind of micro-space frame. We may carve out any amount of it — the rest still stands. This is the intention of *hand-carvable-space-frame,* as defined in the pattern.

As time goes on, each family will be able to work the wall surfaces, in a very gradual, piecemeal, incremental manner. After a year or two of occupancy, each dwelling will begin to show its own characteristic pattern of niches, bay windows, breakfast nooks, seats built into the walls, shelves, closets, lighting arrangements, sunken parts of the floor, raised parts of the ceiling.

Each house has a memory; the characteristics and personalities of different human individuals can be written on these houses, these houses will become progressively more and more differentiated as they grow older, and the process of personal adaptation — both by choice, and by piecemeal modification — has room to breathe.

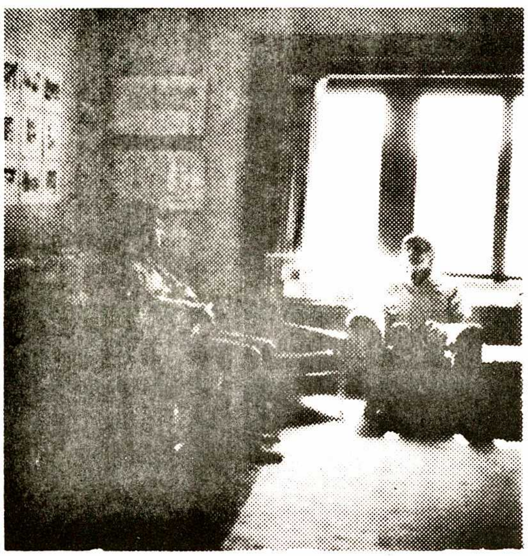
By: Christopher Alexander

1967, revised September 1970

This pattern is tentative. If you have any evidence to support or refute its current formulation, please send it to the Center for Environmental Structure, P.O. Box 5156, Berkeley, California 94705; we will add your comments to the next edition.

Light on Two Sides of Every Room

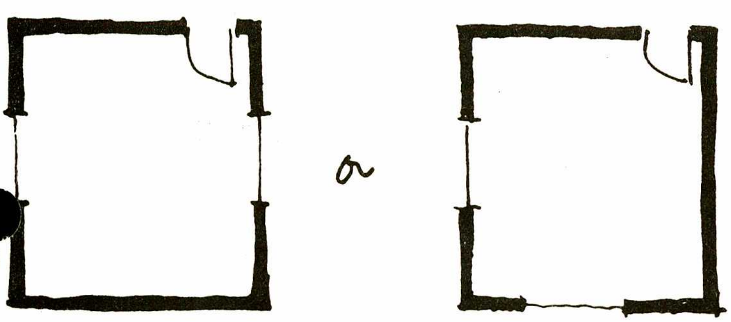
A room lit from one side only is almost always uncomfortable.



The reason for this is that the light gradient on the walls and floors inside the room is very steep, so that the part furthest from the window is uncomfortably dark, compared with the part near the window. Even worse, since there is little reflected light on the room's inner surfaces, the interior wall immediately next to the window is usually dark, creating discomfort and glare, against this light.

Although this glare may be reduced by supplementary artificial lighting, and by well designed window reveals, the most simple, and most basic way of overcoming glare, is to give every room two windows. The light from each window illuminates the wall surfaces just inside the other window, thus reducing the contrast between those walls and the sky outside. For details, and illustrations, see *R. G. Hopkinson, Lighting: Architectural Physics, Building Research Station, London, 1963, pp. 29 and 103.* (continued over)

Therefore: Give every room used during the daytime natural light by windows or skylights from at least two directions.



Problem (continued)
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1. reduce the light gradient in the room.

2. directly or indirectly illuminate walls immediately adjacent to windows.

Context
This pattern, of course, applies only to rooms with windows. In fact we do believe that all rooms used during the day need windows, not only for natural light, but also because people need some relationship to the outdoors. See *Windows Overlooking Life.*

By: Christopher Alexander, Sanford Hirshen, Sara Ishikawa, Christie Coffin, Shlomo Angel.

August 1969 revised June 1970

Students Near Faculty Offices

University as a Marketplace

Primary Groups Among Students
& Faculty

Light on two Sides of Every Room

Thick Walls

Houses with smooth hard walls made of prefabricated panels, concrete, gypsum, steel, aluminum or glass, always stay impersonal and dead. How can we build houses so personal and alive, that 100,000 houses will be as different from one another as 100,000 people are.

Thick Walls

In the world we live in today, newly built houses and apartments are more and more standardised. People no longer have a chance to make them personal and individual. A personal house tells us about the people who live there. A childs swing hanging in a doorway reflects the attitude of parents to their children. A window seat overlooking a favorite bush supports a contemplative, dreamy nature. Open counters between kitchen and living space are specific to informal family life; small closable hatches between the two are specific to more formal styles. An open shelf around a room should be seen at one height, to display a collectors porcelain, best seen from above; at another height and depth if it is to be used to support a photographers latest pictures; at another height again for setting down drinks in the house of a perennial party-giver. A large enough fireplace nook, with enough built in seats, invites a family of six to sit together.

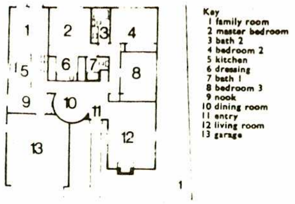
Each of these things gives us a sense about the people living in the house, because each expresses some

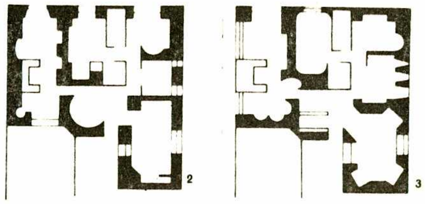
special personal need. Everyone needs the opportunity to express his own way of life, in the place he lives. (continued over)

Therefore: Give the walls "depth", at least 40 cm, which is created by a hand-carvable rigid space frame, in which a continuous variety of niches, shelves, seats, cupboards, leaning posts and window seats can occur. Make it of materials which are readily available on the retail market, and easily cut, modified, painted, nailed, glued, replaced by hand, using only tools available at any hardware store. Possible examples are wood, plywood, fiberglass, styrofoam, polystyrene.

Thick Walls

These drawings show the plan of a conventional California tract house. The first drawing shows the plan as it is today. The second and third drawings show what two such houses, modified to have thick walls, might be like after three or four years of occupancy.





Problem (continued)
This pattern was published, in full, by *Christopher Alexander, Thick Walls, Architectural Design, July 1968, pp. 324-326.*

Here are more excerpts from that paper:

It is clear that under traditional conditions, personal adaptation was easily assured. The two salient conditions were:

1. People lived in the same place for very long periods, often for whole lifetimes.

2. Houses were made of hand-processed, materials like wood, brick, mud, straw, plaster, which are easily modified by hand, by the inhabitants themselves.

Under these conditions, personal adaptation follows almost automatically from the fact of occupancy.

However, in a modern technological society, neither of these two conditions holds good. People move house frequently, and the houses are increasingly built of factory made, factory finished, materials like 4' x 8' sheets of finished plaster board, aluminum windows, prefabricated baked enamel steel kitchens, glass, concrete, steel, — these materials do not lend themselves at all to the gradual modification which personal adaptation requires: indeed, the processes of mass production, and mass adaptation provided by technological means are almost directly incompatible with the possibility of personal adaptation. The question then is this: what kind of house is both compatible with modern means of production, and also capable of providing a high degree of personal adaptation.

Several solutions to this problem have been proposed by modern architects: however, these solutions are all deficient in some crucial respect:

Solution 1. Miesian universal space.

It is assumed that the glass box is so neutral, that any individual and personal form of life can find its full expression against this very neutral backdrop. *The trouble is, of course, that the backdrop is in fact tyranical, not neutral.*

Solution 2. Custom made houses.

At one time many architects were aiming for this ideal. However, it is now clear that:

No more than 5% of all houses are built by custom architects; and there is no prospect that this proportion can be significantly increased.

Solution 3. Do it yourself houses.

The trouble with this kind of solution is obvious. It may be possible to coerce slum dwellers and poverty stricken people to construct their own dwellings — *but once people have enough money to give them freedom of action, most of them are not willing to undertake major do it yourself construction;* this is especially true in a society where people are constantly moving from place to place. *People want to move into finished houses.*

Solution 4. Architectural variety built in by a designer.

In certain housing schemes, the designer has tried to build in the necessary variety by making each house just a little different from the next one. This has never yet succeeded. *The variety which a designer can build into a large housing project is necessarily trivial — it creates superficial differences* — but the differences are not designed to support any specific idiosyncracies, and they do not therefore succeed in creating any genuine feeling of personal identity.

Solution 5. Flexible interchangeable components.

This kind of solution has three drawbacks:

a. *Even though the flexibility seems as though it ought to provide for a great deal of variety, in fact the products of such variation all bear the unmistakeable stamp of the "system".* So long as you choose from a finite range of preselected alternatives which someone else has made available to you, your choice is very limited indeed: and you never really manage to create a truly personal environment: you never actually escape the system. As Sartre says: "No man wants to be a cipher in someone elses system".

b. *A house in which many of the components are genuinely flexible, would have an air of impermanence about it, which would destroy the feeling of security required of dwellings — especially by women.*

c. *Flexible systems, like systems of partitions, have to be highly constrained,* in order to achieve flexibility and interchangeability of components — with the result that many other characteristics, essential for other functional reasons, will be sacrificed.

Tendencies
1. Technological forces make mass production of most of the components in a house inevitable.

2. People seek the identity of a house that "feels like them": and they seek adaptation to their own personal idiosyncracies.

3. People will make the adaptation by incremental changes only if the materials in the building allow them to do so with home tools.

4. When people are offered a sufficient variety of houses to choose from, they can make the adaptation to their personal life-style, and needs by choice.

5. People want to buy a finished house; they are not looking for houses they will have to finish before they can move in.

6. Most people, women in particular, want a sense of security and permanence in a house; they seek a house which is fixed and solid — not made of impermanent movable parts.

7. People resist the sterility and monotony of large expanses of homogeneous surface. They seek variation which is at the scale of millimeters and inches. The more intricate an object or surface is; the more they can identify with it, and the more personalized it becomes.

8. People move from one house to another very often. In many cases, they stay in one house for no more than two or three years.

It is clear that these tendencies can only be resolved by some form of house which allows for incremental changes, so that inhabitants can adapt the house to their own personal needs while they live in it.

There is only one source of a sufficiently rich variety—and that is in the people themselves. In order to get this variety, the houses must be designed to accumulate variety, so that the variety of the inhabitants who live in them, rubs off on them.

This means every house must be two characteristics.

1. It must be so constructed that each new family can leave their mark on it — it must, in other words, invite incremental fine adjustments.

2. It must be so constructed that these fine adjustments are permanent — so that they do accumulate over time, and so that the stock of available dwellings becomes progressively more and more differentiated.

Most of the identity of a dwelling lies in or near its surfaces—in the three or four feet near the walls, floors and ceilings. This is where people keep most of their belongings, this is where special lighting fixtures are, this is where special built in furniture is placed, this is where the special cosy nooks and corners are, that individual family members make their own, this is where the identifiable small scale variation is, this is the place where people can most easily make changes, and see the product of their own craftsmanship.

We must therefore give the three or four feet near walls, floors, and ceilings, the two characteristics defined above. They must be easy to modify with home tools; and the modifications must be permanent.

In order to give these walls the two characteristics defined above, they must be made of some material which is inherently structural — so that however much of it gets carved out, the whole remains rigid, and the surface remains continuous no matter how much is removed or added, it requires only paint or paper or cloth covering to finish it. We may visualise such a material most easily, by thinking of the internal structure of a bone — which is a kind of micro-space frame. We may carve out any amount of it — the rest still stands. This is the intention of *hand-carvable-space-frame,* as defined in the pattern.

As time goes on, each family will be able to work the wall surfaces, in a very gradual, piecemeal, incremental manner. After a year or two of occupancy, each dwelling will begin to show its own characteristic pattern of niches, bay windows, breakfast nooks, seats built into the walls, shelves, closets, lighting arrangements, sunken parts of the floor, raised parts of the ceiling.

Each house has a memory; the characteristics and personalities of different human individuals can be written on these houses, these houses will become progressively more and more differentiated as they grow older, and the process of personal adaptation — both by choice, and by piecemeal modification — has room to breathe.

By: Christopher Alexander

1967, revised September 1970

This pattern is tentative. If you have any evidence to support or refute its current formulation, please send it to the Center for Environmental Structure, P.O. Box 5156, Berkeley, California 94705; we will add your comments to the next edition.

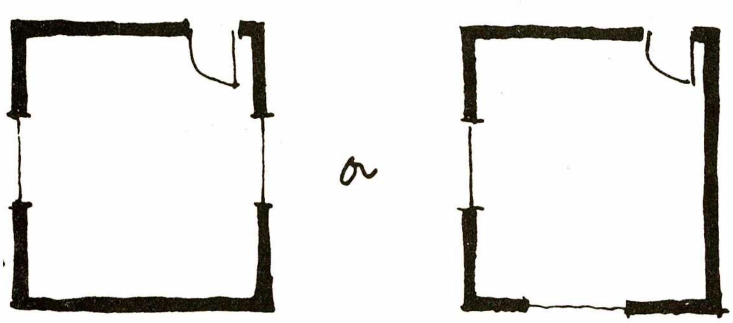
Light on Two Sides of Every Room

A room lit from one side only is almost always uncomfortable.

The reason for this is that the light gradient on the walls and floors inside the room is very steep, so that the part furthest from the window is uncomfortably dark, compared with the part near the window. Even worse, since there is little reflected light on the room's inner surfaces, the interior wall immediately next to the window is usually dark, creating discomfort and glare, against this light.

Although this glare may be reduced by supplementary artificial lighting, and by well designed window reveals, the most simple, and most basic way of overcoming glare, is to give every room two windows. The light from each window illuminates the wall surfaces just inside the other window, thus reducing the contrast between those walls and the sky outside. For details, and illustrations, see *R. G. Hopkinson, Lighting: Architectural Physics, Building Research Station, London, 1963, pp. 29 and 103.* (continued over)

Therefore: Give every room used during the daytime natural light by windows or skylights from at least two directions.



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1. reduce the light gradient in the room.

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Context
This pattern, of course, applies only to rooms with windows. In fact we do believe that all rooms used during the day need windows, not only for natural light, but also because people need some relationship to the outdoors. See *Windows Overlooking Life.*

By: Christopher Alexander, Sanford Hirshen, Sara Ishikawa, Christie Coffin, Shlomo Angel.

August 1969 revised June 1970

Primary Groups Among Students & Faculty
Students Near Faculty Offices
Light on two Sides of Every Room

Thick Walls

Entrance Location

Circulation Redlines

Entrance Location

's annoying to search around a public building, looking for the proper entrance.

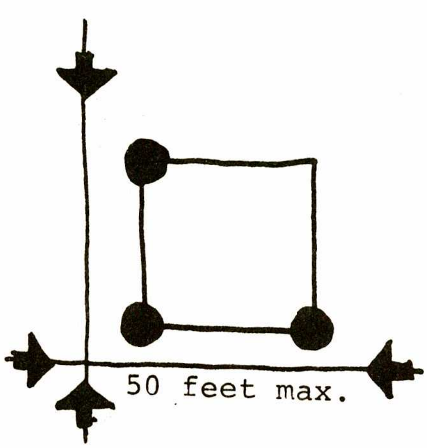
1. Consciously or unconsciously, a person walking works out his path some distance ahead, so as to take the shortest path. *(See Tyrus Porter, A Study of Path Choosing Behavior, Thesis, University of California, Berkeley, 1964; in particular the study of the Kaiser Center Lobby.)*
When he is approaching a building, this means he must be able to see the entrance early. If the entrance is not visible, when the building itself becomes visible, he cannot work out his path.

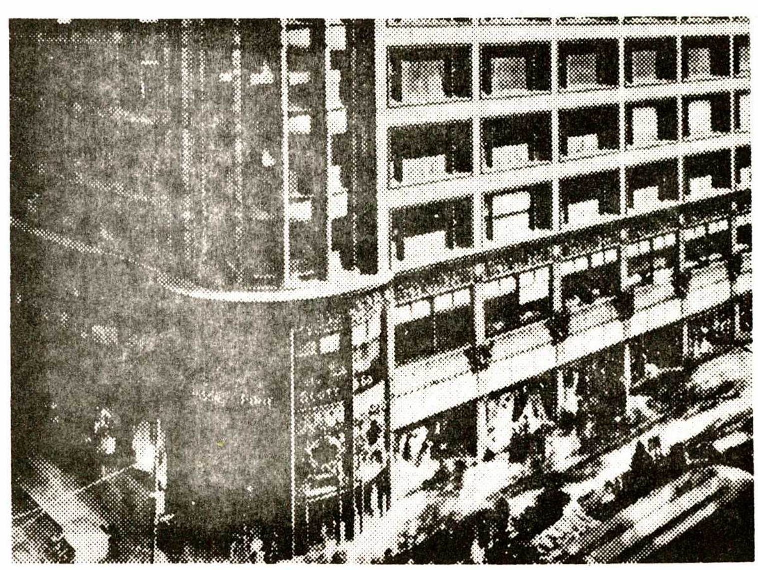
2. No one likes to back-track or to retrace his steps. If he has to walk along the building for some distance, before being able to enter, the chances are high that he will have to turn back after entering, and walk back in the direction he came from.

Furthermore, if he has to walk along the building for some time before he can enter, it is not only annoying for him, but he may begin to wonder whether he is going the right way, and whether he hasn't perhaps missed the proper entrance. It is hard to pin this down numerically. For the moment, we have fixed on 50 feet to designate an order of magnitude. No one is bothered by walking along blind walls less than 50 feet long; if they get much longer, it begins to be annoying.

Therefore: Place the entrances in such a way as to satisfy the following two criteria.

1. From any approach to the building an entrance is visible as soon as the building itself becomes visible.
2. Regardless of the direction of approach, the walk along the building is not more than about 50' before reaching an entrance.





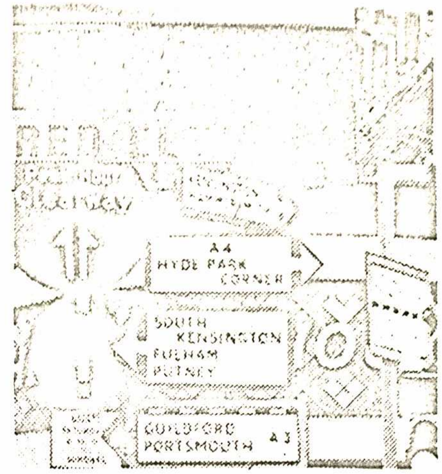
Entrance Location

By: Christopher Alexander, Sara Ishikawa, Murray Silverstein.

July 1968 revised June 1970

This pattern is tentative. If you have any evidence to support or refute its current formulation, please send it to the Center for Environmental Structure, P.O. Box 5156, Berkeley, California 94705; we will add your comments to the next edition.

Circulation Realms



In many modern public buildings and in many parts of cities the problem of disorientation is acute. People have no idea where they are, and they experience considerable mental stress as a result.

Kevin Lynch reports:

". . . the terror of being lost comes from the necessity that a mobile organism be oriented in its surroundings. Jaccard quotes an incident of native Africans who became disoriented. They were stricken with panic and plunged wildly into the bush. Witkin tells of an experienced pilot who lost his orientation to the vertical, and who described it as the most terrifying experience in his life. Many other writers in describing the phenomenon of temporary disorientation in the modern city, speak of the accompanying emotions of distress."

"The Image of the City", Kevin Lynch, The MIT Press, Cambridge, Massachusetts, 1960, p. 125.

It is clear that a person must be able to orient himself in any environment, building, complex of buildings or city.

It is easiest to state the circulation problem, for the case of a complete stranger who has to find his way around the complex of buildings. Imagine yourself as the stranger, looking for a particular address, within the building. From our point of view, the building is easy to grasp, if someone can explain the position of this address to you, in a way that you can remember easily, and carry in your head while you are looking for it. To put this in its most pungent form: *A person must be able to explain any given address within the building, to any other person, who does not know his way around, in one sentence.*

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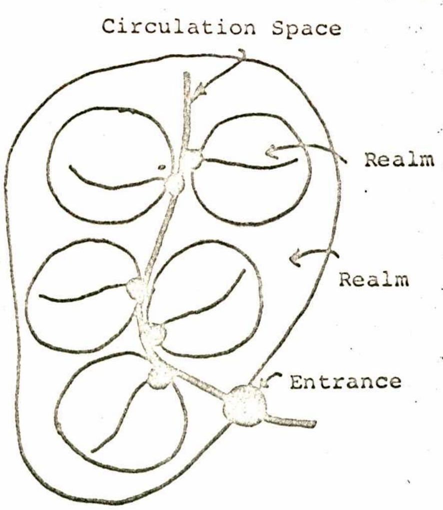


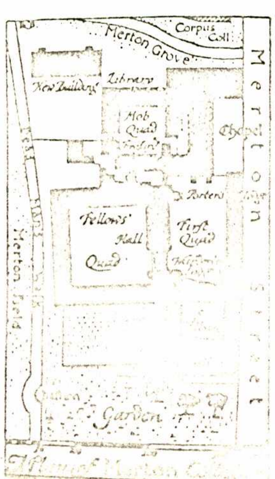
Therefore: In order to be clear, a building complex must follow four rules:

1. It is possible to identify a nested system of realms in the complex, the first and the largest of these realms being the entire complex.

2. Each of these realms has an identity which is so well defined that the realm can have a name. In particular each realm has clearly marked entrances, so that you always know when you are entering or leaving a realm.

3. Each realm has a main circulation space which opens directly from the entrances to that realm.

4. The entrances to any realm, open directly off the circulation space of the next realm above it.



If a complex of buildings has a nested set of realms, which follow these four rules, it will always be easy to find your way around it. If any one of these four rules is broken, it will be hard to make a simple mental map, for at least some addresses, and therefore hard to find your way around

Circulation Realms

Problem (continued)

At first sight, it might seem that the problem is only important for strangers—since a person who is familiar with a building can find his way around no matter how badly it is organized. However, psychological theory suggests that the effect of badly laid out circulation has almost as bad an effect on a person who knows a building, as it does on a stranger.

We may assume that every time a person goes toward some destination, he must carry some form of map or instructions in his mind. The question arises: How much of the time does he have to be consciously thinking about this map, and his destination? If he spends a great deal of time, looking out for landmarks, thinking about where to go next, etc., then his time is entirely occupied, and leaves him little time for the process of reflection, tranquil contemplation, and thought which are the basic prerequisites for a healthy functioning day. Both in his work, and in his personal emotional life, a person needs a great deal of time to digest the days events; Dream studies, for example, suggest strongly that a person will become more and more disturbed if he is prevented from the constant process of re-evaluation, and chewing over the days activities.

We conclude that any environment which requires that a person pay attention to it constantly is a bad environment; as bad for a person who knows it, as for a stranger. A good environment is one which is easy to understand.

What makes an environment easy to understand? What makes an environment confusing?

Let us imagine that a person is going to a particular address, within a building. Call this address A. The person who is looking for A, or going to A, does not go directly towards A—unless it happens to be visible from the point where he starts. Instead, he sets his journey up to form a series of steps, in which each step is a kind of temporary intermediate goal, and a taking off point for the next step. For example: First go through the gate, then to the second courtyard on the left, then to the right hand arcade of the courtyard, and then through the third door. This sequence: (Gate, Second courtyard, Right hand arcade, Third door) is a kind of map which the person has in his head.

If it is always easy to construct such a map, it is easy to find your way around the building. If it isn't easy, it is hard to find your way around.

What features must a building have, to be sure that it will always be possible to construct such a map? Let us first ask about the characteristics of the map itself.

A map works because it identifies a nested system of realms (in this case Building, Courtyard, Arcade, Place served by the doorway) with the property that you go to the entrance of a realm, then go into a main circulation space associated with that realm, and go from that circulation to the entrance of the next smaller realm. You make one decision at a time, and each decision you make narrows down the extent of the building which remains to be explored, until you finally narrow it down to the particular address you are looking for.

It seems reasonable to say that any useful map through a building complex must have this structure, and that any building complex in which you cannot create maps of this kind is confusing to be in. This is borne out by intuition. Take the following examples. Each of them has a system of realms which allows you to make such maps very easily.

An Oxford College. Here the college is made up of courts, each court has a collection of rooms called a "staircase" opening off it, and the individual suites of rooms open off these staircases. The realms are: College, Courts, Staircases, Rooms.

Manhattan. Here the city is made up of major areas, each major area has certain central streets, and arteries. The realms are: Manhattan, Districts, realms defined by the avenues (1st Avenue for instance) and realms defined by cross streets and individual buildings. Manhattan is clear because the districts are so well defined, and the realms defined by the streets are subordinate to the realms defined by the avenues.

Any simple office building with several floors, and one two-sided corridor. Here the realms are Building, Floors, Offices, the circulation space for the building being lobby and elevators, and the circulation space for each floor being the corridor.

By: Christopher Alexander, Barbara Schreiner and Ronald Walkey.

October 1970

This pattern is tentative. If you have any evidence to support or refute its current formulation, please send it to the Center for

TERRITORIAL AMBIGUITY

(SEE PEDESTRIAN PATHS)

BIKE PATHS AND RACK

(SEE BIKE PATHS)

Entrance Shape

If the entrance is not shaped so you can see it, as you approach along the building, it will be annoying to find.

A person approaching a building must be able to see the entrance clearly. Yet, many of the people approaching the building are walking along the front of the building, and parallel to it. Their angle of approach is acute. From this angle, many entrances are hardly visible.

An entrance will be visible from an acute angled approach if:

1. The entrance sticks out beyond the building line.
2. The entrance is so deeply recessed, that the void is visible from this angle. In this case, it will help further, if the recess is flared, so that the far side of the recess shows up as a source of differentiation.
3. The building front flares back gently, and the entrance sticks out into the recess so created. This will be useful, if the building is built all the way forward to the building line.

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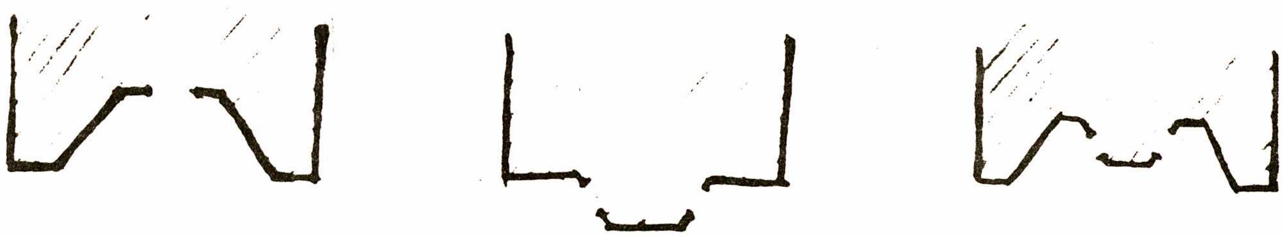
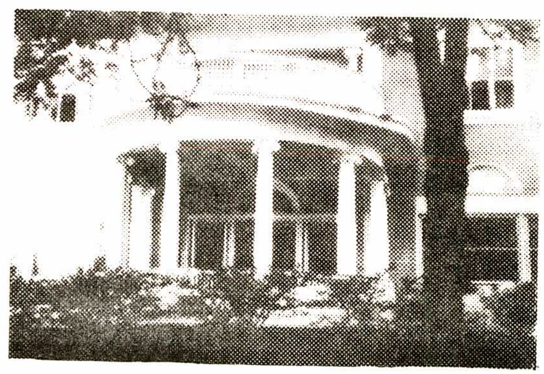
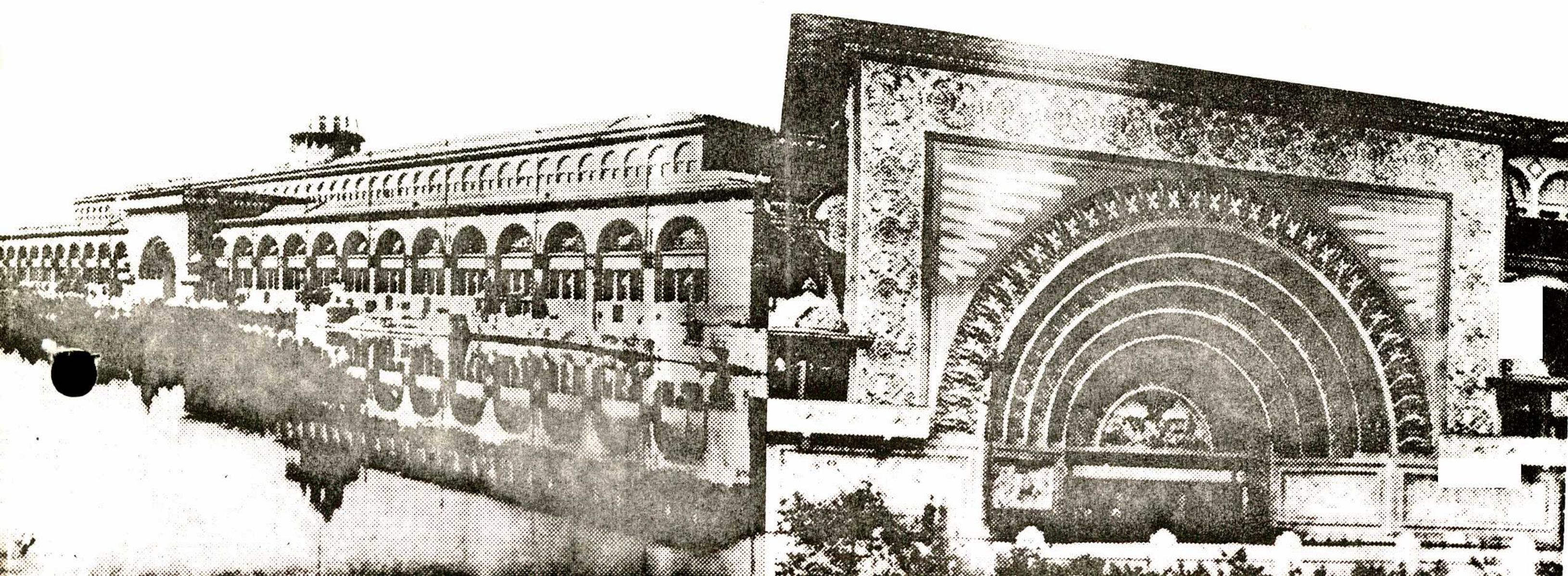


Therefore: Either project the entrance strongly beyond the building front; or set the entrance back into a flared recess; or create some combination of the above.





Problem (continued)
Although the heart of the pattern lies in these relationships there are many important refinements which are, for the moment, too hard to pin down. The relative color of the entrance, the light and shade immediately around it, the presence of mouldings and ornaments, may all play a part. Above all, it is important that the entrance be strongly differentiated from its immediate surroundings.

Context
This pattern applies to any public building on a street where there is not a path leading specifically to the entrance.

By: Christopher Alexander, Sara Ishikawa and Murray Silverstein

July 1968 revised September 1970

[illegible]

Short Corridors

". . .long corridors set the scene for everything bad about modern architecture."

Where a number of rooms are to share a circulation path, it is common practice to string them along a straight corridor. However, the intuition persists that, from a human point of view, long corridors with many rooms off them are dysfunctional: People dislike them; they represent bureaucracy and monotony.

Let us try to make this intuition more specific. What evidence is there that long corridors contribute to human uneasiness?

We refer first to a study by Mayer Spivack on non-conscious effects of long hospital corridors on perception, communication and behavior:

"Four examples of long mental hospital corridors are examined. . . It is concluded that such spaces interfere with normal verbal communication due to their characteristic acoustical properties. Optical phenomena common to these passageways obscure the perception of the human figure and face, and distort distance perception. Paradoxical visual cues produced by one tunnel created interrelated, cross-sensory illusions involving room size, distance, walking speed and time. Observations of patient behavior suggest the effect of narrow corridors upon anxiety is via the penetration of the personal space envelope." (*M. Spivack, "Sensory Distortion in Tunnels and Corridors", Hospital and Community Psychiatry, 18, No. 1, January, 1967.*)

Another piece of evidence comes from a questionnaire distributed by Silverstein in 1965. The sample was small (12), so the results must be taken with a grain of salt. The questionnaire asked people to describe in depth those elements in buildings that contributed most to impersonal and institutional feelings. Subjects reported experiences with many different building types: army barracks, dormitories, office buildings, government agencies, and so forth. The most recurring theme in their remarks was the unpleasantness associated with long corridors. A typical statement is quoted above, in the headline. (This material is unpublished; for a discussion see *Van der Ryn and Silverstein, Dorms at Berkeley, Center for Planning and Development Research, Berkeley, 1967, pp. 23-24, 62-63.*)

This evidence is speculative; it certainly does not prove the intuition. However, it is extremely suggestive.

If we assume the intuition is correct, then the question arises: how can we establish the upper limit on corridor length? Evidence suggests that there is a definite cognitive breakpoint between things seen as "long corridors". The evidence, which we present on the back, indicates that 50 feet is about the longest unit of corridor length that people feel comfortable with; much beyond 50 feet and the corridor begins to feel monotonous, institutional. (continued over)

Therefore: Make each stretch of corridor less than 50 feet; in effect, this means no more than 5 or 6 units opening off the side of any single stretch of corridor. Break longer corridors into less-than-50-foot units by jogging them, opening one side to a court, widening them into lobbies, etc.

Problem (continued)

Upper limit for corridor length.

An experiment, done by the authors, is relevant. It was found that, in the perception of rectangles, there is a definite cognitive break between that class of rectangles with ration 5:1 or less, and that class of rectangles with ratio greater than 5:1. Rectangles from the first class are seen *as rectangles* with a specific proportion. Rectangles from the second class are seen merely as "long thin things".

This result suggests that there may be a clear cognitive distinction between rectangles (and hence, perhaps, corridors) which have a ratio of less than 5:1, and those which have a ratio greater than 5:1. According to this distinction, a corridor 10 feet wide would have an upper limit on its length of 50 feet.

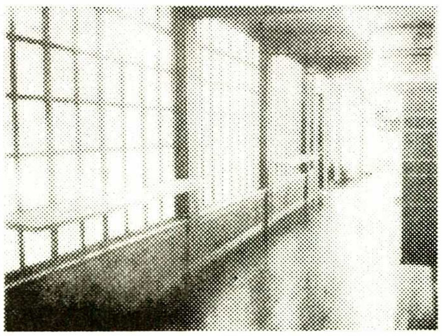
Another suggestive piece of evidence is the following: It is known that when a person sees 4 or 5 regularly spaced objects of the same kind, he perceives them as a *unit.* He can judge their number without counting them. When the number of objects goes above 5 or 6, he no longer sees them as forming a unit. He now sees them as a *collection.* If he wants to estimate their number, he has to count them, one by one, in sequence. At this stage, it seems likely that the feeling of monotony and repetition sets in. In its most extreme form, we may say that the perceiver, faced with a "collection," sees the objects as digits. If the objects were offices along a corridor, then the perceiver would begin to see the offices, and their inhabitants, as digits. (*G. Miller, "The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information", in D. Beardslee, and M. Wertheimer (Eds.), Readings in Perception, New York: Van Nostrand, 1958, esp. p. 104;* also *E. L. Kaufman, M. W. Lord, T. W. Reese and J. Volkmann, "The Discrimination of Visual Number", American Journal of Psychology, 62, 1949, pp. 498-525.*)

This result suggests that there may be a cognitive distinction between corridors which have five or less equally spaced doors, and those which have more than five.

(As it happens, both of these breakpoints coincide approximately: Given standard corridor widths, and standard office sizes, they both make a distinction between corridors less than 40-50 feet long and those more than 40-50 feet long.) Since common sense indicates that a corridor becomes unpleasant when it has five or more equally spaced doors down one side, and when it is more than five times as long as its width, it is very likely that this breakpoint is the one we are looking for.

Context

Any building with rooms opening off corridors; especially double loaded corridors. (Ron Walkey has pointed out that corridors can be longer than fifty feet provided there is changing visual stimulus on at least one side; for example a single loaded corridor where the unloaded side is full of windows looking onto something interesting.)



By: Christopher Alexander, Sara Ishikawa, Murray Silverstein.

July 1968 revised September 1970

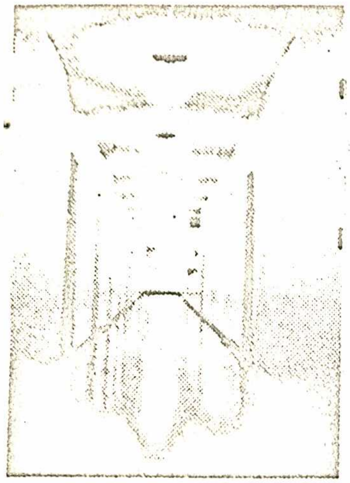
CIRCULATION REALMS

(SEE ENTRANCE)

TERRITORIAL AMBIGUITY

(SEE PEDESTRIAN PATHS)

Caindon Which Line



Corridors Which Live

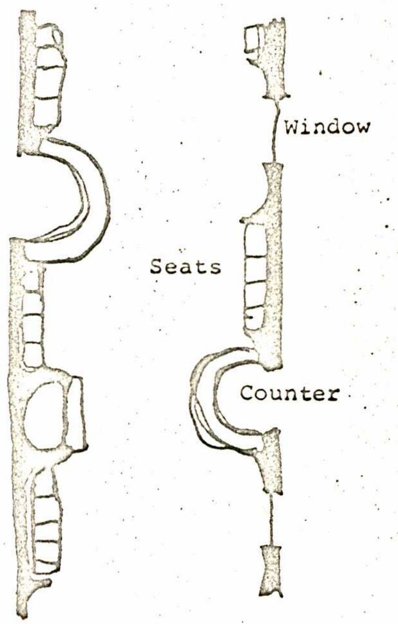
Corridors in modern public buildings are unfriendly and sterile places. They are designed for scuttling people through, not for people to stay in.

If a building is organized so that you feel as though you have to have an excuse to be in every part of it, it makes it impossible for anyone to get a sense of what the building is all about, and it gives a general feeling of being unfriendly.

While the rooms in a building are purposeful, the corridors and lobby do not have to be. It is true that they are mainly for circulation, but it is important that they be something more than just for moving through. It is from the circulation system of any environment that one gets a total sense of that environment. If the circulation system invites you to stop and be there for a while and see what is going on around you, the whole environment seems friendly. For instance streets with people sitting on stoops, and stopping to look in shop windows or to buy something from a street vendor, are alive and wonderful places to be, while a street with only blank walls, where people pass through intent only on their destinations, are frightening and alienating.

So it is with corridors in public buildings. Like the street, these corridors should have many places to stop, to sit, to look at things, to buy things and should give you a sense of what is going on around you.

(continued over)



Therefore: Line the corridors with windows looking into the services; make places by concentrating seats and activities along the way; project counters and entrances of services into the corridors. Make the main part of the corridor about 12 feet wide, and between 12 and 16 feet high, and where activities and counters are placed — make edges about 7 feet high, going to a total width of 21 feet. Give the corridor as many windows as possible, and make other corridors lead into it wherever possible.

Corridors Which Live

P n (continued)
C the need for these qualities, what do they mean for the form of such a corridor?

1. Rooms next to the corridor should have windows opening onto the corridor. We know it is unpleasant to walk down a corridor lined with blank walls. Not only do you lose the sense of where you are but you get the feeling that all the life in the building is on the other side of the walls, and you feel cut off from it.

We guess that this contact with the public is not objectionable for the workers, so long as it is not too extreme; i.e., as long as the workplace is protected either by distance or by a partial wall. People do not want to be exposed to the public if the exposure is so direct that it makes them feel self-conscious, or as though they have to keep their desks very tidy, etc. Frank Duffy cited these concerns as being the major ones in an office setting which is too open (*"Role and Status in the Office", AA Quarterly, October, 1969, page 10*). The balance between openness and protection can be achieved by providing windows into the services which begin at above desk level, and which are placed so that workers ar right next to the glass.

2. The corridor should be lined with seats and places to stop, such as newspaper, magazine and candy stands, bulletin boards, exhibits, and displays, etc.

Since most buildings cannot literally be lined with these kinds of things, it is best if they are concentrated to make places, in order for their impact to be felt.

3. Where there are entrances and counters of offices and services off the corridor, they should project into the corridor. Like activities, entrances and counters make places in the corridor, and should be combined with seats and other places to stop. In most public service buildings these counters and entrances are usually set back from corridors which makes them not only hard to see, but they give the feeling of being in the office, emphasizing the difference between corridor, as being only for passing through, and offices as being where things happen. These problems can be solved if the entrances and counters projected into the corridor and became part of it.

4. The corridor needs to be wide enough for people to feel comfc walking or stopping along th y. Informal experiments help to determine how much space people need when they pass others. Since the likelihood of three people passing three people is not high, we consider as a maximum two people passing two people, or three people passing one person. Each person takes about two feet; there needs to be about one foot between two groups which pass, so that they don't feel crowded, and people usually walk at least one foot away from the wall. The corridor width, therefore should be at least 11 feet.

Our informal experiments indicate that a person seated or standing feels uncomfortable if anyone passes closer than 5 feet. Thus, in places in the corridor where seats, activities, entrances, and counters are placed, the corridor should widen to about 16 feet (one sided) or 21 feet (two sided).

5. Ceiling heights should also feel comfortable for you whether you are walking or standing in the corridor.

According to the pattern, *Ceiling Heights*, the height of any space should be equal to the appropriate horizontal social distances between people for the given situation—the higher the ceiling, the more distant people seem from each other.

Edward T. Hall, in *The Hidden Dimension*, suggests that a comfortable distance to be away from strangers is the distance at which you cannot distinguish their facial features. He gives this distance as being between 12 and 16 feet. Thus, the ceiling height in a corridor should be roughly in that range.

Where people sit and stand talking to each other, the appropriate social distance is more intimate. Hall calls casual conversation distance Social Distance-Far Phase, and gives it a dimension of 4 to 7 feet. Thus, the ceiling height in activity and "edge" places should be 7 feet.

6. Long corridors should be avoided at all costs. This is discussed in the pattern, *Short Corridors*. The feeling of corridors being long, institutional, and unpleasant is diminished by windows to the outside, activities, as discussed above, other corridors leading into it, and the use of natural light as opposed to artificial light.

Context
This pattern applies to major corridors where public visits are frequent.

By: Barbara Schreiner.

October 1970

This pattern is tentative. If you have any evid[illegible] support or refute its current formulation, please send it to the Center for

CHAPTER EIGHT: DIAGNOSIS

In this chapter we present a rough draft of the diagnosis for the University of Oregon, in 1971. This preliminary diagnosis still needs a good deal more work, and discussion with university representatives. It is presented here, mainly to illustrate the form of the final diagnosis, and not its detailed content. Some questions, in particular, will require a great deal of further study before any final diagnosis can be made - this is indicated clearly in the text.

The diagnosis, like the patterns in the previous chapter, is presented under nineteen categories, corresponding to the nineteen major place-types. Within each category, we examine those places which are now part of the university, evaluate these places from the point of view of the patterns which they must satisfy, and recommend tentative policies which will be needed to repair the deficiencies.

Draft

SUMMARY OF DIAGNOSIS

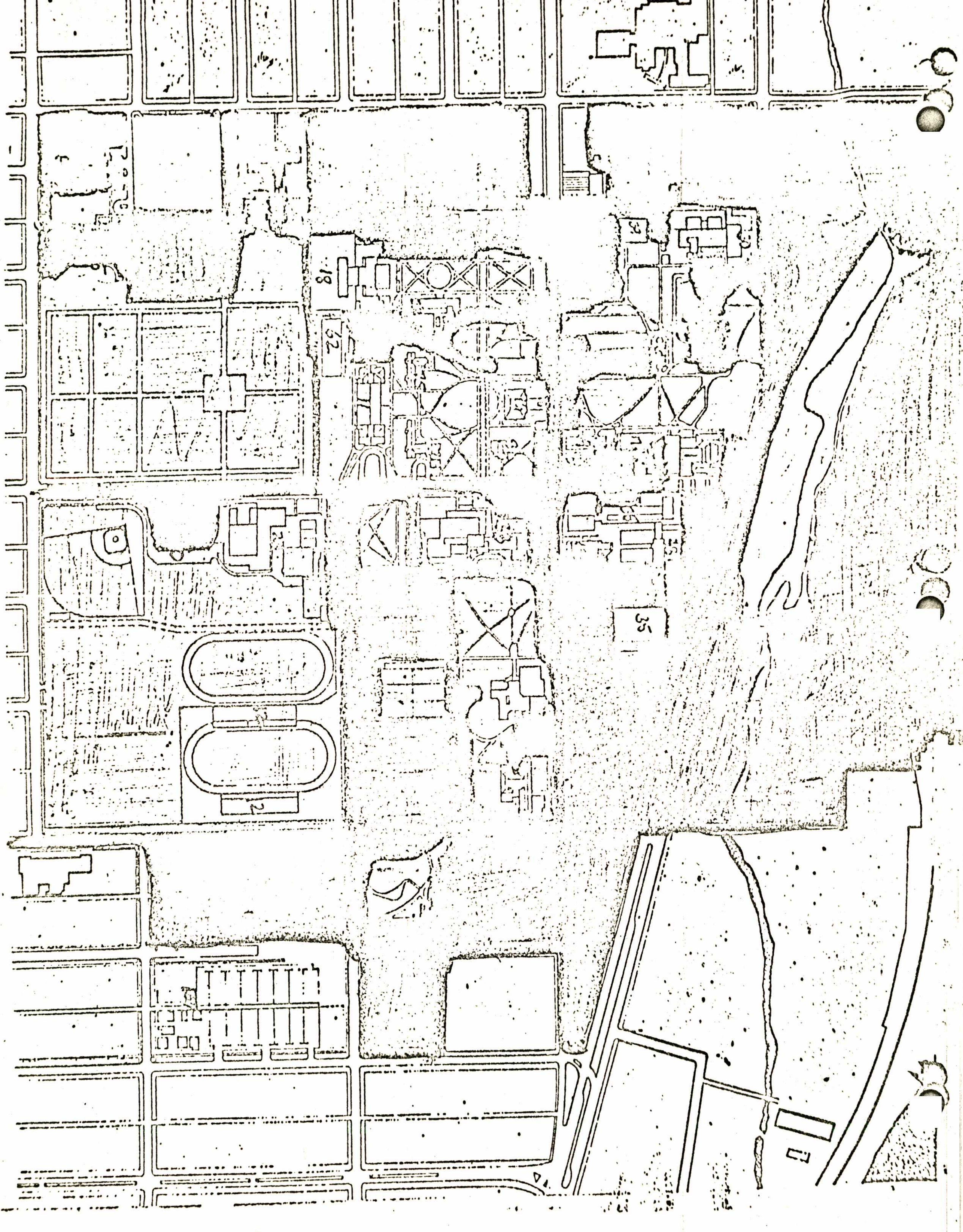
The following map summarises our current diagnosis for 1971, and our recommendations for repair.

Areas marked yellow are now in balanced use, and except for very minor changes, must be left untouched by future development.

Areas marked orange are out of balance - but to a limited extent. These areas must be modified to bring them into balance - but they should be left with essentially the same use that they have now.

Areas marked red are very badly out of balance. These areas must be repaired to bring them into balance. However, they need so much repair, that they will, to all intents and purposes have to be rebuilt - and any one of them may be given an entirely new use.

Any newly built space added to repair space deficiencies, must be added in the areas marked red - it may not be added in the areas marked yellow or orange.


18
32
39
35
2

CAMPUS

The relevant patterns are University size, University area standards, Town integrated with university and University diameter.

University size

The University's Committee on the Future of the University has recommended that enrollment should be allowed to increase up to approximately 18,000-19,000 students, and be held constant at that point. This is consistent with the upper limit of 25,000 imposed by this pattern. However, recent growth has been too fast. Total enrollment has grown from 4700 in 1953 to 14,500 in 1969 - a mean growth rate of 7%/annum (calculated as a compound rate) compared with the 2%/annum suggested by the pattern. We propose:

Policy 1. Future enrollment increases should be held below 2% per year; planning should be based on an ultimate enrollment limitation of 19,000 FTE; however, building density should be established in such a manner that enrollment could be increased to approximately 25,000 if need be, by making additional land purchases within appropriate walking distances from the center of campus. The growth rate would impose the following limits:

1970	15,300
1971	15,600
1972	15,900
1973	16,200
1974	16,500
1975	16,800
1980	18,500
1985	19,000
1990	19,000

University area standards

This pattern does not yet exist. When it does, it will take the form, Land = f(N) in acres, where N is student enrollment. Our analyses lead us to suspect that the University of Oregon has too little land now, and will have an even bigger deficiency in the next few years, as enrollment grows. According to the pattern we expect a table like this:

Policy 2. To keep the total land owned by the university in line with the growing student population, land should be acquired in the following amounts:

Year	Projected Population	Land Needed	Owned Today (1971)	To be acquired by this date
1970	15,300			
1975	16,800			
1980	18,500			
1985	20,000			
1990	20,000			

University diameter

The land now owned by the university is shown shaded on the accompanying map. The diameter of this land, measured from NW to SW, is 4900 feet; measured from NW to SE it is 6300 feet. This already violates the outer diameter of 5000 feet. As far as the inner diameter is concerned, the most widely separated classrooms are in Music and Physical Sciences, which are approximately 3000 feet apart.

If we look at the disposition of existing campus buildings and the opportunities for further campus development we find the following:

a. Franklin Boulevard and the Millrace are a constraint upon further classroom development to the north;

b. Northwest Christian College and Sacred Heart Hospital are a constraint upon campus development to the northwest;

c. The cemetery and the Physical Education - Athletic complex are a constraint upon the further development of classrooms toward the southeast;

This leaves three major areas for future classroom development adjacent to the existing classroom areas. These are:

d. The "Southwest Quadrant", that is, that area bounded on the north by the central library; on the east by the cemetery; on the south by 18th Street and on the west by Alder Street - this area is now within University ownership.

e. The area directly west of campus; this area is directly adjacent to the University library and represents a natural area for future University expansion; many of the fraternities and sororities in this area have been up for sale and provide an unusual opportunity for the acquisition of both land and buildings that are extremely well-suited to university purposes.

f. The area east of the Student Union; this is basically the existing dormitory area. Although this area is already pretty well built up, there are some opportunities for classroom construction which could serve to create integrated living-learning centers; there is also an opportunity to convert underused dormitory space to academic uses as in the current proposal to convert Straub Hall for the Psychology Department.

In view of the foregoing, we propose the following:

Policy 3. The area for future classroom development should extend from Franklin Boulevard on the north to approximately 18th Street on the south and from the middle of the block between Alder and Hilyard Streets on the west to Carson Hall on the east. This places the center of the classroom area in the middle of the area bounded by Johnson Hall, Susan Campbell and Hendricks. This should become the geographic center of future campus development. Future development of the campus should maintain all classroom facilities within 1,500 feet of the center of campus. All other University facilities (except student housing) should be within 2,500 feet of the center of campus.

Town integrated with university

The commercial and public life of Eugene touches the campus at two spots only: at Kincaid and 13th, and at Agate and Franklin. In neither place is the town "integrated" with the University. In order to provide for this integration, the future campus should not have a 'hard' edge; it should blend into the surrounding community. Functionally, there is no necessity for all University land to be contiguous and there are substantial advantages to interspersing University facilities into the surrounding community wherever the two are compatible. This is possible, and likely to be rewarding at Kincaid and 13th. At Franklin, it is made almost impossible by University diameter.

We propose:

Policy 4. Land purchase policies should be revised to permit the acquisition of property outside the official campus boundary, subject only to the maximum distances referred to in the pattern University shape and diameter.

We propose also:

Policy 5. The first development of the university within the town should consist of the acquisition of fraternities and sororities which may become available directly west of the university in the vicinity of the main library. We propose also that the piece of land now known as the Kincaid parking lot be used for building, and that its parking be relocated within the building complex. We suggest also that the university seek to cooperate as far as possible, with those citizen groups now comtemplating urban renewal west of Kincaid.

Policy 6. The waterfront area, between Franklin and the river, should be developed as soon as possible as a productive part of the university, in a manner compatible with the riverfront ecology.

In order to make the university land functionally continuous, and in order to enhance the great natural beauty of the Millrace, and in order to take the greatest advantage of the potential beauty of the waterfront, we consider it essential to bridge the barriers now created by Franklin Boulevard and by the Southern Pacific railroad tracks.

Of the many proposals concerning the Franklin Boulevard, the railroad, and the proposed freeways, the following seems most desirable to us, and we propose that the university actively pursue this course:

Policy 7. In order to create continuity of university land between the present campus area, the Millrace, and the riverfront, and to protect the Millrace and the riverfront, a new arterial road, large enough to replace Franklin Boulevard, should be built on the present Southern Pacific right of way, either directly north or south of the railroad tracks. This arterial road should be sunken, to reduce the effects of noise, and bridged by very wide tunnels which connect the Millrace area with the riverfront, in at least two points. Land now occupied by Franklin Boulevard should be given to the university.

Cpl.

DEPARTMENTS

The relevant patterns are Department size, Department space standards, Fabric of departments, Department hearth.

Department size

All departments with a student enrollment larger than 400 are violating the pattern Department size. At the present the following departments have enrollments of 400 or more (Fall term 1970). (Enrollment is defined as student-credit-hours/15.)

Biology	506
Business Administration	715
Education - Curriculum & Instruction	780
English	1004
History	550
Political Science	704
Psychology	806
Sociology	688
Romance Languages	412

Recognizing that the 'optimum' size for any university department is bound to vary from discipline to discipline and will depend on a number of factors such as the nature of the discipline, the mix between graduate and undergraduate students, teaching loads generated by other majors, aspirations and goals of the department, etc., we propose:

Policy 8. Each of these departments should be asked to review this question for itself and to find a way of splitting into new departments, each with its own budget and degree program. Any department which proposes to maintain an enrollment in excess of 400 FTE students should be asked to indicate the special reasons which require that the department be that large, and to look for ways and means of providing better departmental reorganization.

Department space standards

The following departments have space deficiencies of 25% or more:

(This list is highly tentative - calculations are in progress.)

Geology
Physics
Psychology
Music
Anthropology
Speech
Curriculum and Instruction
Education Counseling

Policy 9. All departments in the foregoing list should be given new space as soon as possible, in the amounts shown.

We suspect that the following departments have surpluses which are 25% or more of their total, and at least 1000 sq. ft. (This list is highly tentative - calculations are in progress.)

Graduate School
Chemistry
Sociology
Special Education
Journalism
Molecular Biology
CASEA
Bureau of Government Research
Registrar
University Placement

Policy 10. In so far as these surpluses are as stated, the surplus space should be reassigned according to the following priorities:

a. Establishment of departmental hearth.
b. Establishment of student lounges, locker space, study carrels, etc.
c. Establishment of departmental libraries.
d. Student work stations.
e. Reallocation to other departments with space deficiencies.

Fabric of departments

The following departments have their offices too widely scattered:

Psychology	Building	4	12,401	38.2%		
		114	2,893	8.9%	2000 ft.	
		117	799	2.4%	2000 ft.	
		87	9,369	28.8%	2900 ft.	
		119	338	1.0%	2000 ft.	
		120	667	.6%	2000 ft.	
		517	3,107	9.5%	2900 ft.	
		518	664	2.1%	3300 ft.	
		536	1,719	5.3%	3300 ft.	
			32,516			
Computing Center	Building	39*	6,455	71.6%		
		30	1,485	17.6%	60 ft.	o.k.
		8	499	5.9%	600 ft.	
Bus. Admin.	Building	3*	12,464	88.0%		
		18	1,688	12.0%	800 ft.	
German-Russian	Building	9*	2,551	87 %		
		18	216	13 %	2400 ft.	
Romance Languages	Building	9*	5,698	90 %		
		517	636	10%	2400 ft.	
Education (Gen.)	Building	7*	20,419	78.4%		
		518	3,056	11.7%	2700 ft.	
		18	810	3.1%	300 ft.	o.k.
		517	925	3.6%	2700 ft.	
		?	830			
Mathematics		5*	7,111	63.8%		
		8	2,200	19.7%	1300 ft.	
		9	1,699	14.8%	400 ft.	o.k.
		18	216	9.4%	1350 ft.	
Music		25*	22,118	95 %		
		533	864	3 %		o.k.
		18	486	3 %	800 ft.	
Anthropology		3*	5,420	60.5%		
		8	297	3.3%	600 ft.	
		123	875	10.0%	2000 ft.	
		517	636	7.1%	2600 ft.	
		?	1,712			

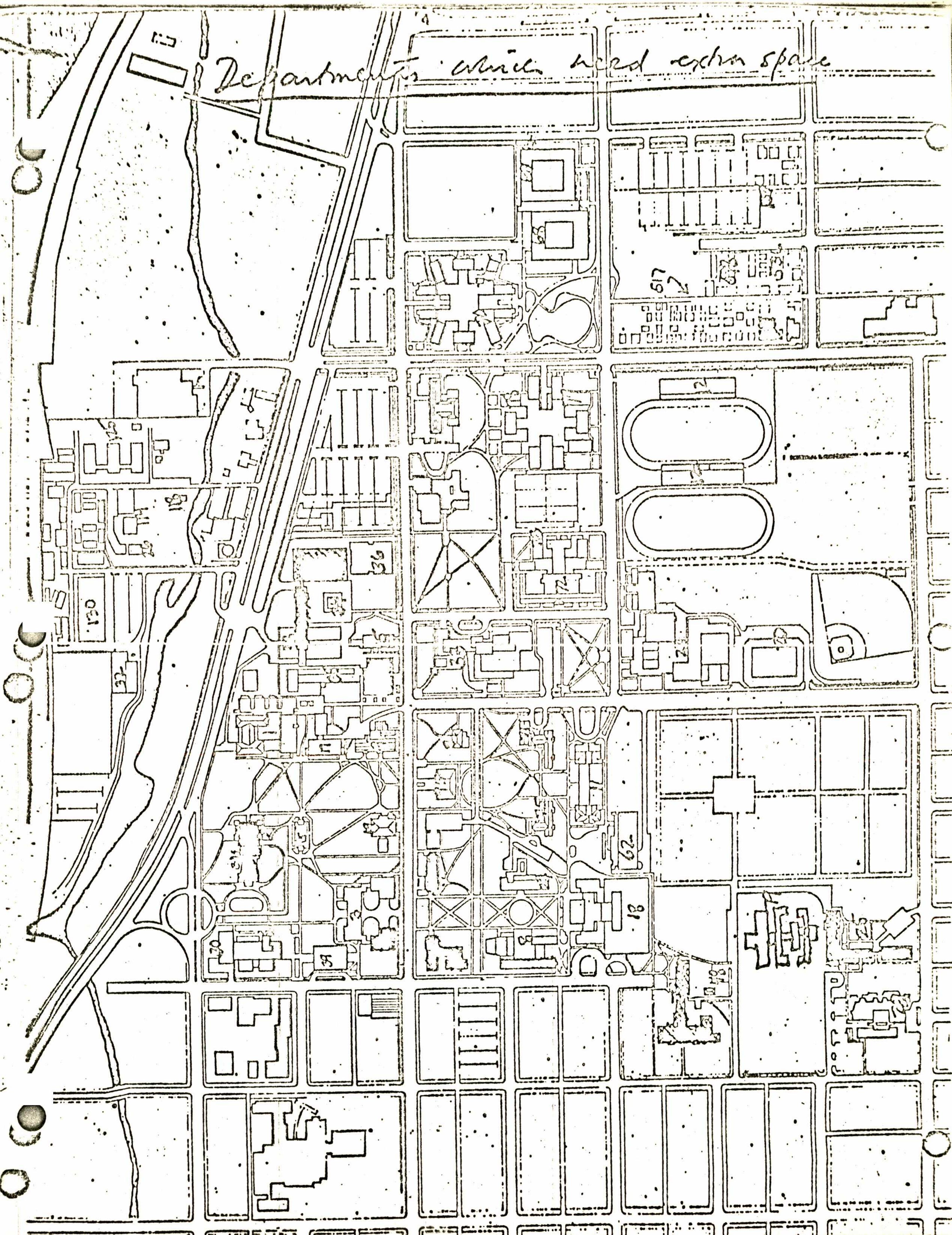
11 Policy 11. All the above departments should have space re-assigned so as to bring all parts within 500 feet of the department hearth.

Department hearth

With the exception of the Law School, none of the departments have adequate department hearths. Since department hearths are very important, we recommend that the Legislature explicitly recognize the crucial academic importance of these department hearths, and that they and the State Board adopt the following policy, which permits the construction of the hearths as a necessary and legitimate budgetary item.

12 Policy 12. Department hearths with an area of 20N square feet, where N is the number of faculty, should be recognized by the State Board as necessary budgetary items, requiring the use of general funds, and a university-wide effort should be made to create such hearths for all departments.

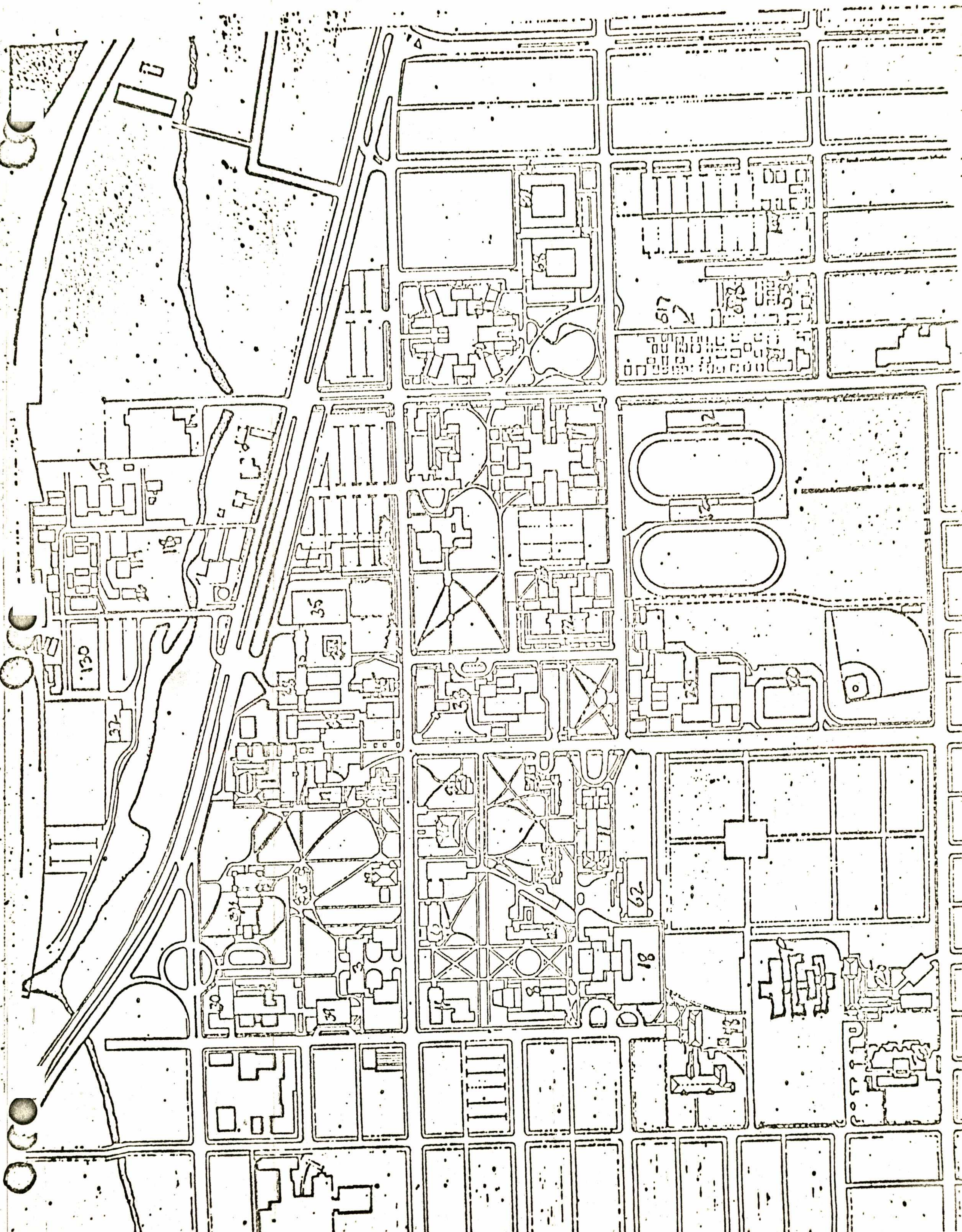
Departments which need extra space



ADMINISTRATION

It is clearly recognised that Emerald Hall provides entirely inadequate facilities for the University's administrative services, and that there is an urgent need for new facilities. The design for the new Administrative Services building was, however, complete before the start of this master plan. There has therefore been no opportunity for the criteria developed in the master plan to influence its location or design, and, as currently designed, it does not conform to these criteria.

To illustrate the potential effect of our master plan on a typical project, we intend to show a design for the Administrative Services building which does reflect the principles of this master plan, as one of our example projects in Chapter 9.



130
35
62
18
37

STUDENT HOUSING

The relevant patterns are Students close to campus, Private access in communal living, Student household mix, Living woven into learning, Student community size.

Student housing close to campus

As this pattern tells us, the academic success of the University depends on the fact that students are able to live near the center of the university. However, as the student population has grown, during the last twenty years, the average distance between student housing and the center of the campus has been growing steadily. This is shown in the following table:

	1940	1950	1960	1970
1500				
1500 - 2500				
2500 - 5000				
7500				

This increase in distance has been aggravated by the deterioration of living conditions on campus, which has left dorms vacant, land speculation near the campus, and the policy of locating married student housing far from campus. It is essential, therefore, that the university should make sure in some manner, that the distribution of student housing is brought back within the limits imposed by the pattern.

Let us now compare the present distribution with the desired distribution. (These figures are guesses, not yet checked.) Present distribution is:

	Present Distribution	Desired Distribution
Within 1500 feet of the center:	c. 2000	3000
Between 1500 and 2500 feet of the center:	c. 2000	4000
Between 2500 and 5000 feet:	c. 4000	7000
Beyond 5000 feet:	c. 7000	-0-

We therefore recommend:

Policy 13. The number of student dwellings within 1500 feet of the campus center should be increased by 1000; the number of student dwellings between 1500 and 2500 feet of the campus center should be increased by 2000; the number of student dwellings between 2500 and 5000 feet of the campus center should be increased by 3000.

This policy will require construction of new housing on campus, and will also require cooperation with the city, to help create more student apartments close to campus. Since the existing dwellings on campus - the dorms - have had a growing vacancy rate, and since there has been widespread student dissatisfaction with these dorms, we must now discuss the implementation of this policy in more detail. It hinges on two patterns, both widely violated today: Student housing mix, and Private access to individual dwellings.

Student household mix

There is, at present, a sharp distinction between university housing for single students, and university housing for married students. Married student housing is located some distance from campus (Amazon and Westmoreland). All housing now on campus is for single students.

This clearly violates the pattern, which requires that student households of different kinds be mixed.

We shall recommend below (Policy 17) that all student housing should be taken out of the hands of the university, and that it should be modified, as far as possible, to provide apartments for students which are free from parietal rules. In line with this recommendation, we now recommend:

Policy 14. There should be no distinction made between housing for married students, and for single students. All student housing should be treated as generalised housing, suitable for both married and single students, or for any mixed distribution of the two kinds of household.

In particular, also:

Policy 15. Housing which provides apartments for married students should be provided on campus in the amounts indicated in any of the areas indicated on the attached map. In particular the areas near the River front, east of Agate Street, south of 18th Ave., and west of Alder Street are suited for such facilities; also, the west edge of Agate Street, the north edge of 18th Ave., and the east edge of Alder Street would be suitable locations; certain dormitories could also be converted to apartment use if sufficient parking were available close by. (Bean Hall is an obvious candidate for this latter case.)

Private access to individual dwellings

This pattern makes it clear that one of the major reasons why student dorms fail, is that they leave the individual inhabitants with the feeling that their places are not really "theirs", and that their access and way of life there are not under their own control. This problem is created, to a large extent, by the parietal rules which apply to the dorms.

We believe that it is impossible to resolve the difficulty of on-campus housing, so long as housing is owned by the university. In order to resolve this problem we recommend:

Policy 16. The University might consider gradually leasing existing student dorms to one or more student cooperatives or some other form of private management.

and

Policy 17. The university should in the future adopt the practice of leasing land to student cooperatives, or developers, who agree to provide low cost housing to the students, and it will play whatever role is necessary to facilitate the operation of these cooperatives, but will not itself play any further role as a housing landlord.

The physical expression of this pattern required that each individual dwelling have its own private access from the street. This type of privacy does not exist in any of the dormitories on the campus. It is therefore not possible to entertain friends late at night or to have friends stay overnight. The student does not have control over his living space. We therefore recommend:

Policy 18. Wherever feasible, dorms should be converted so that they become apartment houses but retain certain communal facilities.

Policy 19. The University should stipulate that cooperatives and/or private developers who build student and/or faculty housing on university land must adhere to all adopted university development patterns.

The number of off campus housing units available, at reasonable prices, within a one mile radius of the university is also too small. Many of the rents are so high, that students are forced to move further out. This cannot be corrected by any direct university action on university-owned land. It also seems impractical to suggest that the university should try to buy this land in order to lease it to cooperatives and developers.

We have not yet discussed the most feasible ways of solving this problem.

However, tentatively, we propose:

Policy 20. The university should try to negotiate with the city to improve student housing within a one mile radius of the campus, either by means of rent control, or zoning changes, or urban renewal programs.

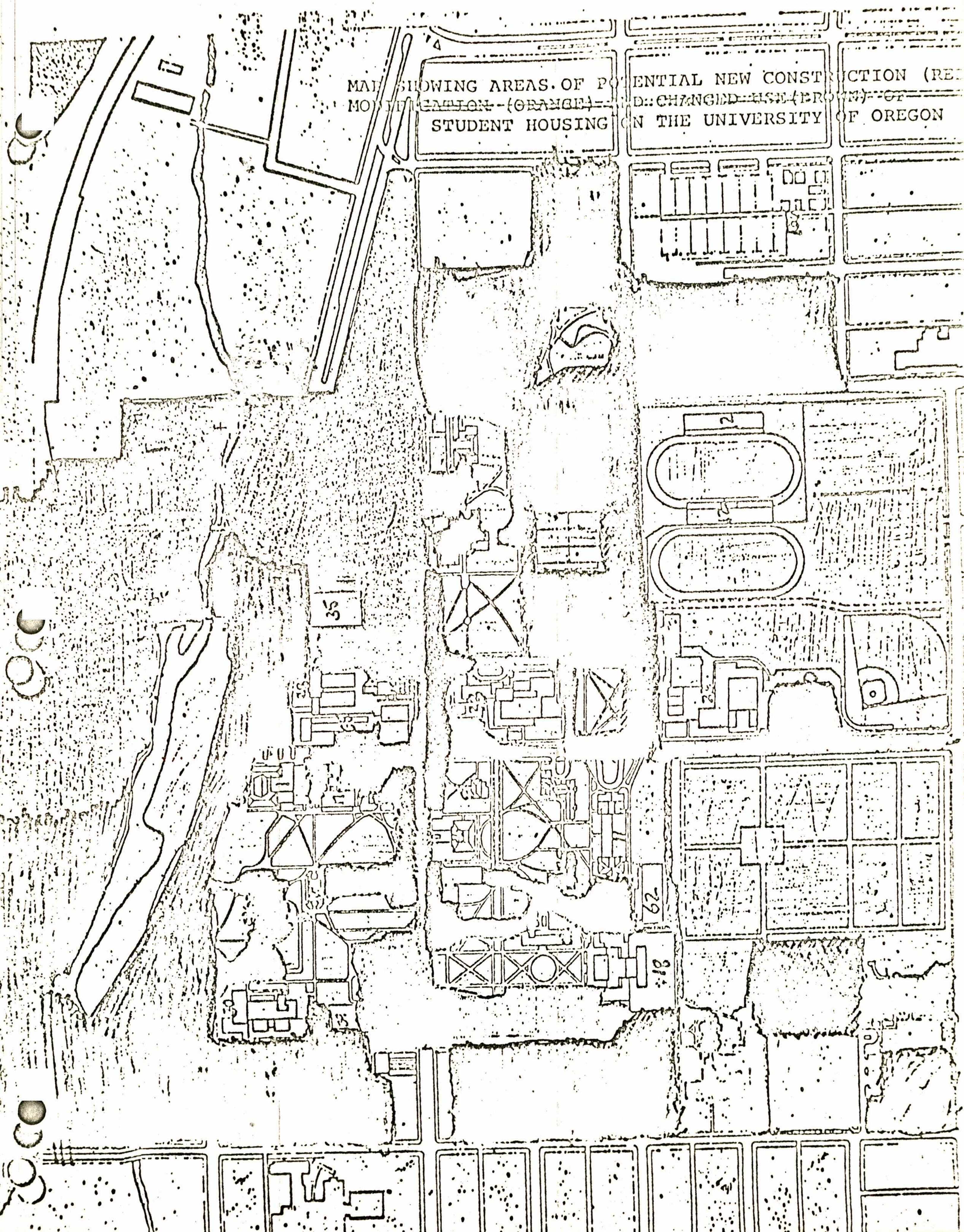
Living woven into learning

The current situation on campus completely fails to meet this pattern. An unfortunate separation has occurred between student housing on campus and academic functions. The dormitories have been moved to the eastern side of campus, encompassing the academic core. This has prevented the integration of living and studying with the activity of taking classes, and has placed dormitory inhabitants in the position of pedestrian commuters. For living quarters to become part of academic life, they must be interwoven into academic facilities. This can only be achieved in the present situation by converting existing dormitories partially to classes and offices, by converting academic buildings to dormitories, by constructing housing amidst academic buildings, and by constructing academic buildings amidst the dormitories.

Policy 21. Certain wings of Walton, Hamilton and Bean dorms should be converted to academic use. When possible, Friendly, Hendricks, and Susan Campbell should be converted back to housing, and additional student housing should be constructed along 13th Street, between Chapman Hall and the Women's Gym, behind the Student Union, and in other areas shown on the attached map. As stated above, this housing should not be built by the University itself.

Student community size

Carson Hall has ______ students sharing dining, lounge and entrances. Bean Hall has ______. Earl has ______. Walton has ______. Hamilton has ______. To function as communities, sections of these dorms must be made independent of each other by dividing up communal spaces between smaller groups, or by separating wings of the dorms by offices and classrooms.


MAP SHOWING AREAS OF POTENTIAL NEW CONSTRUCTION (RE
MODIFICATION (ORANGE) AND CHANGED USE (BROWN) OF
STUDENT HOUSING ON THE UNIVERSITY OF OREGON
2
35
62
18

PUBLIC BUILDINGS

The relevant patterns are University as marketplace, Human scale in public buildings, Buildings shaped for light, Horizontal office buildings, Principles of fire safety, Feeling of shelter, and Social spaces define structure.

University as marketplace.

This pattern is widely violated, all over campus. The buildings which violate it most clearly are Prince Lucien Campbell Hall, Science II, and the Athletics complex, since these buildings are not only large, but also have most of their circulation internal, and hidden from the public domain. The buildings which come closest to meeting the pattern are the student dormitories (especially Walton and Hamilton), and older buildings (Susan Campbell, Hendricks, the Women's Gym, Friendly, and the Student Union).

It is possible to meet this pattern, in existing buildings, by modifying paths through the buildings to make them more open, and more public; and to increase the direct access from various sections of the building to the outside.

Policy 22. The University should strive to modify the following existing buildings to conform to this pattern, by increasing the number of entrances, opening the ground floor circulation, and increasing the number of stairs. (See list and map.)

The following policy will help to make sure that new buildings meet this pattern:

Policy 23. The present campus has many large open places. We propose that all future buildings on campus should be built to form a system of narrow pedestrian streets, each street having low 2 and 3 storey buildings along its sides, with frequent access to upper storeys by direct stairs: and these pedestrian streets shall be placed in such a way that they themselves enclose larger open spaces. Pedestrian streets of this kind seem possible in the locations shown on the accompanying map.

Finally, in order to be sure that people are able to have pride of possession of their buildings, as required by the pattern, we suggest that the university does everything possible to enable people to control their own immediate environments.

Policy 24. As a start in this direction, we propose that the university conduct an experiment, in two or three selected buildings (perhaps Music school, Science II and houses rented to students), where people are allowed, and encouraged to paint walls, make minor modifications move partitions and build furniture for themselves, with the help of the Physical Plant, provided that these modifications all conform to code requirements, that the people who take part also take full responsibility for good workmanship and care, and that they sign waivers, releasing the university from liabilities in case of accidents.

If, after a year or two of operation, these experiments have proved successful, we would then go on to propose a more general policy, which would encourage this kind of activity on a campus wide basis.

Human Scale in public buildings

Buildings shaped for light

Horizontal office buildings

Principles of fire safety

In general, the older buildings on campus meet these patterns successfully, and the newer buildings violate them. The Education building, Friendly, Susan Campbell, Hendricks, Gerlinger, the Student Union, Emerald Hall, the Music School meet these patterns. Prince Lucien Campbell, Science II, the East Wing of Science, obviously violate them. Walton, Hamilton, Earl, Bean also violate them. Even the so-called "more successful" modern buildings - the Law School, the Health building, the Architecture Extension, violate these patterns to some considerable extent: they are alienating, not inviting. The currently proposed Behavioral Science complex, Student Union addition, Administration Building, and Science III, also violate these principles.

Policy 25. Wherever feasible, Science II, Science III, the East Wing of Science, and Prince Lucien Campbell should be softened by building arcades, covered walks and terraces or even other smaller buildings in front of them, and by planting large trees, thus partially obscuring the facades and reducing their scale to more human proportions.

As far as new buildings are concerned:

Policy 26. All new buildings should be three storeys or less, never more than 9000 square feet total under one roof (3000 sq. ft. per floor, for a three storey building) with direct access to all upper floor space directly from the street.

It is to be understood that these buildings will be built to connect with one another, via arcades and corridors, thus forming a continuous connected fabric of buildings.

Feeling of shelter

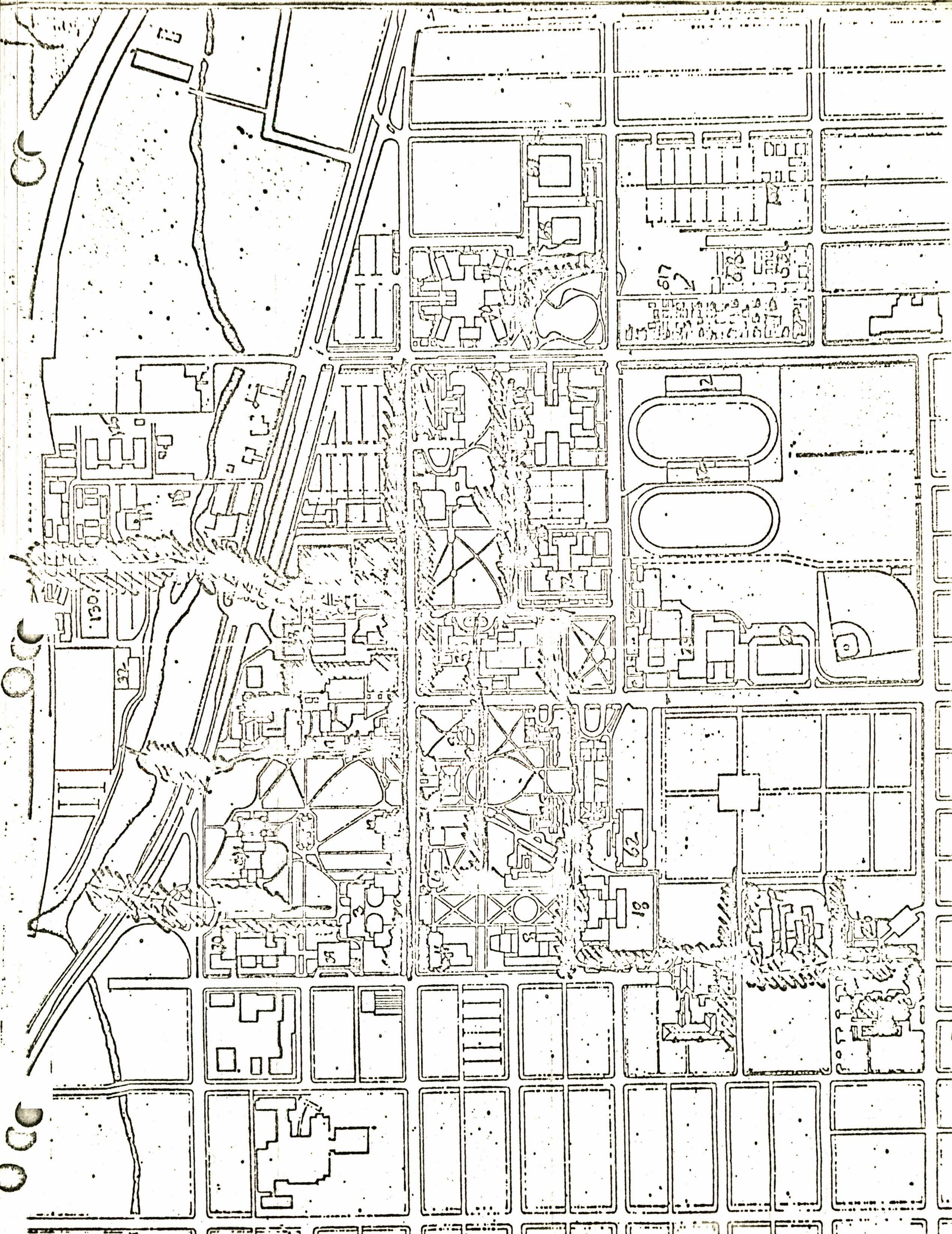
Social spaces define structure

In these respects also, the older buildings are more adequate than the new buildings. The older ones - Deady, Susan Campbell, etc., are wood-frame, and brick buildings, with visible roofs. The structure consists of human, modifiable, and manipulable materials, which adapt to change, and which reflect, accurately, the social spaces which they encase.

The new buildings - Science II, Lucien Campbell, are made in such a way that the structure is unrelated to social spaces, the materials neither invite, nor allow modification, and the buildings, being high and flat roofed, provide no feeling of shelter.

It is obviously impossible to repair the buildings which violate the patterns. However, in order to maintain the human quality which the campus was once famous for, we propose that future buildings should be somewhat more uniform in their construction, materials, and finishes. In particular, we recommend:

Policy 27. New buildings should be built with visible roofs, in wood or brick primarily; structural systems should define rather than interrupt social spaces; detailing should permit future modification of the building without heavy demolition; interior surfaces should be finished with materials which may be modified by users (repainting, hanging pictures, bookshelves, etc.) without serious damage.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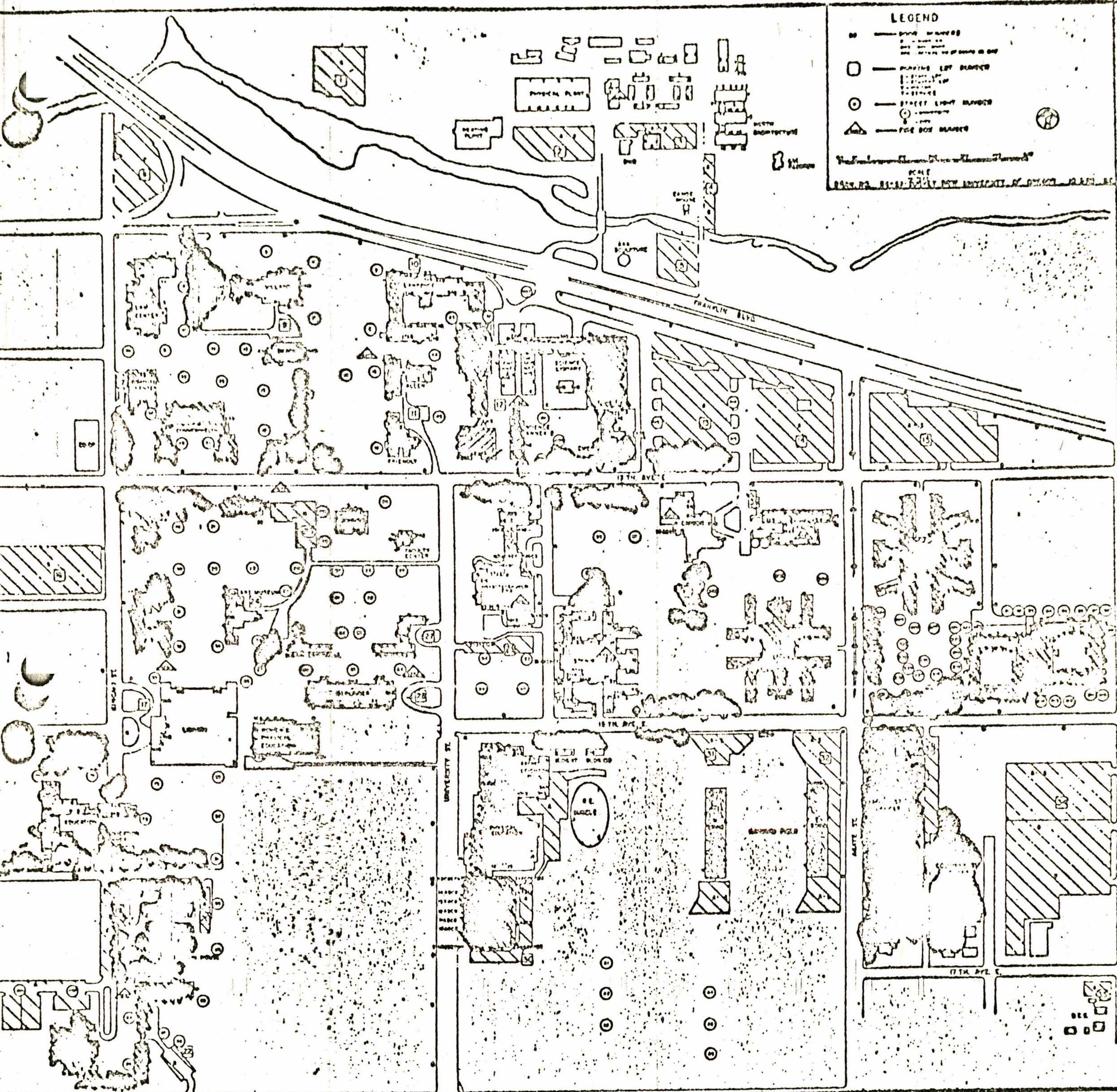


LEAVE
MODIFY
ADD
SUBTRACT

OUTDOOR PLACES

The relevant patterns are Convex connected open space, Access to a green, Ratio of built to open space, Useable outside edge of buildings, and South facing open space.

Convex connected open space

Many of the outdoor places on campus are beautiful, and satisfy this pattern perfectly - see all those marked in yellow on the map.

There are a number, however, which are not quite enclosed enough. To make them work properly they need extra enclosure, around at least some part of their edge. These spaces are shown in orange on the map, with a red edge, to show that the edge of the space needs to be replaced by trees, barriers or buildings.

A few spaces are too enclosed, and need to be opened, to make them work. The center courts of Bean are one example - they need to be opened up, in order to make them work.

Policy 28. The following open spaces are beautiful now and should be preserved, essentially as they are now. They are colored yellow on the map.

1. The Cemetery
2. Education court
3. Glade between Music School and Cemetery
4. Area between Women's Gym, Gerlinger and Cemetery
5. Mall surrounded by Library, PLC, Condon, Chapman, and Museum
6. Area between Gerlinger, Susan Campbell and Hendricks
7. Area between Susan Campbell, Johnson, Faculty Club, and Hendricks.
8. Area between Commonwealth, Fenton, Deady and Computer Center
9. Area between Villard and 11th Street
10. Area along both shores of the Millrace
11. Mall surrounded by Fenton, Deady, Villard, Lawrence, Allen and Friendly

Policy 29. The following places are too open, and should be given further enclosure by construction of arcades, buildings, or landscaping at their edges. They are colored orange on the map:

1. Area between Music and Clinical Services needs partial enclosure on south side
2. Area south of Education needs row of trees along street
3. Area north of Education needs enclosure on east side
4. Area between Education, Library and Cemetery needs enclosure on south side
5. Area of Hudson house site needs enclosure on north and west sides
6. Area west of Commonwealth needs enclosure on south or west side
7. Area north of Faculty Club needs enclosure on north side
8. Area west of Post Office needs enclosure on north side
9. Area south of Student Union needs enclosure on south and east sides
10. Area between Carson and Student Union needs enclosure on north side and south of Carson
11. Area between Emerald, Science annex and Science plaza needs enclosure on north and south sides
12. Area between Bean and Hamilton needs enclosure on south and west sides
13. Sports area needs enclosure on south side
14. South west tennis courts need more enclosure
15. Area between the Art Museum, Chapman Hall, and Johnson Hall
16. Area between Hendricks Hall and Faculty Club

Policy 30. The following places are so enclosed that they are not used at all. To make them useful, they should be opened up to other larger open spaces. They are colored orange on the map:

1. Loading area between Science Main Block and Franklin Boulevard needs to open off Franklin
2. Courts in Bean Hall need to be opened to west and east
3. Courts in Walton Hall need to be connected by separating wings from each other

Policy 31. The following places are basically disfunctional; they are not working as places for outdoor entertainment, sitting, talking, sports or anything else. These places need to be redeveloped as outdoor spaces or as sites for future building.

1. Science plaza - between Science II, East Wing, and Main Science
2. Area east of SW tennis courts
3. Area west of Susan Campbell
4. Area between Villard and Law School
5. Triangle north of Villard
6. Waterfront property

7. Agate Street and Columbia Street office areas
8. Area north of Leighton Pool.

Access to a green

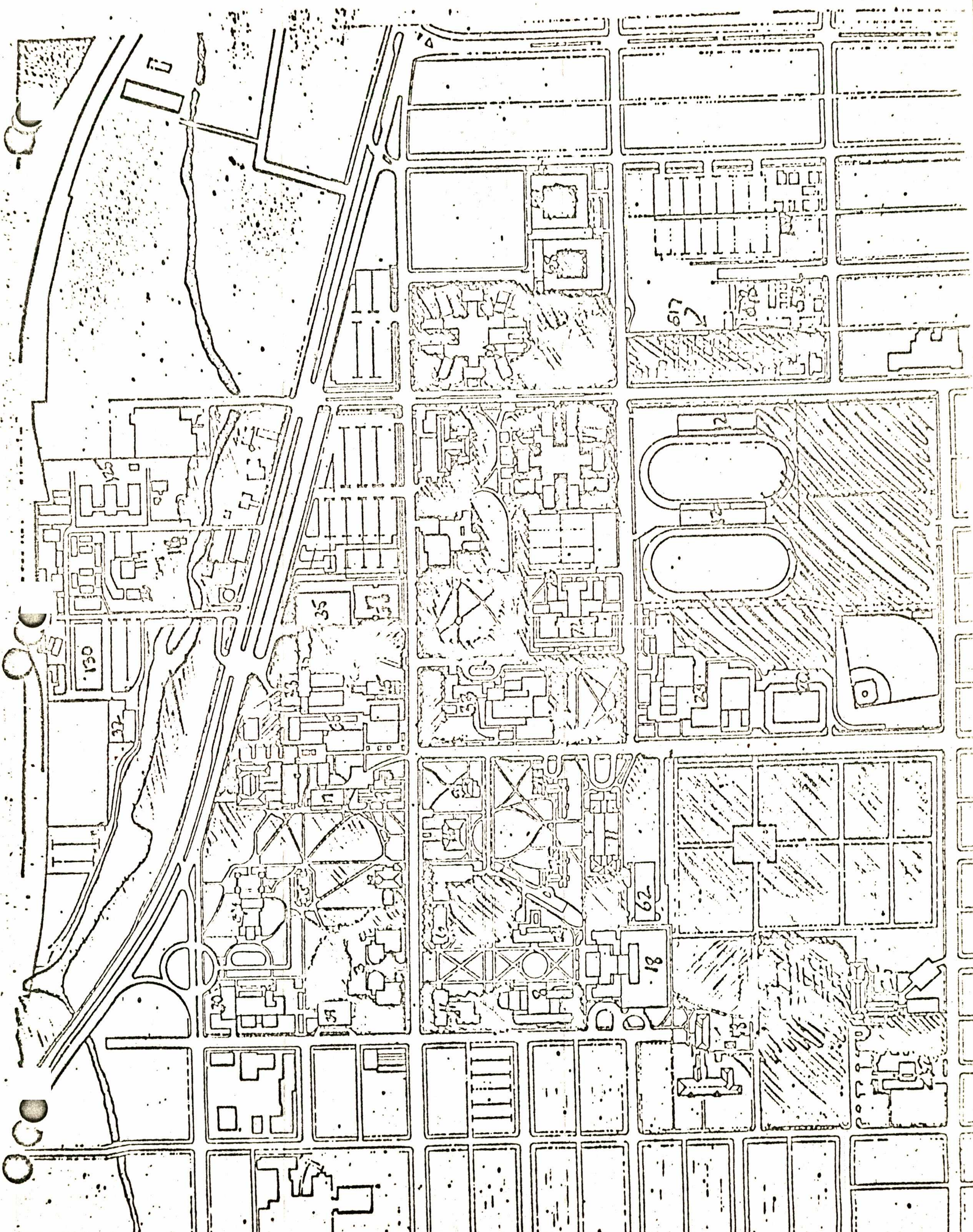
There are no places on campus which do not have close access to a sufficiently large green. However, in order to maintain this pattern at a satisfactory level, it is essential that none of the larger open spaces which now exist be built upon, except the place north of the Music School. Instead all buildings should be placed at the edge of these places, and between buildings on small left overs of the outdoor space.

Ratio of built to open space

The Science complex is too densely crowded - it needs more open space near it. All the other areas on campus are within reasonable density limits.

Useable edge of buildings

Almost none of the outdoor places on the campus satisfy this pattern. Exceptions are: the front lawn of the Student Union; the back garden of the Music School.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PARKING

The relevant patterns are Parking less than nine percent, Small parking lots, University parking, Cars surround pedestrian islands, and Parking garages surrounded.

The parking problem is complex. We do not yet have any completely satisfactory answers to it.

We can say that three objectives will play a major role:

1. It is imperative to restrict the total amount of land covered by parking, so that parking does not threaten the environment.
2. All users of parking will have to pay for it, whether they are given space in parking garages, or in lots.
3. Parking which is provided for commuters must be close, in time-distance, to the workplaces served.

There are a number of ways of meeting these objectives. They may require a ring of parking garages, at a 1600 feet radius from the center, supplemented by a number of very small tree shrouded lots. They may require a train connection between the campus and Autzen stadium, so that people can park cars in the stadium parking lot. It may turn out that we should restrict parking drastically, with the idea of putting pressure on the development of public transportation. A full diagnosis of the parking situation will be ready in the next few weeks.

ROADS

The relevant patterns are Major roads outside neighborhoods, Looped local roads, Narrow local roads, T-Junctions, Cars surround pedestrian islands, Continuous access drop off and pedestrian density created by traffic and Car pedestrian symbiosis.

Major roads outside neighborhoods

The university community is threatened by two major roads - Franklin Boulevard splits the university in two, makes access to the Millrace and the waterfront all but impossible, and makes expansion on this land very difficult. The SP rail tracks, further north have the same effect. Further, a threatened freeway, planned for the 1990 Oregon transportation plan, which would follow the south bank of the river with the idea that Franklin would be closed when and if this freeway were built.

In our judgment, it would be best for the university if Franklin were closed, and a new artery built on the SP right of way. See the discussion under CAMPUS, where we have already stated:

Policy 7. In order to create continuity of university land between the present campus area, the Millrace, and the riverfront, and to protect the Millrace and the riverfront, a new arterial road, large enough to replace Franklin Boulevard, should be built on the present Southern Pacific right of way, either directly north or south of the railroad tracks. This arterial road should be sunken, to reduce the effects of noise, and bridged by very wide tunnels which connect the Millrace area with the riverfront, in at least two points. Land now occupied by Franklin Boulevard should be given to the university.

Remaining patterns

The fundamental question for the campus is: shall it be open to car traffic, or shall it be closed? A first step towards the all-pedestrian-campus has been taken by the recent closing of 13th Avenue.

However, we believe that this policy, and the more general policy of making the campus into a single pedestrian precinct, will only help make the campus dead. The fact is that the openness of the campus hinges, to at least some extent, on the possibility of contact with the outside world, through the car. (See Car-Pedestrian Symbiosis, and Continuous Access.) It is, however, <u>also</u> essential to keep the campus free of through traffic, and to make sure that the pedestrians in the university are safe and tranquil.

The current deficiencies of the campus, in these respects, are:

<u>Looped local roads</u>

It is, at present, possible to drive through the campus. Agate especially high high speed through traffic on it, which separates the dorms east of Agate from the rest of the university.

<u>Narrow local roads</u>

Almost all the roads on campus are too wide. Thirteenth, Fifteenth, Agate and University, especially, are now about 35 feet wide - they should be reduced to 15 feet.

<u>Car-pedestrian symbiosis</u>

Those places where cars and pedestrians interact most naturally - Kincaid + 13th; Kincaid + Education; University at the Student Union; 13th in front of Emerald and Science complex; Agate between the dorms; have no special intensity of activity, because there is no provision for it.

<u>T-junctions</u>

There are two dangerous four way intersections. Agate and 13th; Agate and 15th.

Continuous access

It is no longer possible to drive into the campus easily, drop someone off, or show someone around, and drive out again. This is acute at the 13th Street entrance, and will become worse when we close off other streets to make the campus safer and quieter.

To solve all these problems, we propose the following general policy:

Policy 32. The University should, first and foremost, be considered as a pedestrian precinct - automobile traffic should be clearly subordinated; roads should be limited to providing access to the principal areas of the campus and through traffic should be eliminated entirely. In particular, 13th, 15th, University and Agate, should all be interrupted, at least to an extent which ensures that there is no short cut through the campus. At the same time, the road system should not appear so private that it would discourage townspeople and visitors from driving into and around the campus. To accomplish this, roads should be organized as a system of narrow one-way loop roads laid out so that the loops penetrate deep into the campus and come close to all major buildings. No road on campus should be more than 15 feet wide.

One way of implementing this policy, is shown on the map which follows, where the campus is served by two narrow loops. It is equally possible to implement this policy in a number of other ways. The enclosed diagram shows the variety of possible ways.

A road marked orange, must be a road, and must be modified so that the road itself if only 15 feet wide.

A road marked yellow only, must stay as it is.

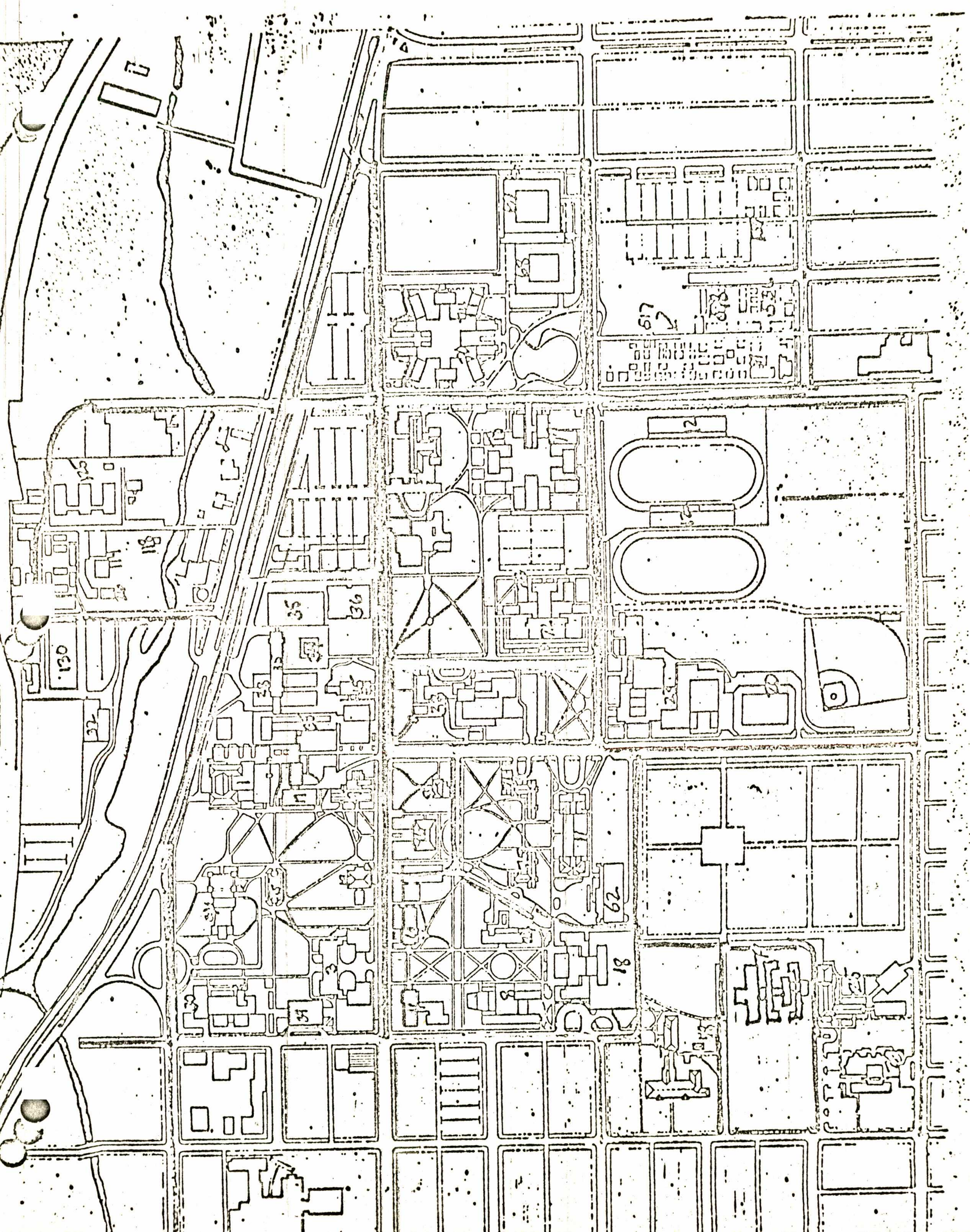
A road marked red, may be built, and if so, must be built 15 feet wide.

A road marked brown, may be erased completely.

A road marked yellow and brown, may stay as it is, or may be erased.

Any system of loops, which follows these instructions, will have the property required. Note, in particular, that all systems require:

<u>Policy 33. Parts of 13th Avenue, between Kincaid and University, should be open, though narrowed to 15 feet, with a wide pedestrian mall alongside.</u>



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PEDESTRIAN PATHS

The relevant patterns are Cars surround pedestrian islands, Activity nuclei, Territorial ambiguity, Centripetal pedestrian paths, Paths interrupt roads and Street lights.

Cars surround pedestrian islands

The pattern calls for convex pedestrian islands, with diameter up to 300', no cars or parking within, and the collection of islands organized, so that a pedestrian never crosses more than 50' of road or parking, between islands.

A good deal of the campus is well-organized in this respect. The entire western side of the campus (from University Street, west) meets the pattern, except for some minor problems.

The eastern half of the campus, however, is less well-organized. The pedestrian islands are poorly defined; they do not pack together - there are ambiguous gaps from one to another; and in a few cases, a road and parking splits the natural formation of the island. Specifically, the area east of the Student Union, and Carson dorm, suggest a pedestrian island, but the area is too exposed to Onyx and the traffic around Carson. The open space west of Friendly, towards the Science complex, is not large enough to become a substantial island, and it is full of parking and the 13th Street traffic. The area around the Agate offices, toward Hamilton and Bean is unpleasant for similar reasons.

The following map summarizes the situation with respect to this pattern. The islands that are rather well-defined are marked with yellow; the islands that break down, with roads and traffic are marked in orange; the areas that are "left out", that do not form pedestrian islands in any clear sense are hatched in red. Roads and parking are marked in black.

It is clear, from the map, that the western half of the campus is the best pedestrian realm. This corresponds to intuition. It is far more pleasant to walk and sit outdoors there, than in the east of the campus, where the islands break down.

Policy 34. Reinforce the campus as a series of pedestrian islands. This means immediate action in the vicinity of the Student Union, and east, toward the dorms. Break up the roads in these areas, so there is no through traffic, splitting the natural islands. Onyx Street is the most obvious candidate.

Activity nuclei

From the point of view of this pattern, the pedestrian paths on campus are faulty: they do not converge on activity nuclei. This is largely due to the fact that the campus has tended to centralize its centers of activity, instead of spreading them across the campus. The Student Union is a nucleus, and the path system does converge on it. But there are other, emerging centers on the campus, and the paths around them are not so well organized. For example, the Science complex is virtually impossible to enter from the west; and PLC-Museum is a potential center, with no strong convergence - the paths seem to pass it by. The list of merging and proposed centers of activity are given in the policy statement for STUDENT GATHERINGS. Path alterations will be required to make the path system conform to these new centers.

In particular, paths will have to be routed into the Science square, from the east and west; through PLC and the Museum, into the central court; into the open space south of Carson, which is presently dead for lack of activity, enclosure and pathway.

Territorial ambiguity

There are very few pedestrian paths which have the character prescribed by this pattern. To make this character precise, we describe the place on campus which works best in this regard: There is a path running north and south, through the old Education Building. The path passes through the building in a gap, about thirty feet wide, that is covered, with an arcade connecting the two buildings. The path goes on, past another small building, and a court. The arcade, running east and west, turns into the building's corridor, with offices opening off it. The ambiguity is great: This short stretch of path is a public path, leading to the southwest tip of the campus; it is the territory of the Education School; it is a covered social area for the offices that open off it. The path is functioning in a very rich way. We estimate 90% of the campus pedestrian system is deficient in this respect. Most of the paths are simply links from one destination to another. They are not rich places in themselves, where things are likely to happen or feelings engaged. A typical case of this deficiency is the system of paths running through the Science square. They are empty of feeling; they bear no territorial relationship to the places they are passing through. Another case is the path past Condon and PLC, to the Library; another, the path north of Gerlinger that runs east, toward Straub and Earl.

<u>We repeat, 90% of the paths on campus are disfunctional in this sense</u>. The map shows the sections of path that work and create territorial ambiguity; these places are marked yellow. The paths marked orange do not have the correct property, but could be improved with only slight modification. The red paths are very far from having the correct property, and require

substantial modification.

Policy 35. Those paths which run beside buildings, should be covered with arcades from the building, so people can stop, sit, and look into the building. The paths marked orange on the map are the candidates for this treatment.

Arcades are the most straightforward way of achieving the territorial character; the path under the arcade is part of the building, yet also public.

Centripetal pedestrian paths

There are several paths on campus where this pattern applies. Some of these paths have a few of the properties specified, but none of them are completely right. 13th is wide and has seats along its length, but nowhere is it covered, and the buildings have not been sited to give a subtle convexity to the path. People do stop there, on warm days students sit in front of Fenton, but the street could be modified, in particular with the placement of new buildings along it, to achieve a better balance.

The other candidates for this pattern, are not so close to solving it. These places are:

1. The paths down to the library from 13th.
2. The paths through Commonwealth, north from 13th.
3. The path down to Lawrence, between Friendly, and the Science wing.
4. The path to Hamilton, between Carson, Student Services, and Walton.
5. The path parallel to Gerlinger, past Susan Campbell and Hendricks.
6. The path down University Street, past Mac Court and the Cemetery.

Policy 36. These places, in general, will need the sidewalks widened in several places, and partially covered; and places to sit in protected areas, looking out, into the activity of the path.

Paths interrupt roads

On the whole, the places where roads and paths meet violate this pattern. The place that comes closest to solving the problem is the Agate Street crossing, from Hamilton to Walton. At this place the pedestrian path crosses the road at a constant level, and with a special paving, and the road rises up, and crosses over the path. The cars slow down, to negotiate this hump in the road, and the pedestrians have a strong right of way, both phsycially and psychologically.

The other major crossings on campus, have nothing of this character. They are the typical crossings, where the pedestrian steps down, into the car's domain. These places create a deficiency in the pedestrian system: they break up paths, and, psychologically they give the car ascendancy over the pedestrian. The places that contain this deficiency are:

1. The crossing at University and 13th.
2. The crossing at Kincaid and 13th.
3. The crossing at Agate and 15th.
4. The crossing at University and 15th.
5. The crossing at University and 18th.
6. The crossing at 14th and Kincaid.

Policy 37. These places require road crossings according to the specifications given in the pattern, Paths Interrupt Roads. We have listed them in the order of severity - the first crossing is currently creating the greatest problem, and so forth.

Street lights

Since the paths on campus are used at night, the presence of street lights plays a basic part in assessing their functional status. The following paths have sufficient lighting, from the standpoint of the specification given in the pattern:

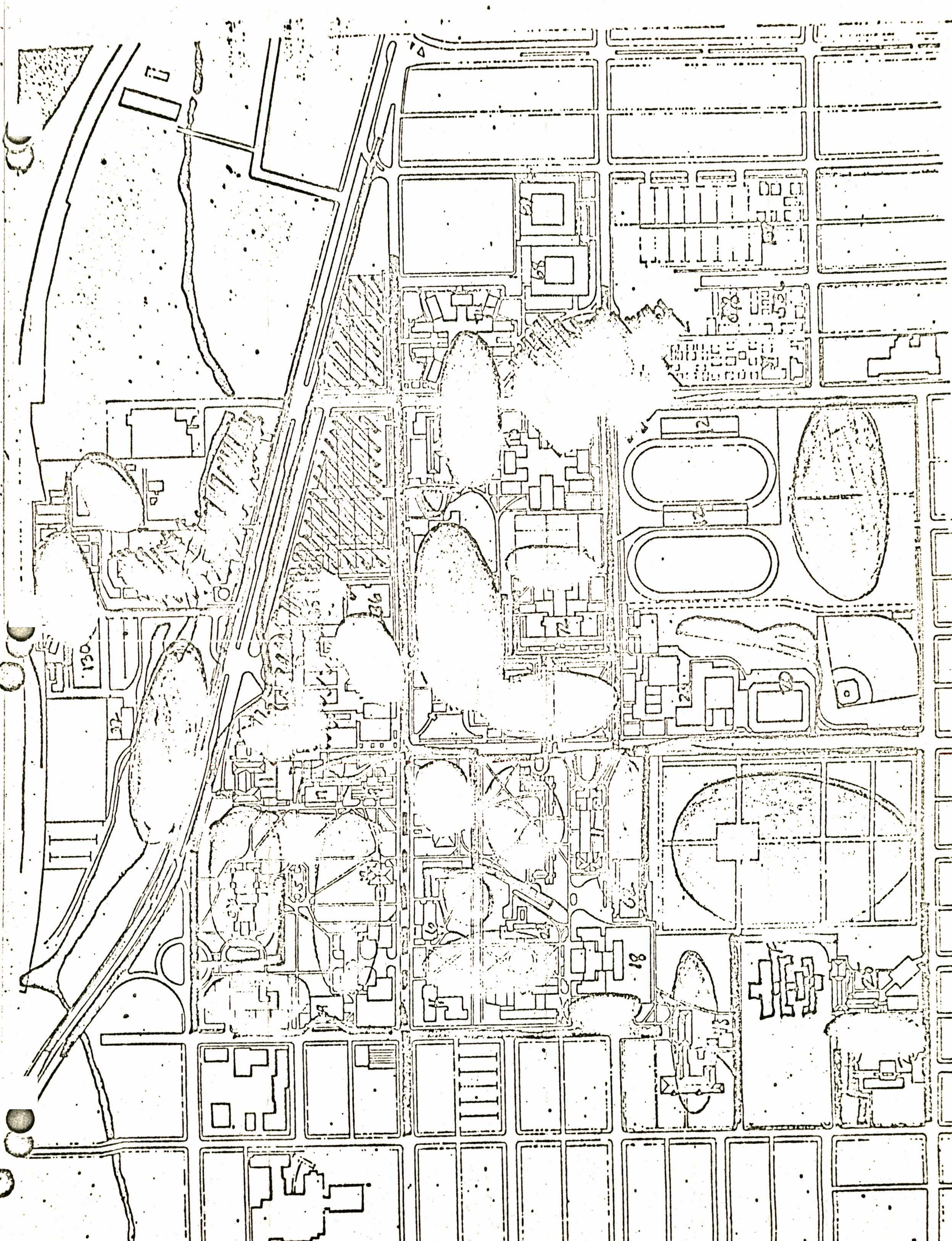
1.

2.

The following paths do not have sufficient night lighting; they are deficient in this respect, and require installations:

1.

2.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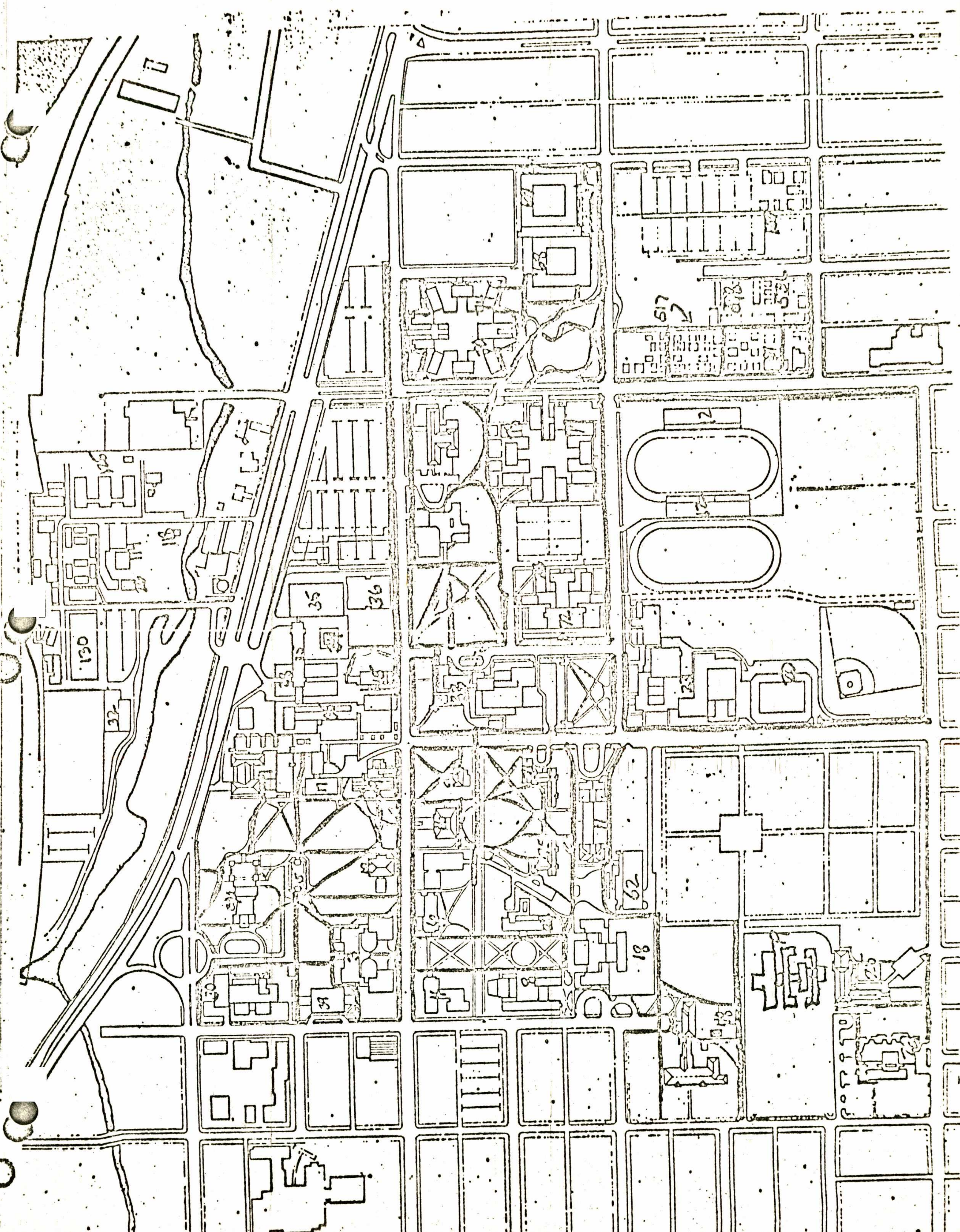
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ENTRANCES

The relevant patterns are Circulation realms and Entrance location.

Circulation realms

With respect to this pattern, we take "entrance" to mean the gateways to the campus itself, the gateways to the major realms of the campus, and the gateways to smaller realms, opening off the larger ones.

From the standpoint of this pattern, the campus is very badly organzied at present. Even at the largest level, there are only a few realms and gateways. And some are partially defined: there are realms without gateways; gateways without realms; realms without obvious circulation spines, realms that are not connected to other realms.

The overall effect is that the circulation system does not add up. It is difficult for people moving through the campus to form a cognitive map of the campus as a whole. The parts that do work, are disconnected.

The characteristic of a well-defined realm is that it is felt, and often easily named by people moving through it. Furthermore, in a well-defined realm, it is never a problem to direct someone who is trying to find his way around within it. On the accompanying map, marked in yellow, we have shown the existing well-defined realms on the campus.

Like a well-defined realm, the characteristic of a good entrance or gateway is that it is felt by a person circulating - it marks the end of one part of the campus, and the beginning of another. We have shown on the map, with black dots, the well-defined entrances, to the realms. (In some cases, the gateways are well-defined, but they lead to no coherent realms.)

There are a number of places on campus that are beginning to be realms and entrances, but which are not yet so well-defined. The partially defined realms are shown on the map in orange; and the partially defined entrances are shown as black circles. These places require modification to strengthen their internal coherence and to connect them to other realms and entrances.

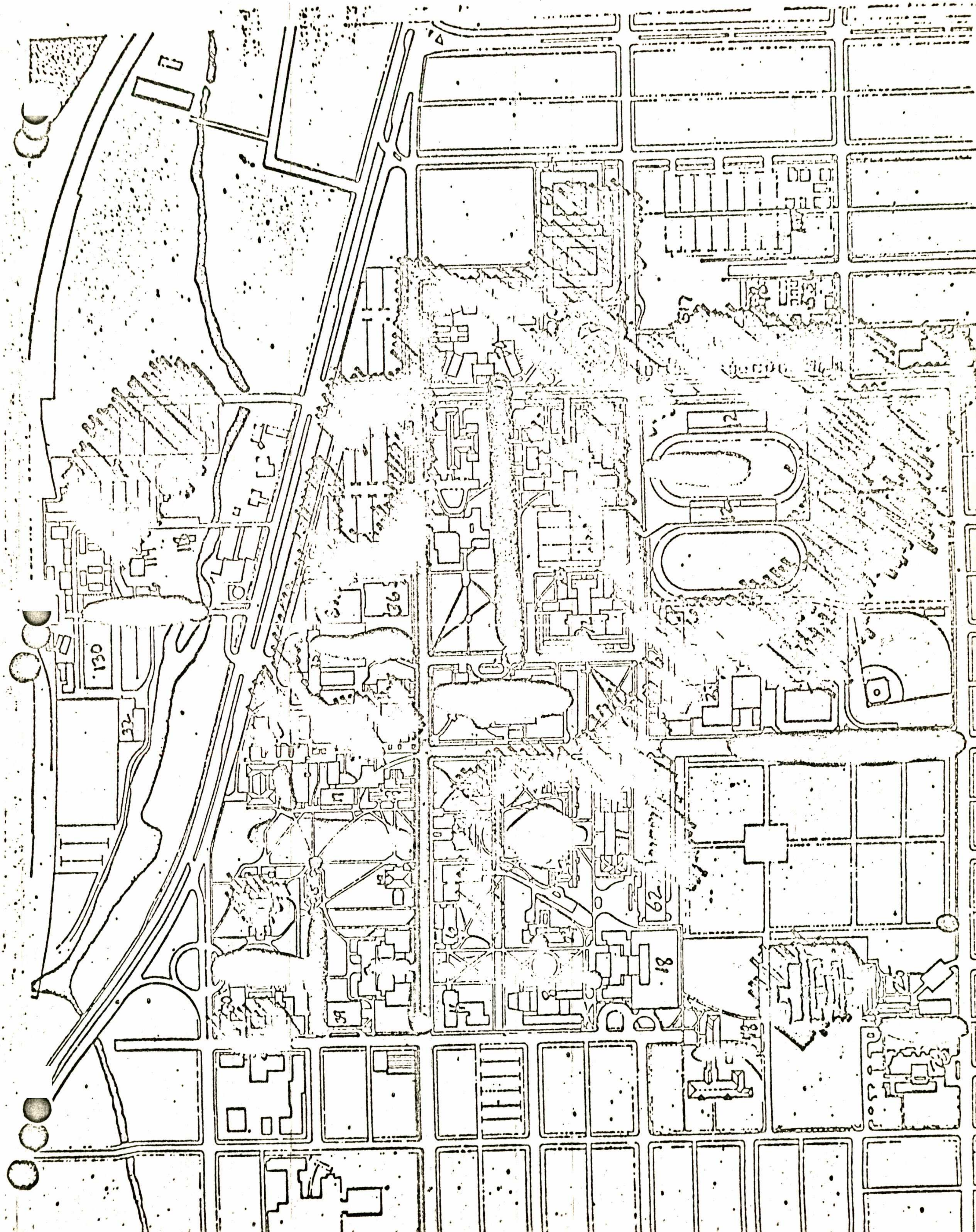
There are other places on the campus for which no realms and entrances are emerging. These places are hatched in red on the map. These places are felt to be "outside" the natural circulation around the campus; they are difficult to find, and difficult to place in one's cognitive map of the campus. These places will require elaborate modification: they require the creation of main entrances, realms, spines for circulation, and entrances off the spines.

Therefore, we recommend:

Policy 38. All future development on campus should be constrained to help the campus become a nested sequence of circulation realms, continuous with surrounding city streets. All development in the orange areas should be organized to amplify the existing realms, and their entrances. All development in the red areas should be organized to create new circulation realms, and to create explicit entrances to the respective parts of the campus.

From the map, we can see that the southeast quadrant, and the east of the campus in general, has the poorest organization with respect to circulation realms and entrances.

Policy 39. In the southeast quadrant, Agate Street should be developed as a main spine, and all other development in the quadrant should be organized to create a main spine, realms and entrances extending into the quadrant from several spots along Agate Street.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BIKE PATHS

The relevant pattern is Bike paths and racks.

Bike paths and racks

This pattern specifies a coherent system of bike paths across the campus, and a bike rack at an entrance to every building. We discuss the paths first.

Currently, there is no identifiable bike system. Bikes travel on the local roads, and on the pedestrian paths. On the paths, they are dangerous. They conflict with the casual gait of the pedestrians. We have noticed the conflict especially along the part of 13th that is closed to automobiles, along the paths to the dorms, between Walton and Carson, and along the thin pedestrian paths, such as the approach to Deady Hall.

From the point of view of the bicycle riders, there are parts of the campus that are difficult to negotiate. It is hard to cross Franklin on bike; and the athletic fields, to the southeast, are inaccessible to bikes.

The following map shows, in yellow, the existing bike paths that are not in serious conflict with pedestrian or vehicular traffic.

The orange shows the paths that are used by bicycles, and where conflict occurs between the bikes and pedestrians, and the bikes are considered a menace.

The red shows areas that are virtually impossible for bike riders to negotiate.

We can see from the map, that, essentially, the bikes do not create conflict while they are on the slow-moving local roads; but as soon as they cross onto pedestrian paths and squares, they become a problem.

Policy 40. Bike paths should be created, as specially paved strips, alongside all those main pedestrian paths, marked in orange on the map. In particular, the paths running perpendicular to 13th, between Kincaid and the Student Union, and the paths from the Student Union to the dorms, will be given priority in this regard.

These areas get the heaviest pedestrian and bike travel, and they are where most of the conflict occurs.

We turn to bike racks.

There is to be a bike rack and shed, associated with an entrance for every campus building. The rack and shed may be up to 100' from the entrance, and from the rack to the building there is a raised, covered walk. None of the bike racks on campus have this property, and so they are all defective to some degree. First, there are buildings that have adequate bike racks, but where the rack is too close to the entrance, or the organization of the rack is such that people ignore it, and drive up to the entrance. These places are:

1.

2.

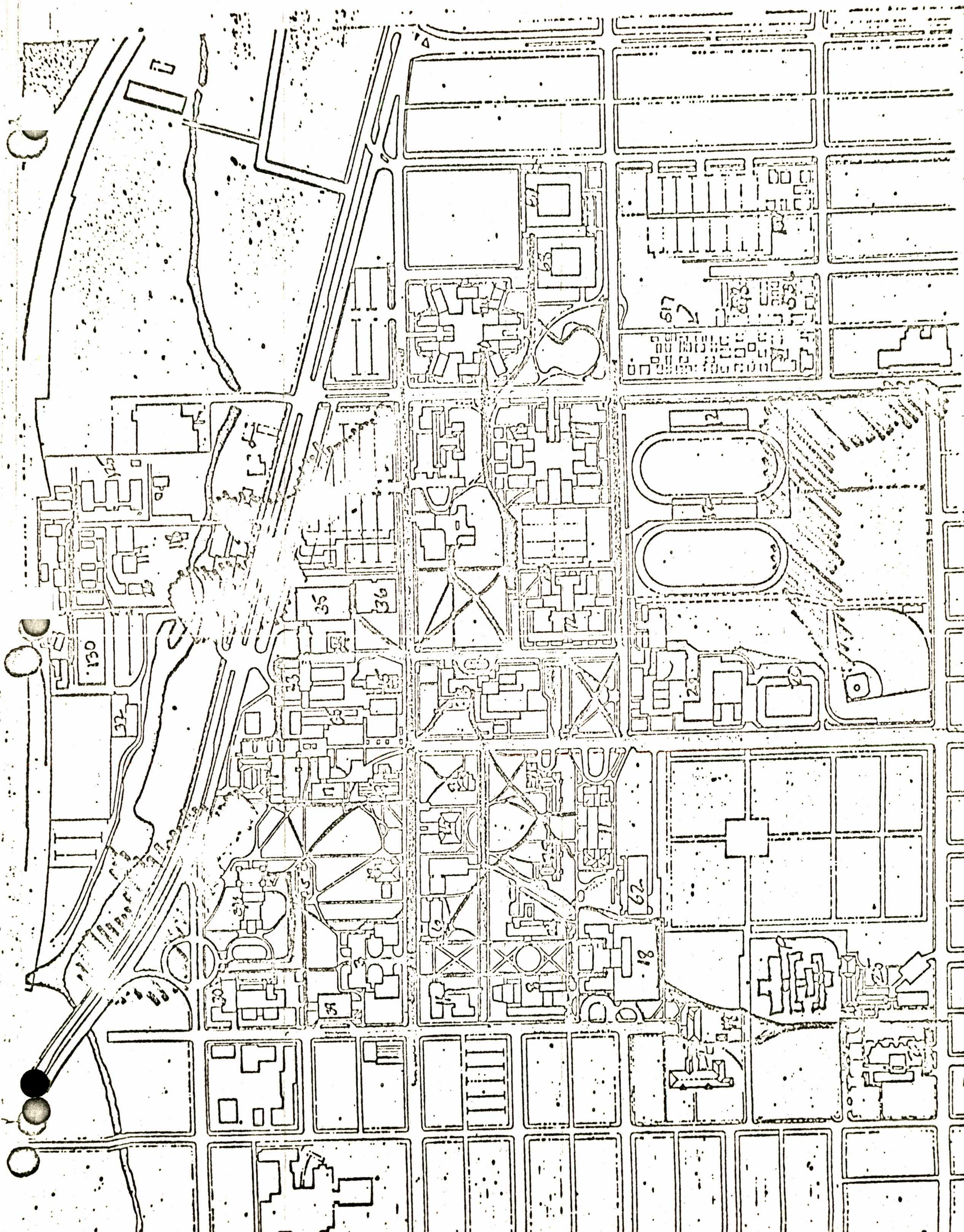
3.

Second, there are places where bikes collect, but where there are no racks, and they become barriers to pedestrians:

1.

2.

3.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STUDENT GATHERING

Note: The present Student Union is greatly overcrowded, and there is an urgent need to provide extra space for student offices, eating places, child care, and recreation.

The current design for the Student Union extension was, however, complete before the start of the master plan. There was therefore no opportunity for the members of the user group responsible for its design to benefit from the criteria developed in the master plan, and as currently designed it does not conform to these criteria.

To illustrate the potential effect of our master plan on typical projects, we intend to show a design for the Student Union extension which does reflect the principles of this master plan, among the example projects of Chapter 9.

The relevant patterns are No isolated student union and Activity nuclei.

<u>No isolated student union</u>

The present student union is highly centralised. It would, however, be contrary to this pattern to centralise all future services and facilities. There are virtually no lounges, cafes, student meeting rooms, etc., anywhere else on campus. The students who are far from the Student Union, like those in the Education/Music area, the Millrace, the dormitories, etc., are deprived of student territory near them where they can relax, or have a cup of coffee.

It may make sense to locate certain special services and facilities (student government offices, child care, etc.) in the existing Student Union. But it does not make sense to keep duplicating cafeteria and coffee shop concessions in this one location. Existing eating concessions in the Student Union are already beyond the scale necessary to make them economically and managerially feasible. About 1/3 of them can be decentralized. The main lounge is badly located on the second floor, and is underused.

The University of Oregon has a high demand for student union facilities, because there is a general lack of such facilities in the town nearby. We estimate that there needs to be 11 square feet of student union space per student. However, no one student union except the existing one, should be larger than 3,000 square feet, a typical size for lounge, coffee shop/cafeteria, and a couple of game rooms.

Policy 41. The campus should provide up to 11 square feet/student of student union space. Additions to the Student Union should be dispersed throughout campus, in lumps not to exceed 3,000 square feet. It is essential that these satellites be no larger than 3,000 square feet, to avoid any further over-concentration in single facilities.

Policy 42. Student government offices and other facilities which need to be located in the main Student Union should take over the second floor lounge space, room 101 opposite the Post Office, and the browsing room above; the lounge space should take over up to 1/3 of the cafeteria and coffee shop space, and these in turn be decentralized to satellite unions.

Activity nuclei

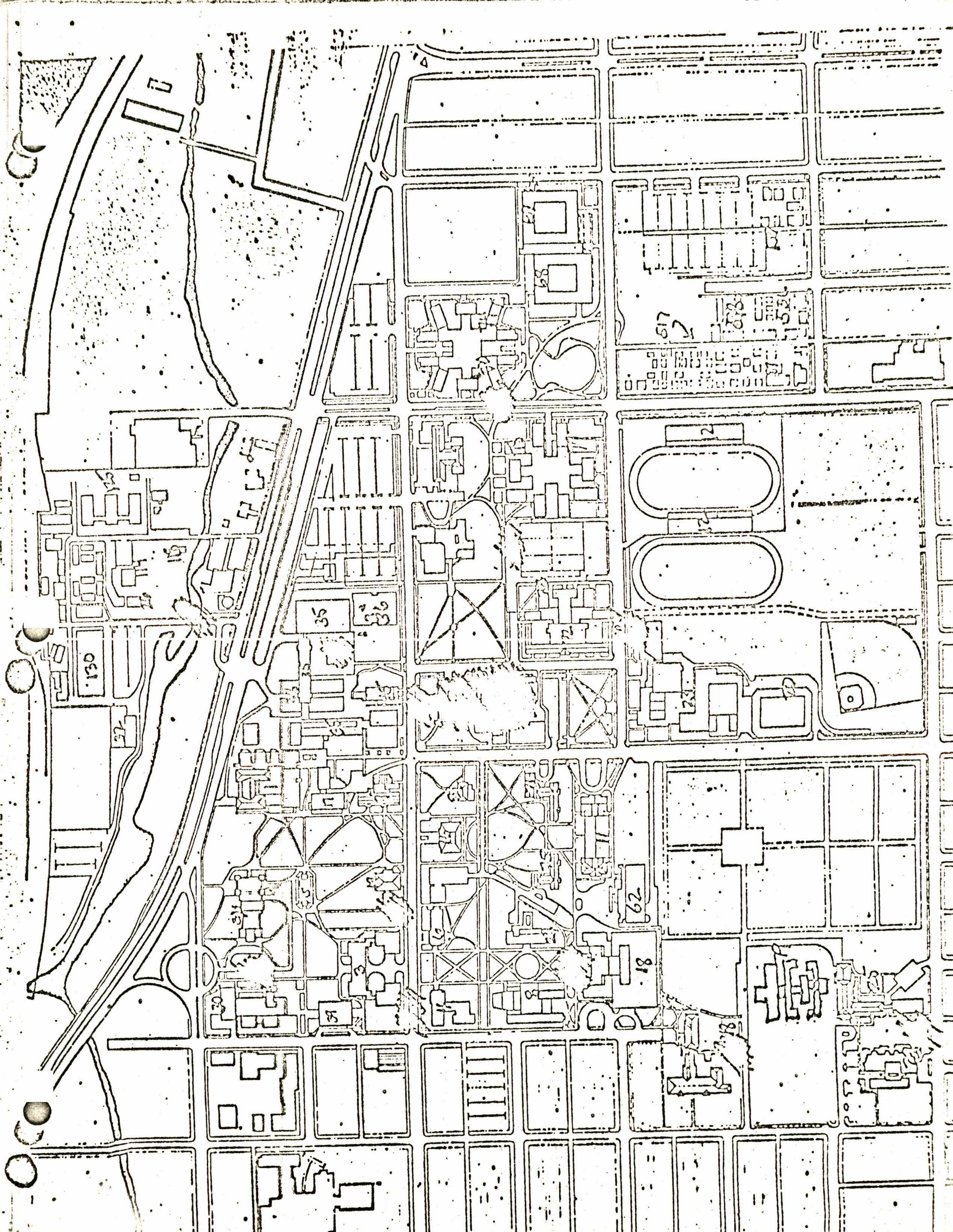
According to this pattern, there must be a limited number of places, which are foci for community services (libraries, cafes, gathering spots, sports), and many paths converge on these foci in such a way as to create intense activity there.

The only place which has this quality today is the inside of the present Student Union. It would be best if this nuclues could move outside the building to the corner of University and 13th so that more paths can converge on it.

The places which are possible sites for additional nuclei, because of their location, relation to paths, and existing activities are:

- 13th and Kincaid
- North end of the Library
- Science plaza
- South of Education
- Between Music and Special Education
- Between Villard and Law
- Tennis courts and 15th
- North side of tennis courts by Walton
- At knuckle between Walton and Hamilton
- Millrace bridge
- Between Fenton and Commonwealth

Policy 43. Future Student Union increments, lounges, sports facilities, cafes, libraries, etc., should be located in the above named places, in each case surrounding a small open place about 60 feet square.



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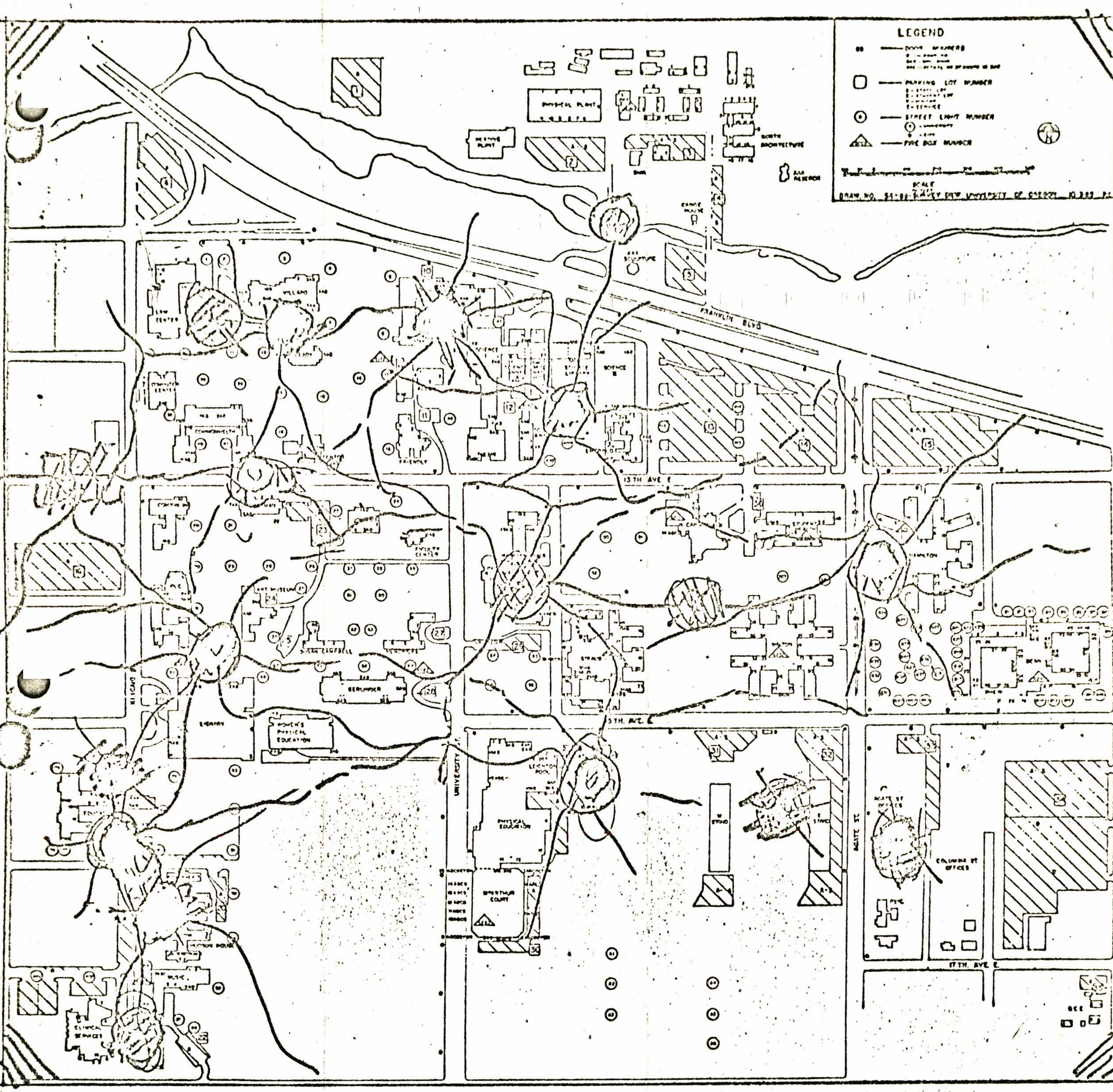


Proposed nuclei
+ paths converging

Existing nuclei.

SHOPS AND CAFES

The relevant patterns are Real learning in cares, and Activity nuclei.

Real learning in cafes

Given the current separation of town and campus, there are, of course, no cafes, or shops on the campus proper, except for the concession in the Student Union. In this sense, all the major pedestrian thoroughfares in the campus are defective.

Activity nuclei

Since there are no commercial shops or cafes or bars on campus, it means that all the present activity nuclei, except two, and of course, all the potential ones also, are defective because they make virtually no provision for public life. The two exceptions are Kincaid and 13th, and the Student Union: Even they need the possibility of more commercial variety. The others (see under Student Gathering Places) have no commercial activity at all.

Policy 44. We believe that commercial leases should be given on university land, to cafes, cinemas, bookshops and restaurants and bars in all those locations marked as activity nuclei, which includes in particular, 13th east of Kincaid, the Franklin crossing, the steps of the Main Library, the Music School. 15th and University, etc., etc. (see the list given under Student Gathering Places.)

LIBRARIES

The relevant patterns are Decentralized libraries and Activity nuclei.

Decentralized libraries

This pattern calls for small libraries associated with departments and groups of departments, scattered around the campus.

The following departments now have libraries of their own:

Sciences
Architecture
Law
Bureau of Governmental Research
Geography
Computing Center
Art Museum
CASEA
Browsing Room (S.U.)
Music

However, in general, the Univeristy of Oregon has allowed its main library to grow at the expense of small, scattered libraries, and the functional failures of such an organization, described in the pattern, are now beginning to appear. We have a number of departments initiating libraries at their own expense to solve the problems of quick access, special collections, and local study centers. All departments should be entitled to such libraries.

Policy 45. A. As a minumum, each department should be entitled to develop a 'reading room" which would include the following:

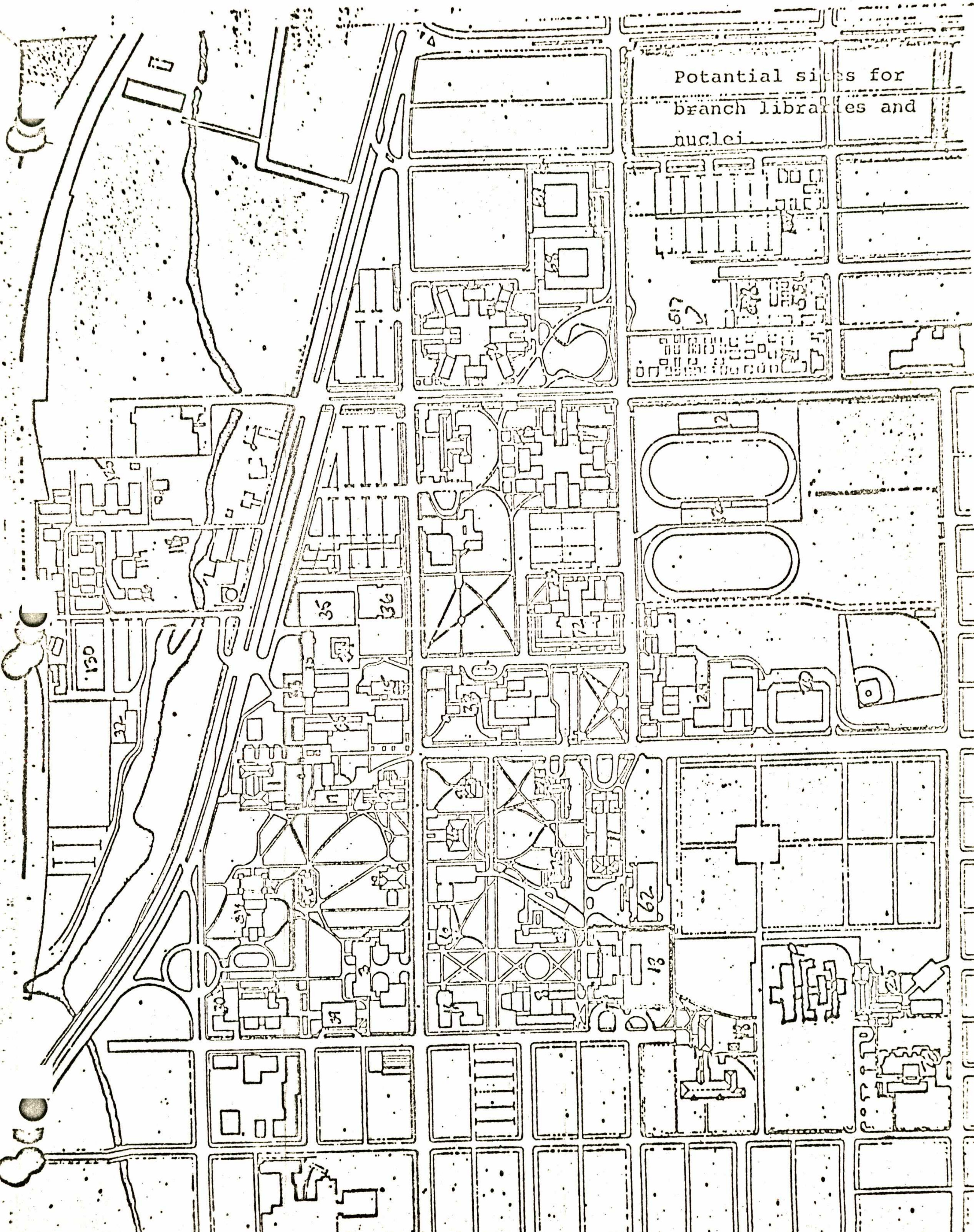
1. The current year's standard periodicals in that discipline.

2. Standard reference works in that discipline.

B. Each department should be invited to submit a proposal for the development of a branch departmental library; when proposals overlap, the affected departments should be invited to submit proposals for joint inter-departmental branch libraries.

C. Branch libraries (not reading rooms) should be staffed through the central library and all materials should continue to be catalogued through the main library.

D. No future additions should be planned for the main library; Fenton Hall should be retained and should be restored to its original library function either as an undergraduate library and reserve reading room or as an interdepartmental branch library.


Potantial sites for branch libraries and nuclei

SPORTS

The relevant patterns are Relax - Leisure is a part of learning and Activity nuclei.

Relax - Leisure is a part of learning

This pattern states that within 400 to 500 feet of every place on campus, there must be a sports activity - tennis, basketball, swimming, billiards, bowling, etc.

At present there is an over concentration of sports activities in the two athletic complexes for men and women. They contain all the gym and sports type facilities one can expect in a physical education program, but because they are concentrated, and deep within buildings or fenced off, they are not available to the community at large.

The Student Union has a number of recreational sports activities such as billiards, pool and bowling. These are in the basement and hard to find; many students do not even know they exist.

Some of the sports facilities in the two athletic complexes should be moved to other places, the ones remaining should be made much more accessible to the public. For example:

In the Men's Gym, there is a nice relationship between the corridor and the handball and squash courts, but the corridor itself should be made much more accessible to the public. The track fields should be made more accessible to the public for general jogging, while the baseball and open fields could move to the other side of Franklin.

In the Women's area, the open field between Gerlinger and the Cemetery is a very beautiful place and should be left. The facilities in Gerlinger are very close to being nicely accessible to the public because of the wide corridor. The new Women's Phys. Ed. building, however, fails completely in making facilities within it accessible.

The activities in the Student Union need to be opened up to pedestrian paths.

There are only four scattered and open sports activities on campus; they are the tennis courts between Music and Education, and between Walton and Earl, and the basketball courts just south of the Student Health Center, and the boating facilities at the Millrace bridge. These facilities are constantly used, anytime the sun is out, and the students complain that there are not more of them all over the campus. There is a proposal to remove the tennis courts near Education for the Behaviroal Science complex. These tennis courts should definitely stay. Other arguments against building Behavioral Science have already been presented.

The sports in the athletic complexes are too concentrated and should be decentralized. Physical Education gyms, courts, swimming pools, and fields should be open to the public at large, so that they can be used when there are no scheduled classes. Sports in the Student Union must also be made more open and accessible. Additional casual sports activities must be added so that every part of the campus has one of these places within 500 feet of it.

According to our surveys, the right amount of sports facilities are as follows:

		existing	need
Pool and billiards	1 table per 1,000 students		
Judo	1 gym per 5,000 students		
Table tennis	1 table per 700 students		
Basketball	1 basket per 200 students		
Handball	1 court per 2,000 students		
Swimming	1 pool per 1500 students		
Boating	1 facility for entire campus		
Sauna	1 station per 800 students		
Golf putting greens			

Policy 46. The university should provide these sports activities to meet these standards, in locations compatible with the following chart.

Activity nuclei

This pattern states that sports be located in activity nuclei. (see STUDENT GATHERING.)

Since it rains so much in Eugene, we suggest that there be at least one indoor and one outdoor sports at each activity nuclei, so that there will always be one activity available regardless of weather.

The following place needs one outdoor sport:

University and 13th (Student Union)

The following places need an indoor activity:

South of Education

North side of tennis courts by Walton

Millrace bridge

Knuckle between Walton and Hamilton

The following places need both kinds of sports:

13th and Kincaid

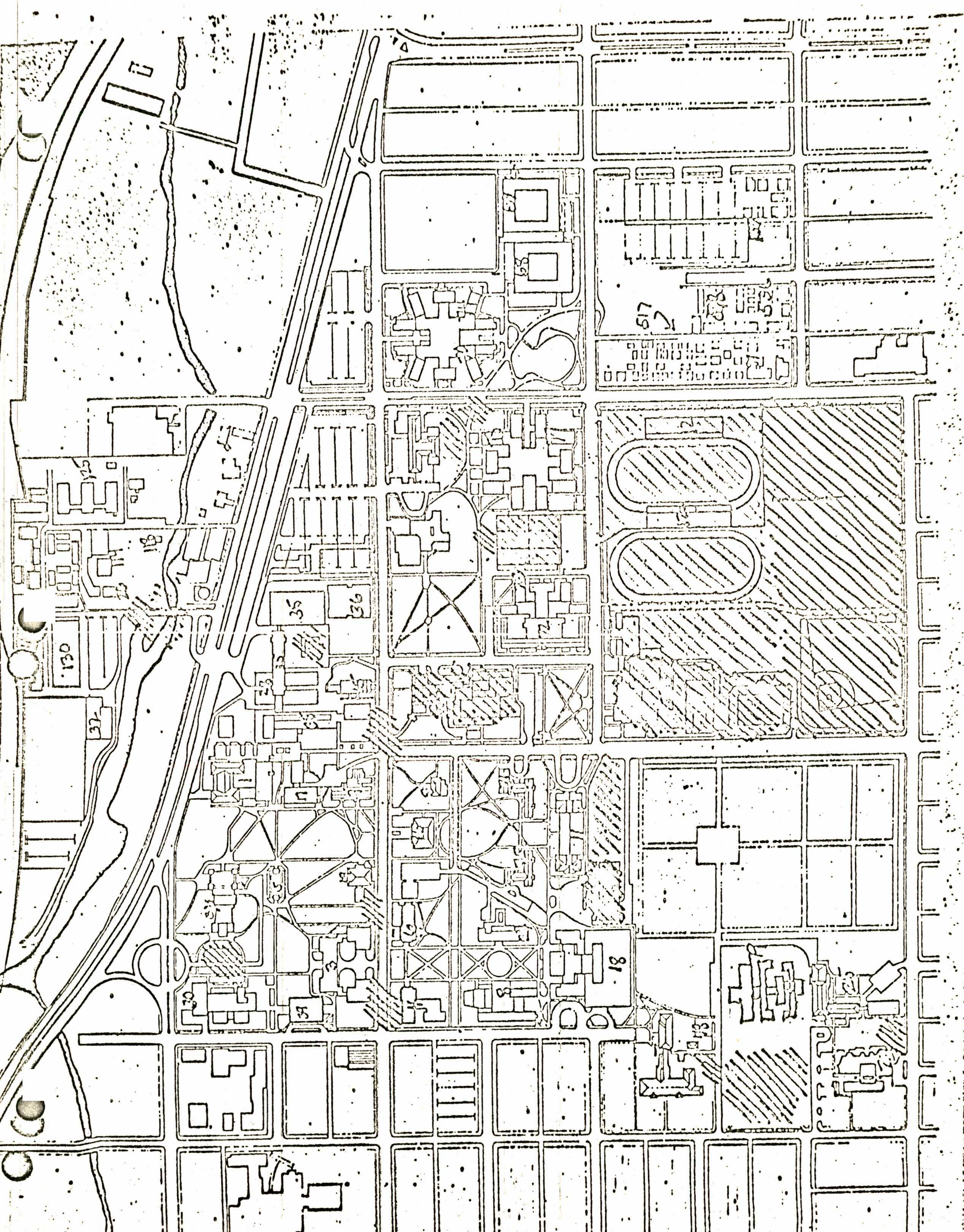
North end of Library

Science plaza

Between Music and Special Education

Between Villard and Law

Between Fenton and Commonwealth


130
35
36
18

CLASSROOMS

The relevant pattern is Classroom size and distribution

Classroom size and distribution

As this pattern shows, there is a discrepancy between the numbers of classes held in different size ranges, and the numbers of available classrooms in these different size ranges. The location of classrooms also fails to correspond, spatially, to the distribution of faculty offices. In order to bring the distribution of classrooms into line with this pattern, it will be necessary to convert some large classrooms to other uses, to build a considerable number of smaller classrooms (of seminar size), and to spread classrooms more uniformly across the campus, to overcome their present tendency to bunch in one or two places of high concentration. Detailed figures on these needed changes are not yet available.

FACULTY OFFICES

The relevant patterns are Students near faculty offices, University as a marketplace and Primary groups among students and faculty.

Students near faculty offices

The faculty is not accessible to students today, because faculty offices are most often located in blocks which are separate from the places where students naturally spend their time - classrooms, student workplaces, gathering places, etc.

1. Places like PLC, Friendly, and Hendricks have faculty offices and a few graduate student workplaces, but no classrooms. In these buildings faculty are accessible only to a few graduate studnets - other students have to make special appointments to see them.

Policy 47. Seminar rooms and additional student workplaces should be inserted in places where there are large blocks of faculty offices, i.e., PLC, Friendly, Hendricks.

2. Places like Architecture, Art, the Sciences have had mixtures of classrooms, teaching labs, student workplaces and faculty offices, but they are not in the right relationship to each other. Most often the faculty offices are separated from the student workplaces and classrooms.

Policy 48. In places which have faculty offices, classrooms, and student workplaces, the three types of spaces should be rearranged so that they are mixed, not zoned off from each other.

3. Areas where classrooms are isolated and in large blocks such as Commonwealth need faculty offices and student workplaces to satisfy the pattern.

Policy 49. Underused classroom areas in Commonwealth and other places where there are large concentrations of classrooms, should be rearranged to include faculty offices and student workplaces.

University as a marketplace

This pattern specifies that faculty offices be near classrooms and that they be identifiable units, with independent entrances from pedestrian paths, so that students can see and have access to all the projects and classwork going on on campus.

Virtually none of the faculty office locations satisfy this pattern, and it is impossible to convert all existing buildings to meet it, especially the upper floors of PLC. However, we may state the following:

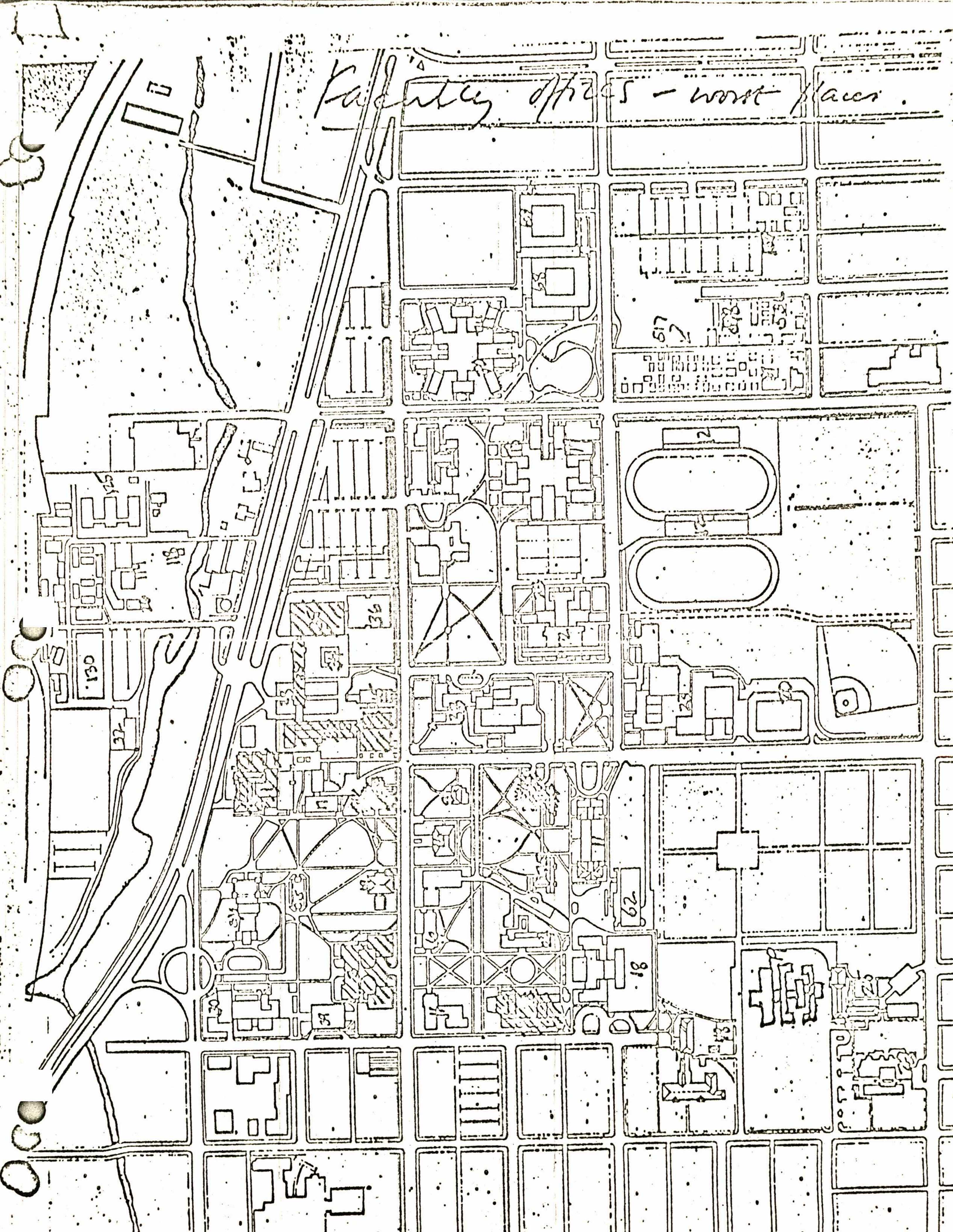
Policy 50. Where possible, any remodelling or construction of departments should locate faculty and classrooms together on the lower floors of buildings, and give them their own entrance and stair from pedestrian paths.

Primary groups among students and faculty

This pattern states that faculty and students should be in groups of 20 to 30, clustered around common entrances, corridors, bathrooms, lunchrooms, etc.

There are very few places on campus where this pattern is met. Its absence is felt most strongly in large buildings, where offices are strung along long corridors; PLC and Friendly, for example.

Policy 51. In PLC, Friendly, and other places where there are many undifferentiated offices and workplaces, space should be remodelled by opening up corridors, or occasional office spaces, so that faculty offices and student workplaces form groups of 20 to 30 around a common lounge/lunchroom space.


Faculty offices - worst places.
517
2
181
130
32
62
18

STUDENT WORKPLACE

The relevant patterns are Workplace for every student, Faculty offices near students, and Primary groups for faculty, students.

Workplace for every student

This pattern calls for a workplace for every student on campus: graduate and undergraduate. The university is currently very far from being able to satisfy this pattern. Many of the departments do not even provide space for their graduate students, and only a few departments, e.g., architecture, provide workspace for undergraduates.

The problem is compounded by the fact that undergraduate work stations are not included as legitimate spatial needs in department projects. The State Board does not recognize undergradaute work stations as part of the university's entitlement, and therefore, the needs go unfulfilled. The problem, however, is severe, We have shown in the pattern, that the lack of workplaces plays a basic role in the syndrome that leads to student detachment from the academic community.

Policy 52. We suggest that the State Board and the University departments should recognize undergraduate workstations as a legitimate part of the University entitlement, according to the following standards. 25 square feet per each undergraduate; 50 square feet per each graduate student.

According to these figures the campus is now operating at a great deficit: 2500 graduates currently have no space; @ 50 sq. ft. they will need 125,000 square feet. About 7000 undergraduates currently have no space; @ 25 sq. ft. they will need 175,000 square feet.

The total deficit is 300,000 square feet. To repair this deficit:

Policy 53. Every department should convert rooms, parts of rooms and offices, that are currently being underused, to student workstations for 15% of their majors and graduate students who are now without offices, at the rate: 25 sq. ft. per undergraduate; 50 sq. ft. per graduate.

The departments can create this space as follows: First, faculty offices that are unused (i.e., faculty member works at home; on leave); second, rooms set aside for research projects and seminars, that are not used at night, all day, etc.; third, if departments cannot satisfy the requirement in this manner, they must put in a claim for space in nearby classrooms, and underused lab spaces, e.g., in Commonwealth and Fenton Hall. (15% seems to be a reasonable figure, in that it both makes a dent in the problem, and does not create an impossible demand upon the department for space. A department of 400 would require the conversion of about 1500 square feet.)

Policy 54. In the future, every departmental request for space should include a request for student workstations, in increments of 15% of the non-stationed students, until 60% of the majors and graduates have workstations.

We choose a ceiling of 60%, because it is probably that 40% of the students will be living within a ten minute walk of the department, and will be able to use their homes as a workplace (see the pattern, Students close to campus).

Since for many departments, it will be years before they make a request for space, we also suggest a policy of interim student workstations:

Policy 55. The University should make currently underused space in Fenton Hall, Straub Hall, Agate Street, the Library, etc. into interim student workstations, for students in the large departments and non-majors.

We calculate that the University should immediately create 500-1000 such stations, in a practical manner. The students could be invited to create the arrangements, and, if desks are short, provide their own furnishing.

- <u>Faculty offices near students</u> and <u>Primary groups for faculty, students</u>

The diagnoses for these patterns are given under the policy statement for FACULTY OFFICES.

CORRIDORS

The relevant patterns are Short corridors, Circulation realms, Territorial ambiguity, Corridors which live.

Short corridors

The following buildings have interrupted corridors longer than 50 feet, and thus violate this pattern:

PLC
Bean
Commonwealth
etc.

Policy 56. Wherever feasible, these corridors should be repaired by opening rooms along their lengths, as is needed, to provide an interruption at least every 50 feet along a straight corridor, which may be used for student lounges, or student workplaces.

Circulation realms

The corridors of buildings should give some coherent picture of the system of circulation and realms within the building. Each corridor is the spine or a realm and connects to larger spines of larger realms, or smaller spines of smaller realms.

All buildings on campus are deficient to some degree in regard to this pattern. Buildings in which it is most difficult to identify realms and circulation spines within them are the following:

McArthur Court
New Women's Phys. Ed.
Library
Special Education
Architecture/Art
Villard
Student Union
Fenton
Student Health Center
Science II and the Main Block
Chapman

In most of these buildings, one or the other of the two aspects is missing; either there are no clear realms, or else there are realms, but the circulation does not clearly reflect the realms.

It is very difficult to remodel most of these buildings to satisfy the pattern. It would be helped by grouping parts of the buildings and giving them individual entrances from the outside, as called for by Marketplace. This would, in effect, get rid of internal circulation, and the realms would be small ones with circulation directly off main spines which run around the building

Policy 57. The above-mentioned buildings should have priority when buildings are reorganized along the lines of Marketplace.

Territorial ambiguity

Corridor connections to outdoor pedestrian paths should be ambiguous through the use of extended arcades, extended side walls, smooth transitions between inside and outside and the possibility of walking through buildings. Most all the buildings on campus fail in this respect. The only ones which satisfy the pattern to some degree are Education and Walton, which at least have the beginnings of arcades, and Music which is relatively easy to walk through, and the main entrance of Science East Wing which one can pass through.

Policy 58. All other buildings should open up their corridors to pedestrian paths, straightening them and widening them, when the corridor can become a shortcut between outside paths; remodelling entrances so that there aren't more than 8 risers without an ample landing, and building arcades which extend at least 10 feet along the paths just outside the entrances.

Corridors which live

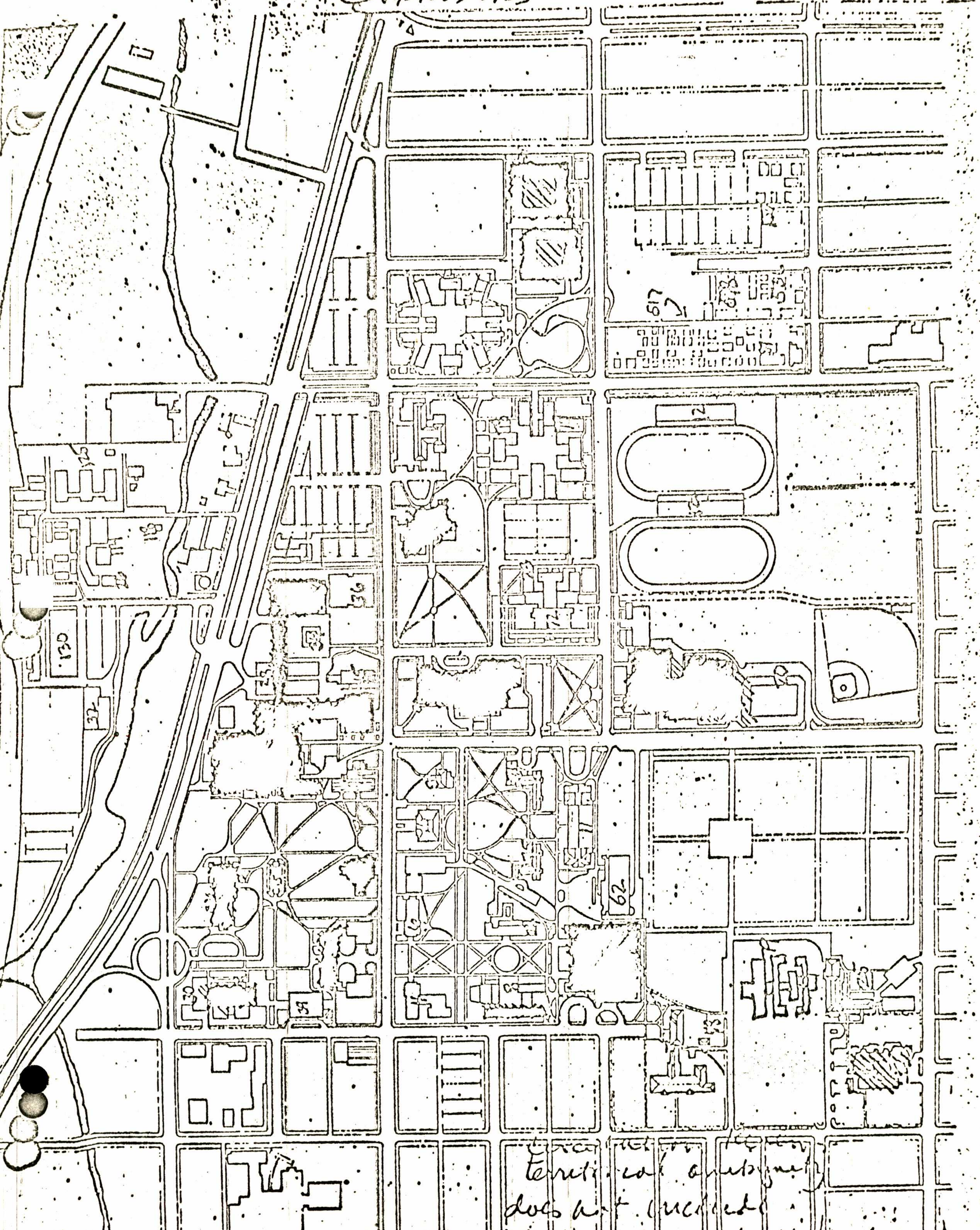
This pattern says that corridors should have concentrations of activities along the way - seating alcoves with vending machines, water fountains, and bulletin boards, for example, and that corridor should have as many windows into rooms and to the outside, as possible.

Virtually no building on campus satisfies this pattern completely. There are some spots in Science and Education, for example, where the corridor widens for a few vending machines. These places are always very well used, and they do liven up the corridor, but there is a real shortage of such places. Their absence is most critically felt in buildings with long institutional corridors, such at the upper floors of PLC.

There are also very few places in corridors from which one can see into classrooms, and offices, so that the 2nd part of the pattern is also not met.

Policy 59. All corridors should be remodelled so that there are glazed or unglazed openings into rooms, and many alcoves for seats, drinking fountains, etc., starting with the upper floors of PLC, and the Science buildings.

CORRIDORS



territorial ambiguity
does not include

CHAPTER NINE: PROJECTS

When complete, this chapter will contain about twenty projects, worked out according to the principles we have defined. These projects will illustrate both the range of projects we anticipate and their presentation, and the overall impact of these projects on the university environment. Tentative list of projects to be included:

Education Department
Psychology Department
Fenton Hall
Music Department
Speech and Drama Department
Emerald Hall and Administrative Services
Mathematics and CSPA
Prince Lucien Campbell Hall
13th Street - West End
Bean Hall
Walton Hall
Westmoreland Married Student Housing
Bike Paths Across One Part of Campus
Biology, Molecular Biology and Chemistry Departments
Special Education Department
Parking - Franklin
Parking - Small Lots
Student Parking
PLC Lecture Hall
Seminar Rooms
Student Workplaces

MacArthur Court
Outdoors - Southwest of Hamilton
Outdoors - North of Commonwealth
Outdoors - West of Erb
Student Union Addition
Franklin Boulevard
Waterfront

The only one of these projects which is so far complete, is the project for the College of Education. We present this project, as an example, to give the reader an idea of what the other projects will be like. The description of the project has two parts:

1. Formal presentation of the project, in terms of its constituent patterns.
2. Economic analysis comparing the cost of this project with the university's current project for the College of Education.

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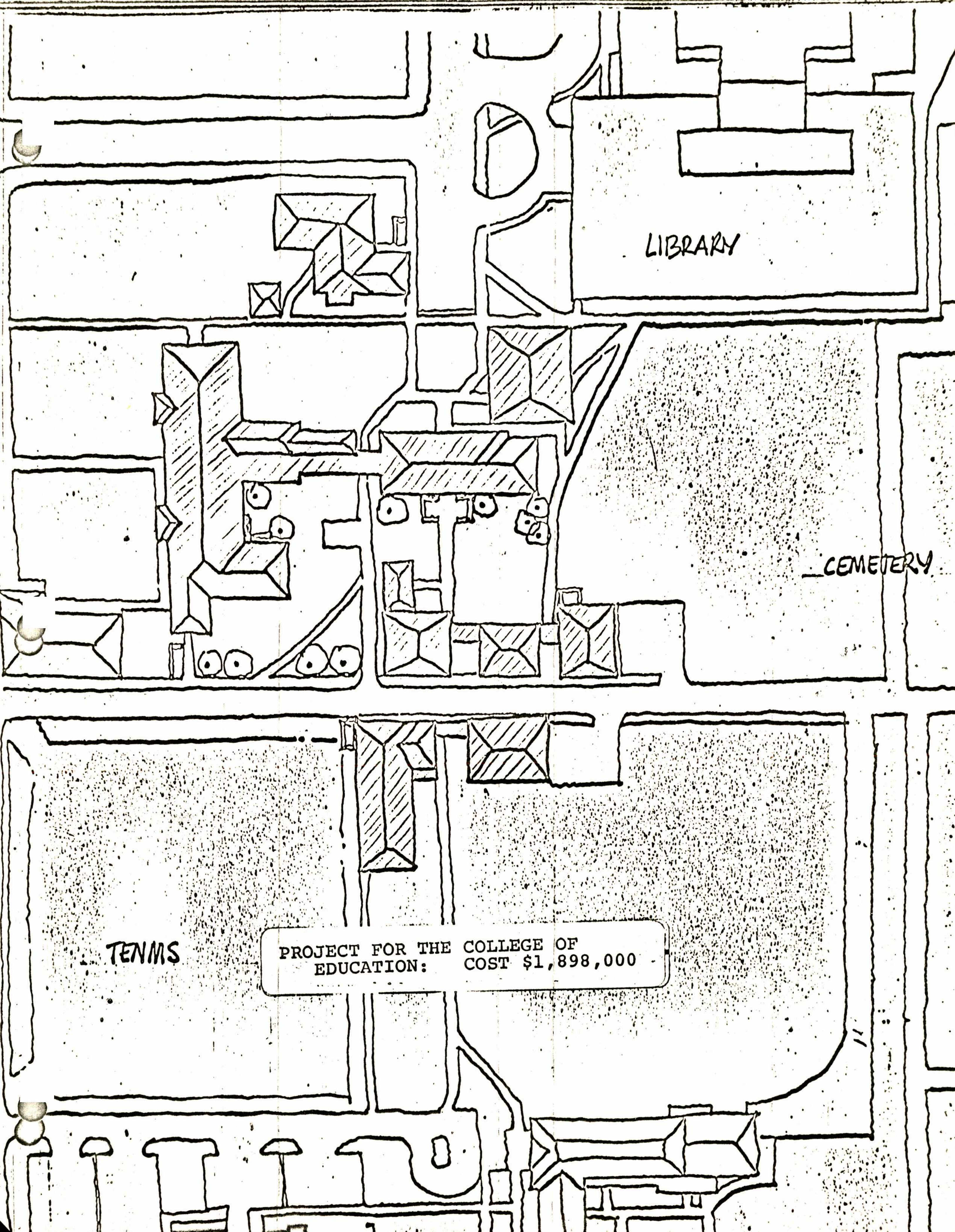
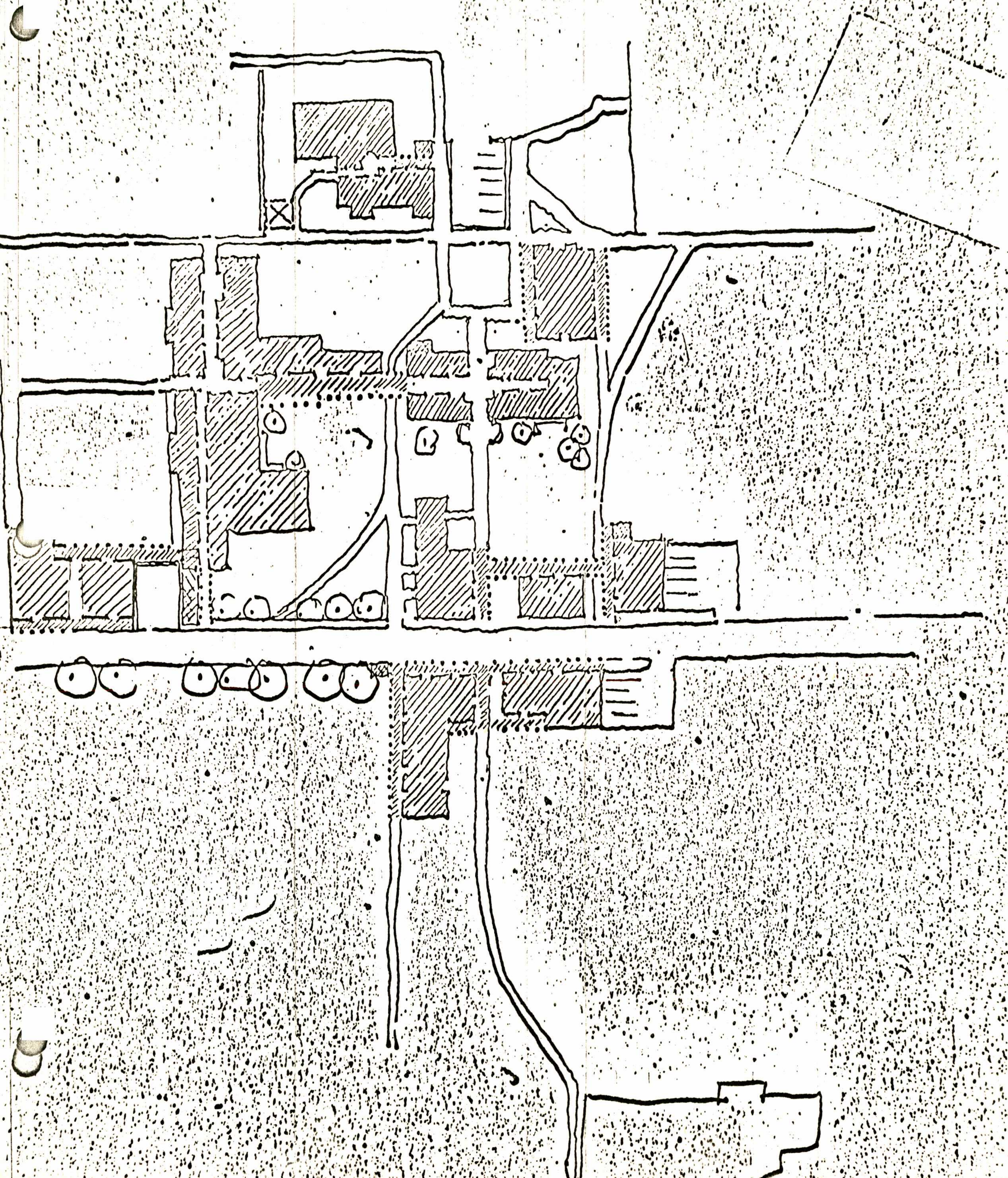
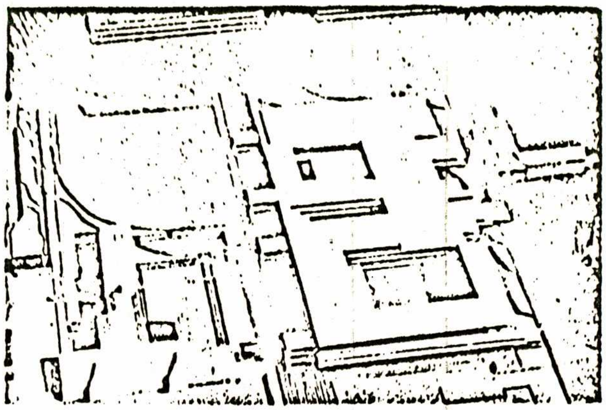
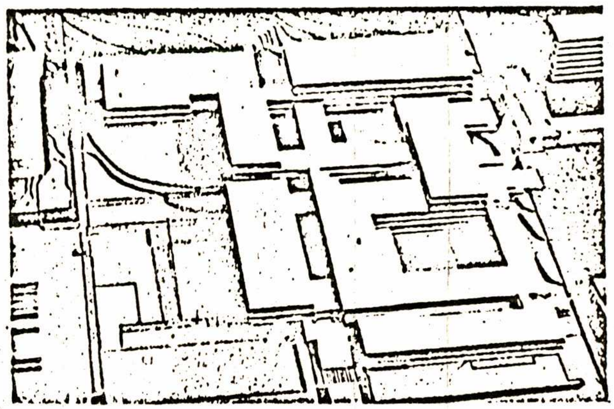


PROJECT FOR THE COLLEGE OF EDUCATION: COST $1,898,000

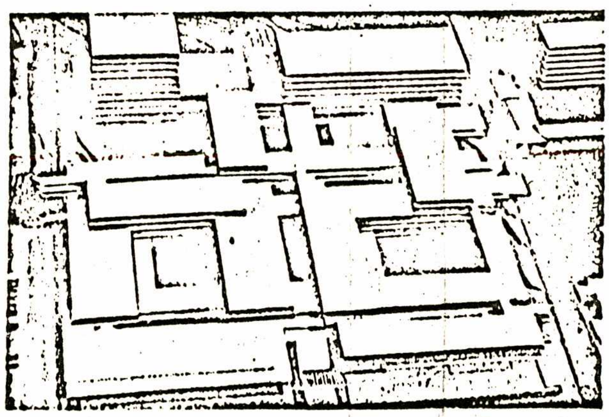




Phase One



Phase Two



Ultimate Phase

FOR COMPARISON, HERE ARE PHOTOGRAPHS OF THE UNIVERSITY'S CURRENT BEHAVIORAL SCIENCE COMPLEX PROPOSAL. THAT PART OF IT WHICH IS FOR THE COLLEGE OF EDUCATION WILL COST $2,830,000.

Draft

Every project proposal presented in accordance with the principles defined in Chapters 5 and 6 has three parts.

A. It must start by identifying the deficiencies in some existing place or places in the university.

B. It must then go on, with the help of the schema given at the beginning of Chapter 7, to identify the list of associated place-types which must be brought into balance to complete this project.

C. It must then finish with a place by place analysis, in which it is stated, formally, how each of the nearby places belonging to these place-types are modified to conform to the relevant patterns. <u>It is important to understand that the design of the project to be successful, must be carried out in the very same order as the presentation is, in this sense, a record of the design process which created this design.</u>

Formal presentation of the project for the College of Education, in terms of its constituent patterns.

I. This project is intended to repair the deficiencies which College of Education is experiencing in the existing Education Building, the Education Annex, and the Education facilities in the Agate Street offices, the Clinical Service trailers, Hendricks and Straub Halls, and the Library.

II. Inspection of the schema given at the beginning of Chapter 7, tells us that a project for a DEPARTMENT will also have to consider all the following types of associated places, in the order given below and bring them into balance, one by one:

DEPARTMENT
PUBLIC BUILDING
OUTDOOR PLACES
LOCAL ROADS
PARKING
PEDESTRIAN PATHS
STUDENT GATHERING
CLASSROOM
FACULTY OFFICES
STUDENT WORKPLACES
BIKE PATHS
SPORTS

III. We now proceed through this list of places, one at a time, showing how we intend to satisfy the patterns associated with each place.

DEPARTMENT

The patterns are: Department space standards, Department size, Fabric of departments, Living woven into learning, University as a marketplace, and Department hearth.

Department space standards: The College of Education is currently operating with a deficiency of 20,953 square feet. This deficiency breaks down as follows:

Draft

36,800 Required office and related space
20,400 Existing office and related space

16,400 Deficiency

6,400 Required research space
1,900 Existing research space

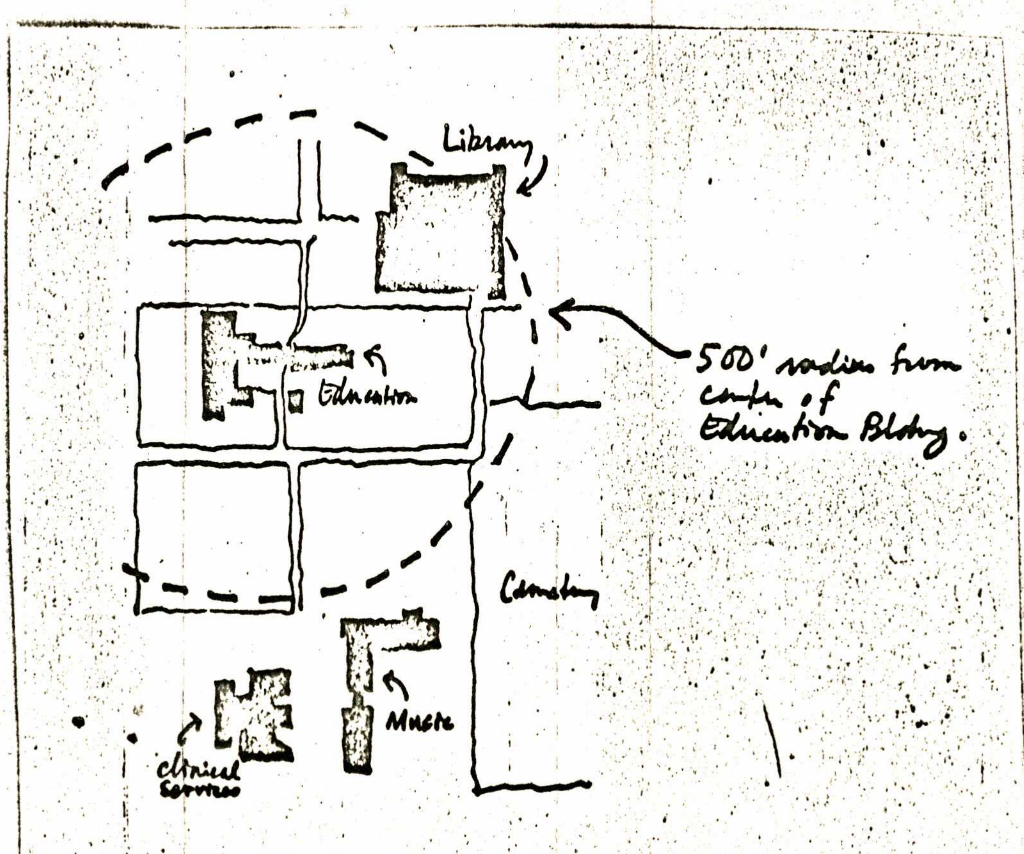
4,500 Deficiency

20,900 Total deficiency.

Department size: There are 1599 students in the College of Education. There are eight departments within the college. The only department that violates the pattern is the Department of Curriculum and Instruction, which has approximately 960 students.

We shall split the Department of Curriculum and Instruction into two departments of equal size. The two departments will, in some cases, share facilities, but for the most part they will be independent structures of faculty and students, with separate hearths, offices, open space, etc.

Fabric of departments: The current organization of the College, and the Department of Education in particular, violates this pattern. The department is spread across the campus, at distances far greater than 500' given by the pattern.



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The College of Education now occupies 6000 square feet of space outside the 500' radius. Most of it is in the Agate Street complex, over 2000' away.

To solve the pattern we must give up the Education offices in the Agate Street area, the Clinical Service trailers, and in Hendricks and Straub Halls, and move them to within 500' of the Education Building and Annex.

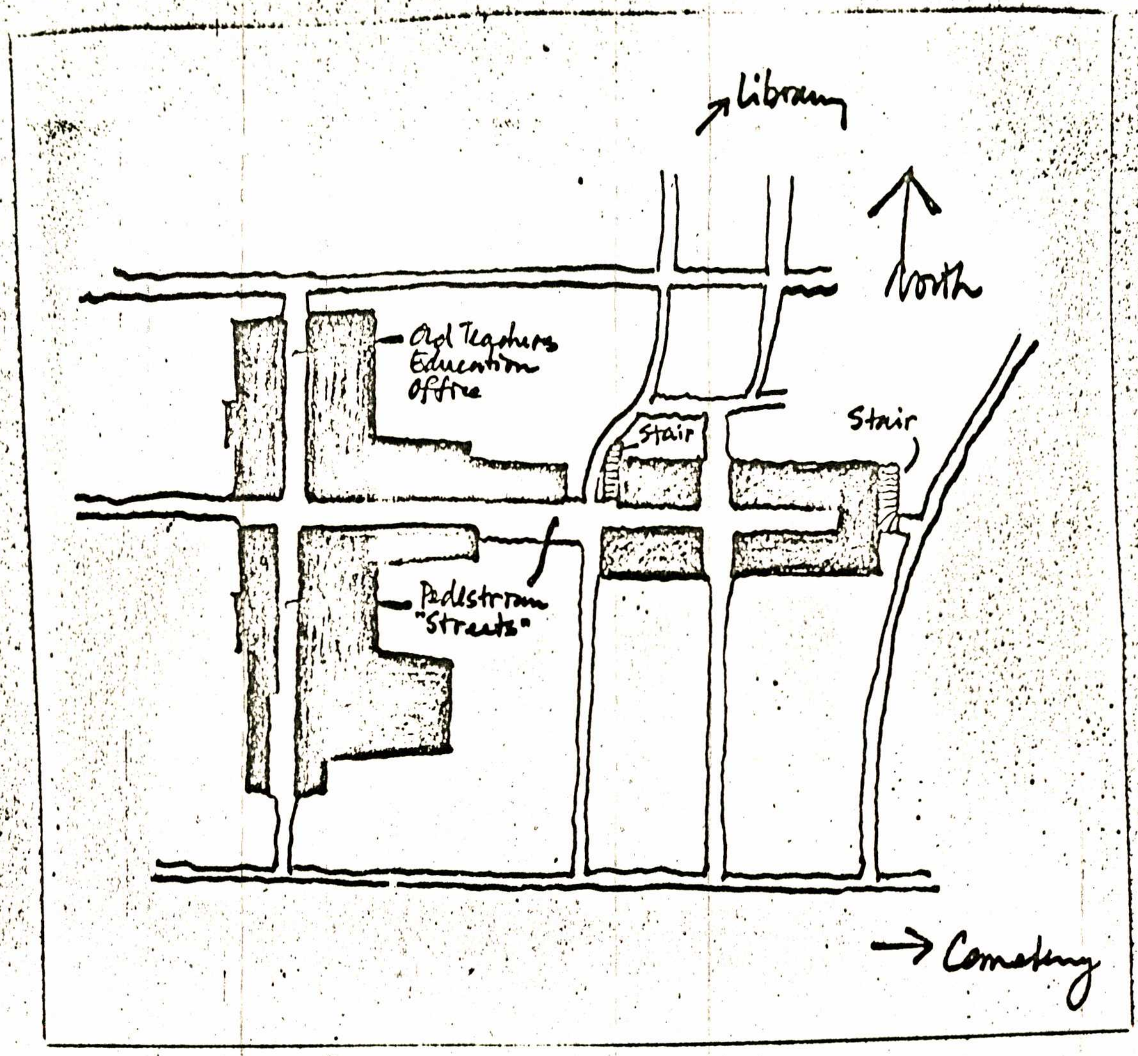
We choose to retain the main Education Building because in many ways it is already adapted to the needs of Education; because it now solves a number of the patterns - in particular, the patterns for PUBLIC BUILDINGS, OUTDOOR PLACES, and PEDESTRIAN PATHS; and, finally, because it is capable of further repair.

(Note: This means that we must now add, to the total deficiency of 20,900, the 6000 square feet to be rebuilt within the Education realm. In short, we require 26,900 square feet of office, research and related spaces, within the 500' radius.)

Living woven into learning: We have not taken this pattern into account in this project. Normally, in a project of this scope, it is necessary to build an increment of student housing along with the department buildings. At the time the Education project was formulated, however, investigations into student housing needs were not complete. We had no idea how much housing is required, what kind of housing is appropriate, or how close it should be to the Education site. Once these things are known, we will have to modify this project.

University as a marketplace: The existing Education Building and its Annex are close to solving this pattern. The following adaptations are required, to solve the pattern completely. The second floor of the east wing must be opened directly to the public domain. Locate outdoor stairs off the paths that approach the building from the north, leading directly to the second floor.

Make the main corridors in the existing building pedestrian streets, with the offices, classes, and labs opening off them. This will mean removing the Teacher Education Office from the corridor space it now occupies in the west wing, and placing it in one of the new structures.



The new construction must also conform to this pattern. First of all, we must create not one new building, but a series of small buildings, corresponding in scale to the various realms within the College. These structures must be no greater than three storeys; they must open off the main pedestrian paths (i.e., the paths running north-south from the Library to the Music School, and the path running east-west, past the existing parking lot, toward the cemetery); and they must contain a series of openings, outdoor stairs, and displays along them.

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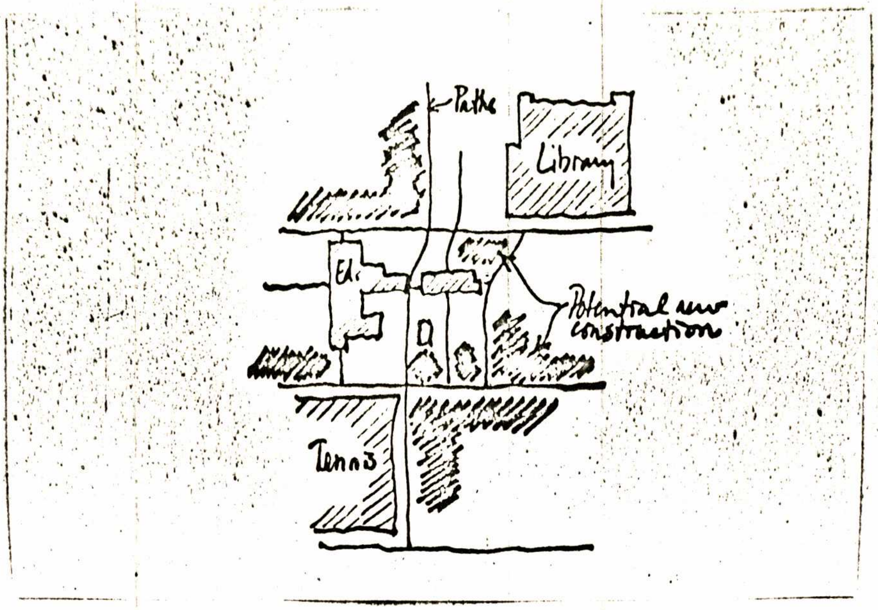
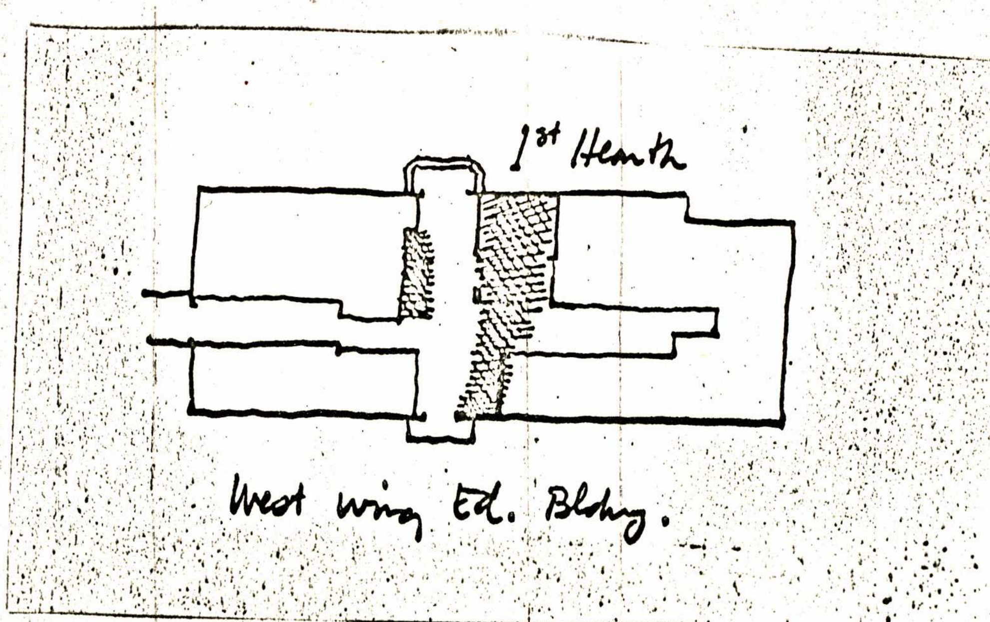


Department hearth: In the existing building, the lobby formed by the crossing of corridors in the east wing, is the most likely spot for the department hearth. To make it complete, it must be larger, and contain more activity. We propose to open the offices in the northeast corner, and turn that area into a relatively open mall, and lounge room, with a wall of shelves for journals and new books. There will be a coffee corner in this area, open to reception and a secretarial pool. This hearth will serve half of the existing Department of Curriculum and Instruction, and several of the smaller departments that make up the College of Education (i.e., Counselling, Educational Psychology).



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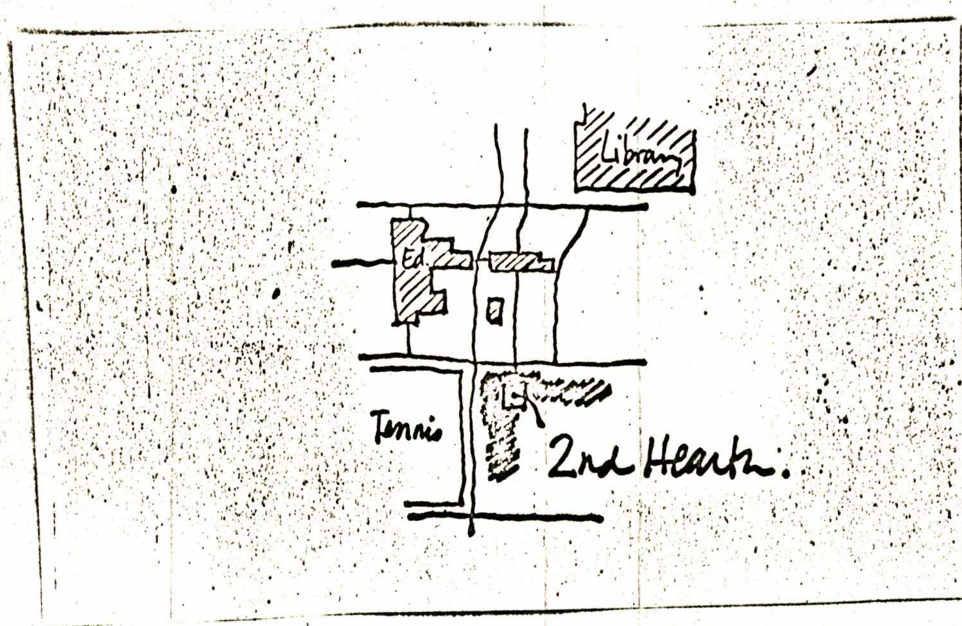
We propose a second hearth to serve the other half of the Department of Curriculum and Instruction (according to the split proposed above, in Department size), and the balance of the smaller departments. This second hearth must be located as far away as possible from the first hearth, and yet still at the center of fravity of the offices, classrooms and labs it will serve. We propose placing the second hearth to the south of the existing building, across from the tennis courts, in the northwest corner of the old Hudson House site.



PUBLIC BUILDING

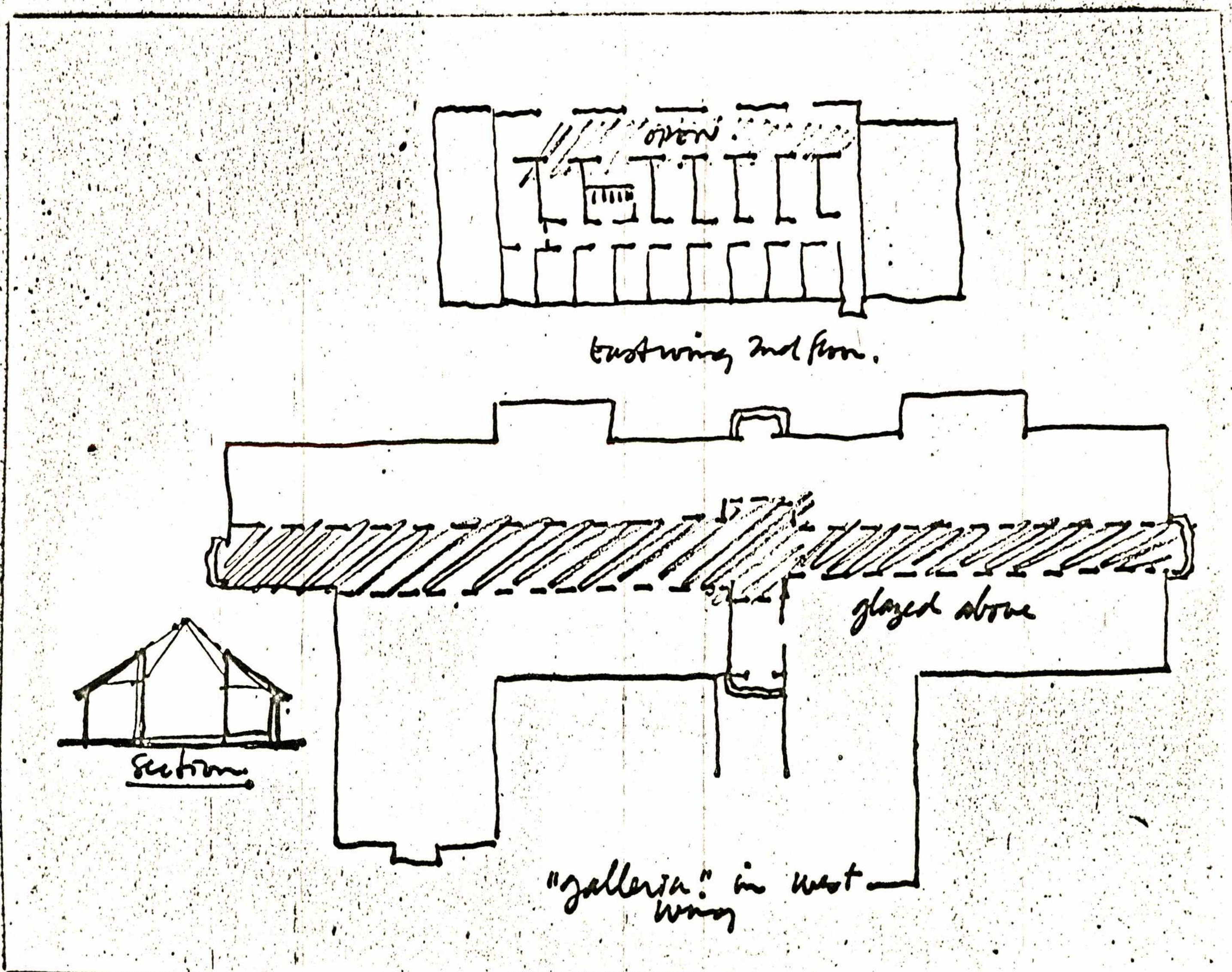
The patterns are: Human scale in public buildings, Buildings shaped for light, Horizontal office buildings, Principles of fire safety, and Feeling of shelter.

Human scale in public buildings: The existing Education Building solves this pattern beautifully. It is a one and two storey building complex. The proposed buildings will all be one and two storey structures, as well.

Draft

<u>Buildings shaped for light</u>: First of all, we must rearrange the partitions in the existing buildings to eliminate interior rooms. In particular, the second storey of the east wing contains eight interior offices. These offices can be improved by opening windows into the long thin room (216A) to their north; and then opening this room with northern windows. We shall also give these rooms skylights through the roof.

In the western wing, we propose to open the roof over the long north-south corridor, and glaze it. This will give the interior spaces the natural light they need, and reinforce the idea that this corridor is a pedestrian "street" - a kind of galleria.



The new buildings will be thin - not more than 50' wide - with no interior rooms. Every space will get at least 50% of its light from the outdoors. The edge of the buildings will be slightly crinkled, so that all the interior spaces can be well lit.

Horizontal office buildings: The horizontal nature of the buildings is already well established. To solve the problem completely we propose that each one of the nine departments within the College be established on either one level, or on two levels within a single building.

Principles of fire safety: Again, this pattern is solved by the features we have already established in the design. The buildings are low; there are no long corridors, and much of the circulation is outdoors, between buildings and parts of buildings; there are outdoor stairs leading directly to the second storeys.

Feeling of shelter: The existing building, particularly the west wing, solves this pattern perfectly. In fact, in this sense, it is one of the most successful buildings on the campus. We shall make the roofs of the new buildings very much like these old roofs in character. They will be pitched, with hip and gable ends, and the eaves will extend to form deep overhangs over paths and entrances.

OUTDOOR PLACES

The patterns are: Convex connected open space, South facing open space, Places at the edge of buildings, Access to a green, Tree places.

Convex connected open space: We begin considering the open space to the north of the existing building. This space is not well-used. It is north-facing, and not sufficiently enclosed, or identified with a building, to become "territory". To create a convex, education court in this area, we first propose purchasing the sorority house on the corner, directly across the path. The house can be converted to accommodate part of the College, it is within the 500' radius, and it is in line with the patterns we have discussed above. The sorority house can account for approximately 3750 square feet of space; it is for sale; and repair is economically viable.

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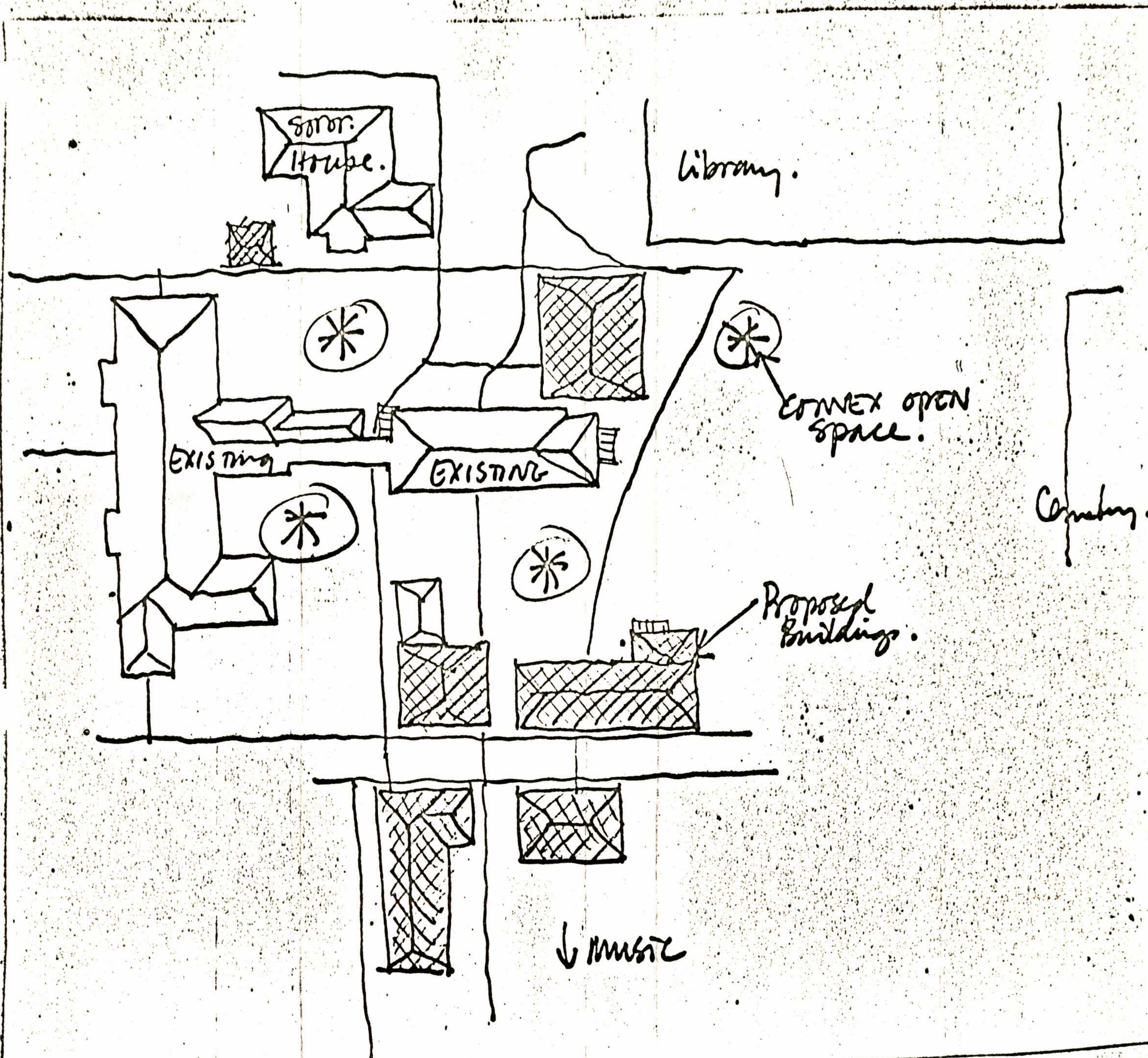
We can now site, in a rough way, a number of structures, to enhance this open space, and to create a sequence of connected open spaces. We propose a two storey structure to the northeast, between the Library and the existing building, to make convex courts of the spaces to the east and west.

Now the open space to the south of the existing east wing is not sufficiently enclosed. Again, to create connected, convex courts, we shall site structures continuous with the Annex, running east-west along the street.

The structures we have now sited, at one and two storeys, account for roughly 20,000 square feet. For the moment, we require 26,900 square feet. To create this space, in line with the pattern, we shall locate buildings along the street, opposite the buildings just sited. These buildings will help enclose the street and begin a sequence of convex courts to the south, towards Music and the Cemetery.



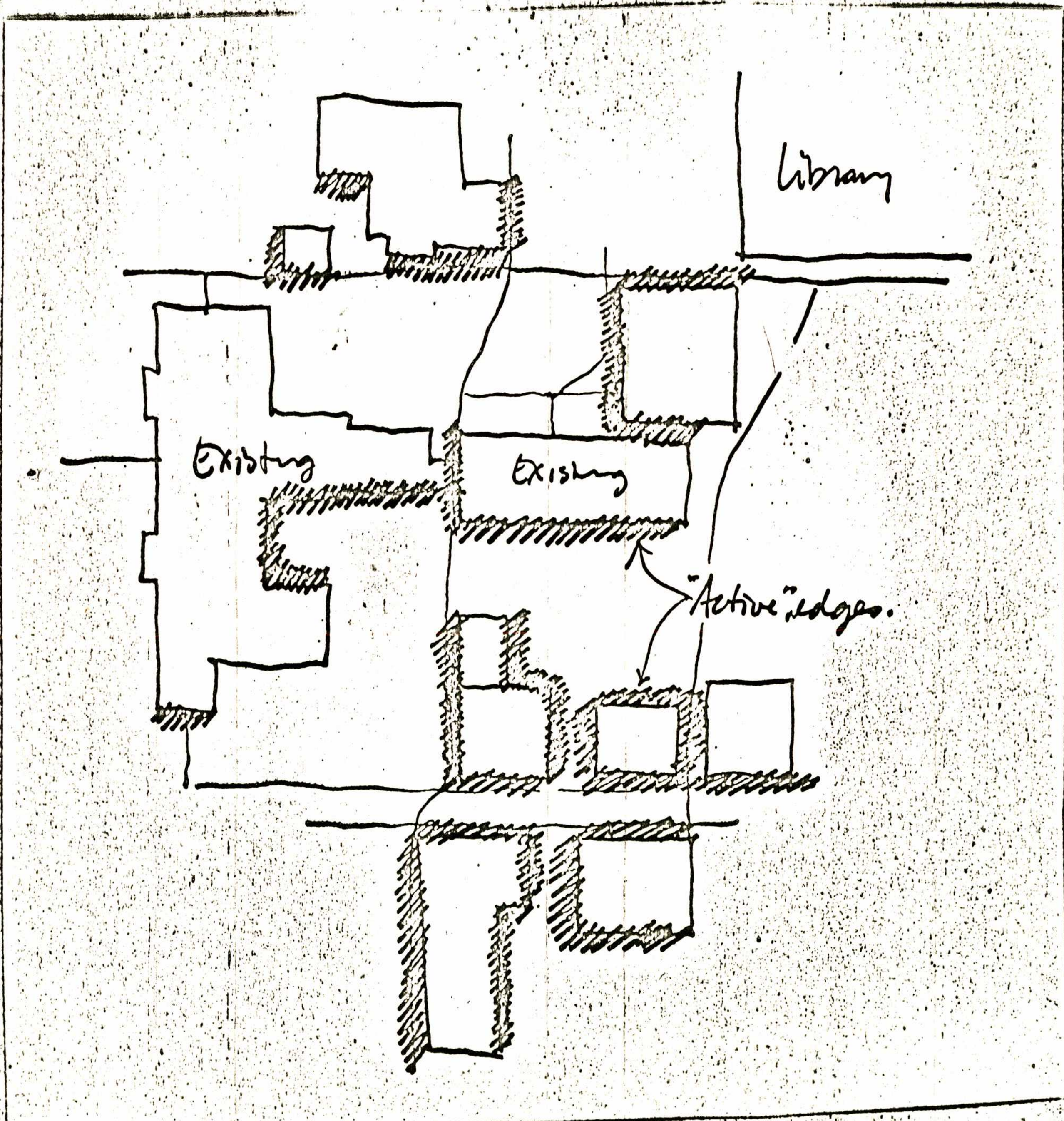
South facing open space: The open spaces we have created all have the south facing property.

The open space west of the existing west wing, has a west and south orientation. However, there are not enough buildings around it, to establish it as south facing territory. It is failing as an open space for this reason. This area is, then, a candidate for another structure, if the College expands.

Draft

Places at the edge of buildings: According to this pattern, we treat the open spaces at the edge of the buildings in such a way as to form natural places, to sit and walk.

In the scheme we are devising, the building edges which function this way are the following:



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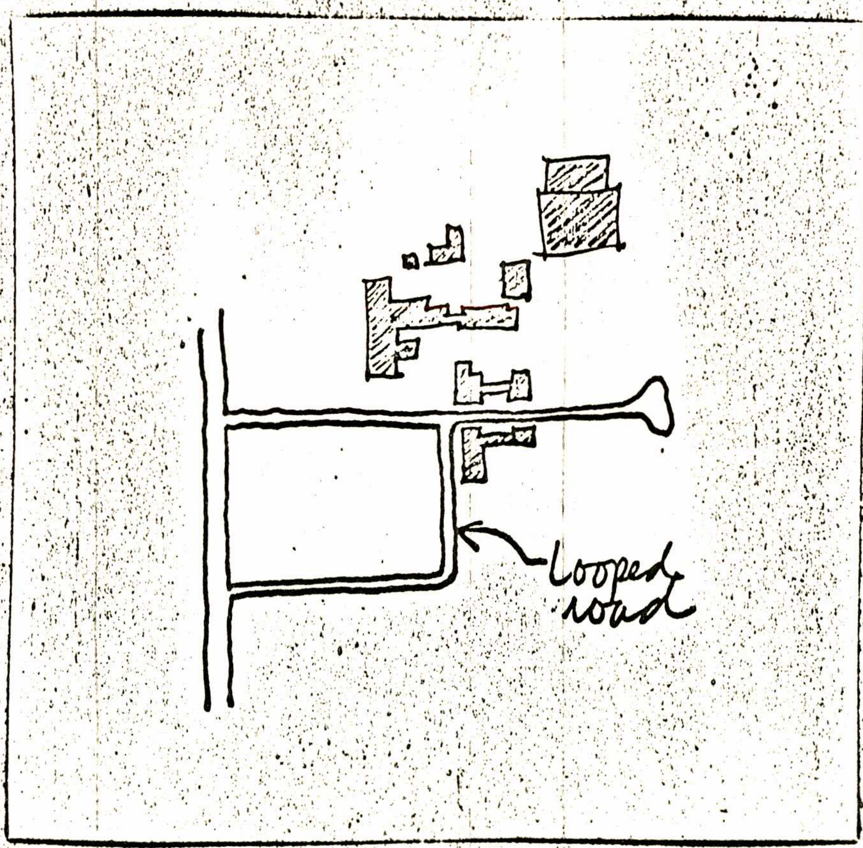
Access to a green: This pattern is solved by the nearby Cemetery, and the open spaces we have created among the buildings of the College. The Library quad, running north to 13th Street, is also within three minutes of the College.

Tree places: At this date, we have been unable to establish the precise location of existing trees on the site. Once this is done, we shall have to revise the project to make the buildings and the paths and trees interact to form useable, social places.

LOCAL ROADS

The patterns are: Looped local roads, and Paths interrupt roads.

Looped local roads: The area is already served by a looped local road. We shall retain this road in the project.



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Paths interrupt roads: The one crossing which deserves attention, is at the corner of the tennis court, near the Annex. The main pedestrian path crosses here, linking several of the buildings we are proposing, as well as the southwest corner of the campus.

We propose to create a road "knuckle", as described in this pattern, at the crossing.

PARKING

The patterns are: Small parking lots, Commuter parking, Short-term parking, and Cars surround pedestrian islands.

Small parking lots: We shall create small lots to the east of the structures we have created along the street. These lots will replace the parking that has been displaced by the new building sites. We propose a third small lot immediately to the west of the existing building.

Commuter parking: Proposed parking policy for the campus as a whole recommends a commuter parking lot beneath the existing tennis courts. This lot, the small lots we have created above, and the small lots northwest of Clinical Services, are all available for staff and faculty of the College.

If the proposed parking policy is altered, we will have to revise this project in turn.

Short-term parking: According to the pattern, the College requires 15-20 short-term parking spaces. We shall provide 20 spaces, along the looped road, with strict one-hour meters.

Cars surround pedestrian islands: This pattern is satisfied in this area of the campus. The parking and the road form the boundaries for the pedestrian islands. There are no cars overpowering the pedestrian realms.

Draft

PEDESTRIAN PATHS

The patterns are: Territorial ambiguity, Centripetal pedestrian paths, and University as a marketplace.

Territorial ambiguity: In part the existing buildings satisfy this pattern. The arcade between the east and west wing, and the "galleria" we have proposed, through the west wing, create ambiguous territory along the public paths.

To establish this pattern in the new buildings, we shall place arcades over the paths that run alongside the buildings, and run paths through buildings and arcaded sections of buildings.

The buildings to the south, in particular, will be open in this way, since there is considerable traffic between the southwest corner of campus, and the Library.

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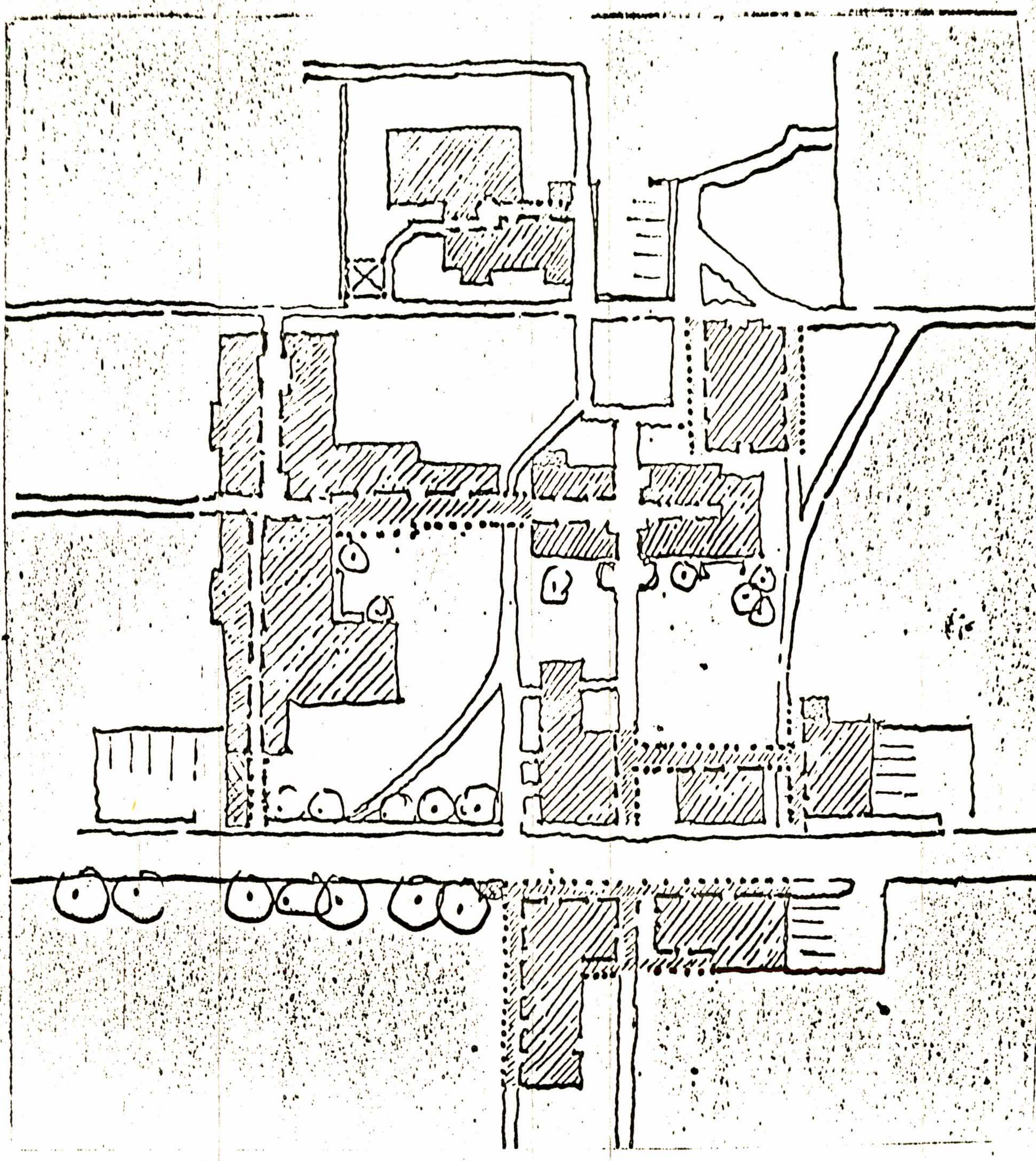
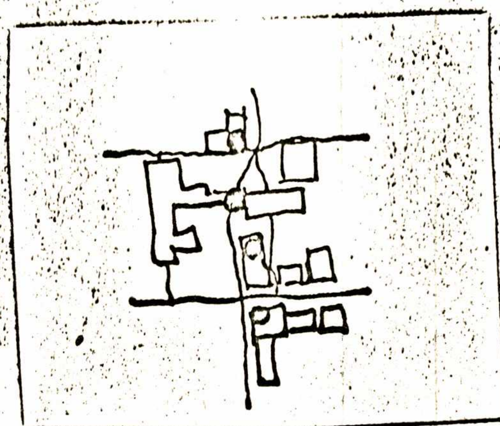


Centripetal pedestrian paths: We have not used this pattern in our design. The paths in this complex do not require the exact "centripetal" organization. There are already many places along the paths that are covered, places to stop and sit, beside buildings. And the placement of the courts, along these paths reinforces this feature.

Draft

University as a marketplace: In terms of pedestrian paths, this pattern asks that the paths run along the buildings with many entrances, and that along the paths there be displays and views into the buildings. Everything except the displays, has been covered above.

We propose to create displays explaining the nature of the College of Education in the following areas:



STUDENT GATHERING

The patterns are: Activity nuclei, and No isolated student union.

Activity nuclei: There is a student center proposed as part of the Prince Lucien, Museum, Library nucleus. This project is within the "basin" of that center, and so there is no need, at the moment to imagine a very large center on this site.

However, we shall provide small student gathering places in each building. The lounge along the corridor, near the west entrance of the west wing will be remodelled and enlarged; it is currently overcrowded and too open to the corridor.

No isolated student union: Again, the proposal for the student center in the Prince Lucien area takes care of this pattern.

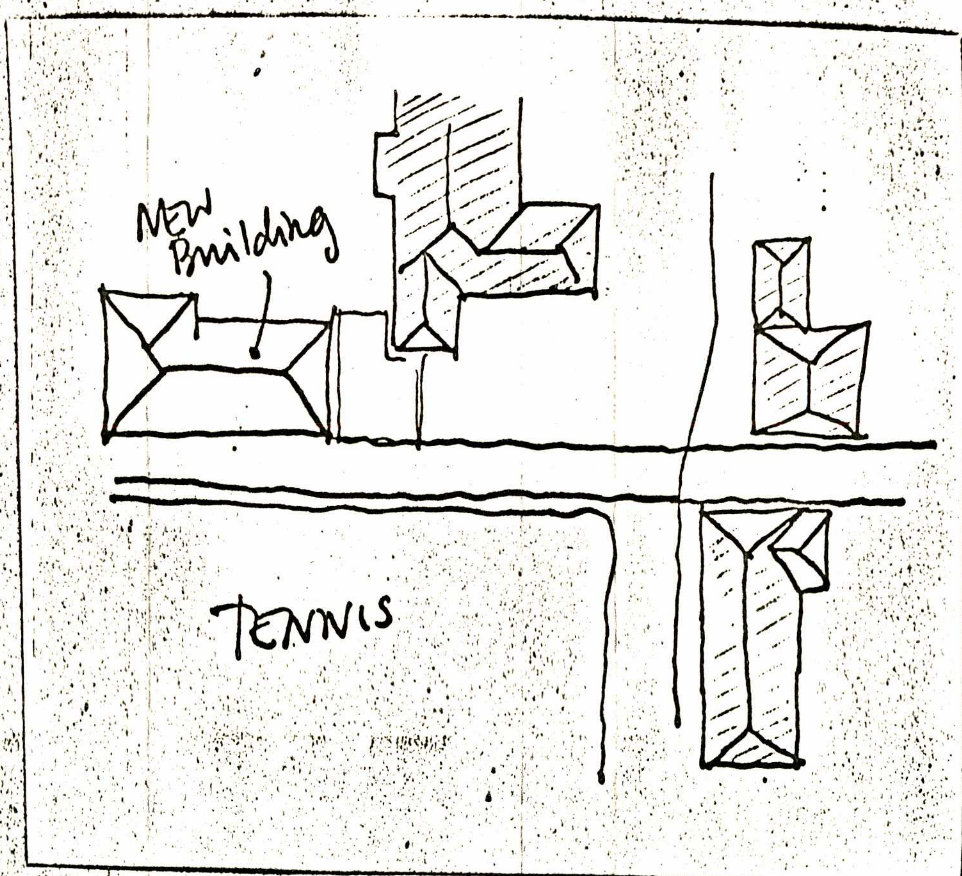
Draft

CLASSROOM

The patterns are: Classroom distribution, and Classroom size.

Classroom distribution: According to our first calculation, this part of the campus must provide 7000 square feet of classroom space to help establish the correct distribution. The program currently provides for 3500 square feet. To achieve the extra space, we shall have to create another small building, or add on to one of the existing buildings.

We choose to create another small building to help solve the siting problem mentioned above, in South facing open space. We shall place this structure at the south end of the existing west wing, running parallel to the street. With this space, we can now provide the correct number of classrooms across the site.



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Classroom size: We ahve not yet analyzed the relationship between this pattern and the College. We cannot specify what mix of small, middle-size, and large classrooms are required.

FACULTY OFFICES

The patterns are: Enough office space, Faculty near students, and Primary groups of faculty and students.

Enough office space: We have not completed an analysis of office conditions in the existing building, and the exact requirements for the new building.

Faculty near students: The faculty offices will be mixed with classrooms, the hearths, and the small student gathering places.

Primary groups of student and faculty: The office themselves are arranged in suites, of 8-15, sharing a social space. We have not yet completed designs for this level. The development of office layouts for the new buildings, will occur in the next stage of the design, with the users.

STUDENT WORKPLACES

The pattern is: Workplace for every student.

Workplace for every student: To solve this problem, we shall have to create even more space on the site. Our initial calculations suggest that the College requires 4000 square feet for student workplaces. We propose enlarging the building added above, in Classroom distribution; and adding a second storey to one of the southern-most buildings on the site.

To review, this means we must now provide about 35,000 square feet of new space on the site. The buildings we have created, at their proposed heights, contain 37,000 square feet.

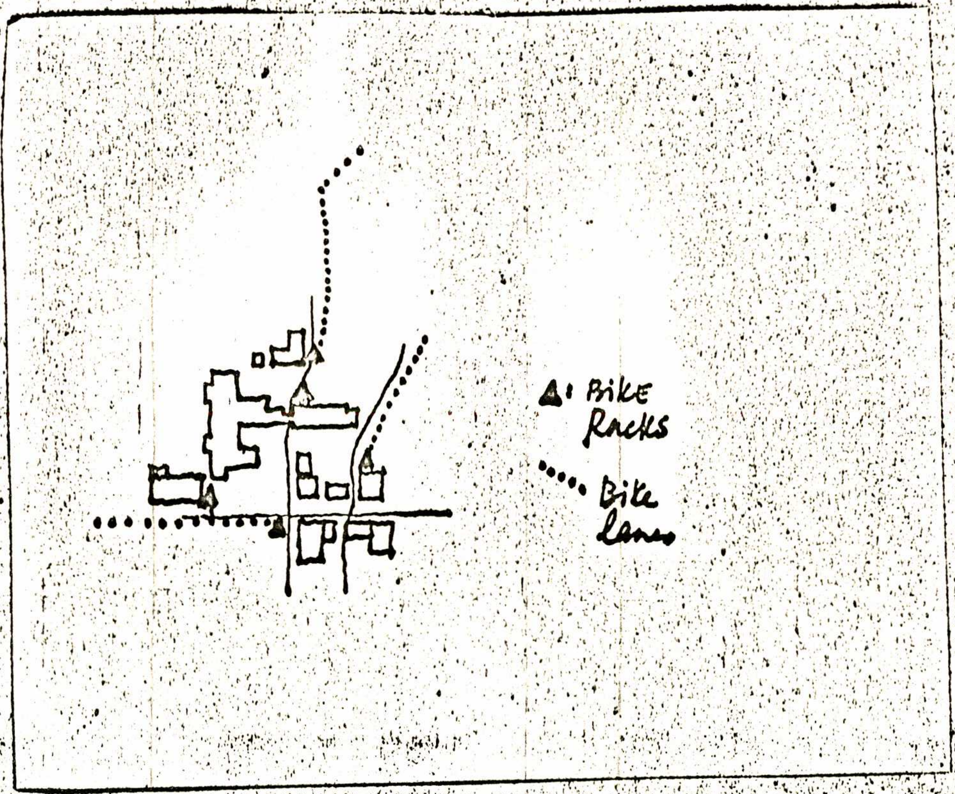
Draft

BIKE PATHS

The pattern is: Bike paths and racks.

Bike paths and racks: In the existing building there is a conflict. The bicycles are concentrated just where the pedestrians are concentrated - at the main arcade connecting the two wings of the building. And there are no bike paths, along the pedestrian paths and the roads.

We propose the following location of bike paths and racks. The paths to the north are intended to connect up to the bike paths that enter the campus between Prince Lucien Hall and the Library.



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ATHLETICS

The pattern is: Relax - leisure is a part of learning.

Relax: The location of the tennis courts helps to solve this problem. However, there is not enough of this kind of activity in the southwest of the campus. We have not yet completed our investigations of this pattern, and so we shall not make a formal proposal concerning it in this project.

Our current view is that the area beside the tennis court, beside the old Hudson House, should be developed with a small facility, including handball court, sauna, showers, etc.

Once we have established more clearly the campus-wide implications of this pattern, we shall have to revise this project.

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Economic analysis comparing our project proposal for the College of Education with the University's current project proposal.

Visually, the difference between the two proposals is so striking that it is hard to imagine that they are intended to fulfill needs that are even remotely similar. The current Education project, although only 2 and 3 stories high, seems enormous. Partly, this is due to the fact that is is joined with the Behavioral Science Complex to form a single very large building. Also, the various wings of the building enclose three large courtyards which are not apparent from outside the building and thus make it appear even larger than it actually is. The reinforced concrete structure and flat roofs give the building a massive, monolithic quality.

Our version is composed of a cluster of small buildings linked together with arcades and covered walks to partially enclose a series of garden courts. The buildings are all only 1 or 2 stories high, with pitched roofs and deep overhands following the general -character of the existing Education Building. The scale is that of a small village. The construction would be wood frame with possibly brick veneer. The general character would be rather light and open and non-institutional.

The existing Education Building would be used in both cases but in the current project no money was allocated to its remodeling and it would be removed or converted to other use as the second phase of the College of Education is built. Our version however, includes substantial remodeling and rehabilitation of the existing building with the intention that it would continue to be used by the College of Education on a permanent basis.

The siting of the buildings in our version does not require the removal of the Alder Street tennis courts and they would be continued in line with the pattern that calls for recreation

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space amongst academic buildings. Using the residual space around the existing Education Building makes it possible to add substantial building area without utilizing a major building site.

New construction in our version is actually smaller than the current Education project. In part, this is due to the fact that we have computed only <u>current</u> deficiencies in framing their space allocations - this follows our contention that projections of future needs tend to inflate building programs. Also, we propose to purchase the sorority house at the end of Kincaid Street and to convert it for use as office space for the College of Education. If this house is no longer available for purchase, an additional 5,000 square feet will have to be added as new construction.

The space assignments in our version were prepared without the benefit of advice from the College of Education or OPIR and are intended to be only indicative of their general approach. They propose somewhat smaller increases in area in each category of space except for classrooms which would be only slightly greater than the current Education proposal. In summary, our program reflects the emphasis on current needs (versus projected needs) and the gradualism inherent in the "piecemeal" approach.

	Area of Existing Facilities	Education Project Total Area	Education Project % Increases	CES Example Total Area	CES Example % Increases
Classrooms	4,542	9,797	115.6%	11,542	154.1%
Offices	33,463	50,503	50.9%	43,349	29.5%
Class Labs	1,867	4,754	154.6%	1,867	0
Research and Special Purpose	18,005	22,998	27.7%	19,563	9.6%
General	3,431	8,950	160.8%	7,103	107.0%
TOTAL NET ASSIGNABLE	61,312	97,002	58.2%	83,424	35.1%

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The cost of our project (including direct construction, rehabilitation of the existing building, acquisition of the sorority house and architects fee) would be $1,897,870. This is approximately $1,000,000 less than the current Education Project ($2.8 million). This is due to several factors: first, as has already been indicated, we have programmed a somewhat smaller net space increase; second, the acquisition of an existing sorority house would, if available, be less costly than an equivalent amount of new construction. On the other hand, our example includes $155,000 for rehabilitation and remodeling of the existing Education Building which is not included in the current Education Project.

The unit cost for direct construction (exclusive of architects fees) of the current Education Project is, according to the architects' estimate, $29.39/sq.ft., as opposed to $26.79/sq.ft. for our version. (According to our survey of building costs in the Willamette Valley, two story wood frame construction (schools and similar institutional buildings) was $24.75/sq.ft. in 1970. Increases due to inflation (approximately 8%) would bring this figure up to $26.75 for 1971.) This higher unit cost is accounted for primarily by the fact that the current Education Project is a different class of construction, i.e., reinforced concrete.

Another kind of comparison which takes the relative efficiency of the building designs into account, is the cost per square foot of net assignable area. For new construction, this would be $51.73/sq.ft. for the current Education Project versus $48.59/sq. ft. for our version.

However, we place a great deal of emphasis on the need to provide funds for continued maintenance and periodic remodeling of existing buildings, and we have also advocated the purchase of existing buildings in the community and their conversion to

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University use. Our project for the College of Education reflects both of these proposed policies. It can be argued that the money invested in rehabilitation and remodeling of the existing Education Building, and the money invested in purchase and remodeling of an existing building are both equivalent to money spent on adding new buildings to the campus, since they both add space, and increase the lifetime of the space.

If the areas and appropriate costs for these two items are added to the calculation of cost/net area our project would have a total unit cost of $32.57/sq.ft., compared with $51.73/sq.ft. for the current project.

The three kinds of comparison are summarized as follows:

	Current Education Project	Our Example Project
Unit cost per square foot of gross area (new construction)	$29.39	$26.75
Unit cost per square foot of net area (new construction)	51.73	44.58
Unit cost per square foot of net area (new construction plus purchase and remodeling existing buildings)	51.73	32.57

The differences in the physical characteristics of the two proposals are not merely stylistic. Rather, they stem from the differences in the fundamental assumptions underlying the basic programming in each instance. The current Education-Behavioral Science project is a classic example of the so-called "Large Lump Development". Our example is characteristic of what we propose as piecemeal growth.

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APPENDIX A

Summary of Comparisons of Projects as Outlined in A, B, and C Below

	Proposed New Building			Center for Environmental Structure Proposal		
New Construction:	Area - Sq. Ft.	Const. Cost/ Sq. Ft.	Const. & Fees Cost/ Sq. Ft.	Area - Sq. Ft.	Const. Cost/ Sq. Ft.	Const. & Fees Cost/ Sq. Ft.
Net Assignable Area	51,478	$51.73	$54.99	32,900	$44.58	$47.36
Architectural Gross	90,606	29.39	31.24	54,830	26.75	28.42

	Proposed New Building	Center for Environmental Structure Proposal
Direct Cost:		
New Construction	$ 2,663,120	$ 1,466,700
Architects Fees	167,440	91,670
Total New Construction	$ 2,830,560	$ 1,558,370
Rehabilitation of Existing Building Including Architects Fees	0	170,500
Purchase of Existing Sorority House, Remodeling, and Architects Fees	0	169,000
Total Project Cost	$ 2,830,560	$ 1,897,870

A. Summaries of Actual and Proposed Space Use for the College of Education

Summary of Existing College of Education Space, Spring 1971

	Existing Education Building	Clinical Services	Other Facilities	Total Area
Classrooms	2,768	1,774	0	4,542
Offices	12,298	8,651	12,518	33,467
Class Labs	1,867	0	0	1,867
Research and Special Purpose	1,463	13,600	2,942	18,005
General	1,964	1,139	328	3,431
TOTAL NET ASSIGNABLE	20,360	25,164	15,788	61,312

Summary of College of Education Space, Using Proposed New Building, Clinical Services, and Existing Education Building

	Existing Education Building (Includes Clinical Services)	New Construction	Other Facilities	Total Area	% Increase Over Existing Facilities
Classrooms	4,542	5,255	0	9,797	115.6%
Offices	20,949	29,544*	0	50,503	50.9%
Class Labs	1,867	2,887	0	4,754	154.6%
Research and Special Purpose	15,063	7,935	0	22,998	27.7%
General	3,103	5,847	0	8,950	160.8%
TOTAL NET ASSIGNABLE	45,524	51,578	0	97,002	58.2%

Summary of College of Education Space Using Center for Environmental Structure Proposal

	Existing Education Building (Includes Clinical Services)	New Construction	Other Facilities (Sorority Purchase or Additional Construction)	Total Area	% Increase Over Existing Facilities
Classrooms	4,542	7,000	0	11,542	154.1%
Offices	20,949	18,400	4,000	43,349	29.5%
Class Labs	1,867	0	0	1,867	0
Research and Special Purpose	15,063	4,500	0	19,563	9.6%
General	3,103	3,000	1,000	7,103	107.0%
TOTAL NET ASSIGNABLE	45,524	32,900	5,000	83,424	35.1%

*Includes 6,097 sq. ft. alternate.

B. Project Cost Analysis for the Actual Proposed New Building, Space and Cost Estimated Prorated to July 1971, Based Upon Architects' Estimates.

New Construction:

		Cost Per Sq. Ft.	
Net Assignable	51,487 sq. ft.	(51.73)	
Architectural Gross	90,606 sq. ft.	(29.39)	
Direct Construction Cost			$ 2,663,120
Architects fees - 6.25% of construction cost + $1,000 supplement			167,440
Project Cost: Direct construction cost plus architects fees			$ 2,830,560

C. Project Cost Analysis of the Center for Environmental Structure Proposal with Suggested Revisions by OPIR.

New Construction:

		Cost Per Sq. Ft.
Net Assignable	32,900 sq. ft.	(44.58)
Architectural Gross	54,830 sq. ft.	(26.75)

This assumes average direct construction cost for 2 story wood frame building of $24.75 in 1970, plus 8%, 1970-71 inflation is $26.75 per sq. ft.

Direct Construction Cost (1971)			$ 1,466,700
Acquisition of property (sorority house):			
Approximately 5,000 sq. ft. net assignable		$ 114,000	
Remodeling and repair		50,000	
Existing Education Building:			
Net Assignable (existing) 20,360			
2,500 sq. ft. remodeling	@ $30.00 per sq. ft.	75,000	
3,000 sq. ft. repair	@ $10.00 per sq. ft.	30,000	
Miscellaneous		50,000	
Direct existing building construction cost and cost of new acquisition			319,000
Architects fees 6.25% of $1,466,700			91,670
10% of 205,000			20,500