We begin with that part of the language which defines a town or a community. These patterns can never be "designed" or "built" in one fell swoop—but patient piecemeal growth, designed in such a way that every individual act is always helping to create or generate these larger global patterns, will, slowly and surely, over the years, make a community that has these global patterns in it.



The first 94 patterns deal with the large-scale structure of the environment: the growth of town and country, the layout of roads and paths, the relationship between work and family, the formation of suitable public institutions for a neighborhood, the kinds of public space required to support these institutions.

We believe that the patterns presented in this section can be implemented best by piecemeal processes, where each project built or each planning decision made is sanctioned by the community according as it does or does not help to form certain large-scale patterns. We do not believe that these large patterns, which give so much structure to a town or of a neighborhood, can be created by centralized authority, or by laws, or by master plans. We believe instead that they can emerge gradually and organically, almost of their own accord, if every act of building, large or small, takes on the responsibility for gradually shaping its small corner of the world to make these larger patterns appear there.

In the next few pages we shall describe a planning

TOWNS

process which we believe is compatible with this piecemeal approach.

1. The core of the planning process we propose is this: The region is made up of a hierarchy of social and political groups, from the smallest and most local groups—families, neighborhoods, and work groups—to the largest groups—city councils, regional assemblies.

Imagine for example a metropolitan region composed very roughly of the following groups, each group a coherent political entity:

- A. The region: 8,000,000 people.
- B. The major city: 500,000 people.
- C. Communities and small towns: 5–10,000 people each.
- D. Neighborhoods: 500-1000 people each.
- E. House clusters and work communities: 30–50 people each.
- F. Families and work groups: 1-15 people each.
- 2. Each group makes its own decisions about the environment it uses in common. Ideally, each group actually owns the common land at its "level." And higher groups do not own or control the land belonging to lower groups—they only own and control the common land that lies between them, and which serves the higher group. For instance, a community of 7000 might own the public land lying between its component neighborhoods, but not the neighborhoods themselves. A cooperative house cluster would own the common land between the houses, but not the houses themselves.
- 3. Each of these groups takes responsibility for those patterns relevant to its own internal structure.

Thus, we imagine, for example, that the various

TOWNS

groups we have named might choose to adopt the following patterns:

A. Region: INDEPENDENT REGIONS

DISTRIBUTION OF TOWNS

CITY COUNTRY FINGERS . . .

B. City: Mosaic of subcultures

SCATTERED WORK

THE MAGIC OF THE CITY . . .

C. Community: COMMUNITY OF 7000

SUBCULTURE BOUNDARY . . .

4. Each neighborhood, community, or city is then free to find various ways of persuading its constituent groups and individuals to implement these patterns gradually.

In every case this will hinge on some kind of incentive. However, the actual incentives chosen might vary greatly, in their power, and degree of enforcement. Some patterns, like CITY COUNTRY FINGERS, might be made a matter of regional law—since nothing less can deter money-hungry developers from building everywhere. Other patterns, like MAIN GATEWAY, BIRTH PLACES, STILL WATER, might be purely voluntary. And other patterns might have various kinds of incentives, intermediate between these extremes.

For example, NETWORK OF PATHS AND CARS, ACCESSIBLE GREENS, and others might be formulated so that tax breaks will be given to those development projects which help to bring them into existence.

5. As far as possible, implementation should be loose and voluntary, based on social responsibility, and not on legislation or coercion.

Suppose, for example, that there is a citywide decision

to increase industrial uses in certain areas. Within the process here defined, the city could not implement this policy over the heads of the neighborhoods, by zoning or the power of eminent domain or any other actions. They can suggest that it is important, and can increase the flow of money to any neighborhoods willing to help implement this larger pattern. They can implement it, in short, if they can find local neighborhoods willing to see their own future in these terms, and willing to modify their own environment to help make it happen locally. As they find such neighborhoods, then it will happen gradually, over a period of years, as the local neighborhoods respond to the incentives.

- 6. Once such a process is rolling, a community, having adopted the pattern health center, for example, might invite a group of doctors to come and build such a place. The team of users, designing the clinic would work from the health center pattern, and all the other relevant patterns that are part of the community's language. They would try to build into their project any higher patterns that the community has adopted—nine per cent parking, local sports, network of paths and cars, accessible green, etc.
- 7. It is of course possible for individual acts of building to begin working their way toward these larger communal patterns, even before the neighborhood, community, and regional groups are formed.

Thus, for example, a group of people seeking to get rid of noisy and dangerous traffic in front of their houses might decide to tear up the asphalt, and build a GREEN STREET there instead. They would present their case to

the traffic department based on the arguments presented in the pattern, and on an analysis of the existing street pattern.

Another group wanting to build a small communal workshop, in a neighborhood currently zoned for residential use only, can argue their case based on SCATTERED WORK, SETTLED WORK, etc., and possibly get the city or zoning department to change the zoning regulation on this matter, and thereby slowly work toward introducing patterns, one at a time within the current framework of codes and zoning.

We have worked out a partial version of this process at the Eugene campus of the University of Oregon. That work is described in Volume 3, The Oregon Experiment. But a university is quite different from a town, because it has a single centralized owner, and a single source of funds. It is inevitable, therefore, that the process by which individual acts can work together to form larger wholes without restrictive planning from above, can only partly be put into practice there.

The theory which explains how large patterns can be built piecemeal from smaller ones, is given in Chapters 24 and 25 of The Timeless Way of Building.

At some time in the future, we hope to write another volume, which explains the political and economic processes needed to implement this process fully, in a town.

Do what you can to establish a world government, with a thousand independent regions, instead of countries;

I. INDEPENDENT REGIONS

I INDEPENDENT REGIONS**



Metropolitan regions will not come to balance until each one is small and autonomous enough to be an independent sphere of culture.

There are four separate arguments which have led us to this conclusion: I. The nature and limits of human government. 2. Equity among regions in a world community. 3. Regional planning considerations. 4. Support for the intensity and diversity of human cultures.

- 1. There are natural limits to the size of groups that can govern themselves in a human way. The biologist J. B. S. Haldane has remarked on this in his paper, "On Being the Right Size":
- ... just as there is a best size for every animal, so the same is true for every human institution. In the Greek type of democracy all the citizens could listen to a series of orators and vote directly on questions of legislation. Hence their philosophers held that a small city was the largest possible democratic state. . . (J. B. S. Haldane, "On Being the Right Size," The World of Mathematics, Vol. II, J. R. Newman, ed. New York: Simon and Schuster, 1956, pp. 962-67).

It is not hard to see why the government of a region becomes less and less manageable with size. In a population of N persons, there are of the order of N² person-to-person links needed to keep channels of communication open. Naturally, when N goes beyond a certain limit, the channels of communication needed for democracy and justice and information are simply too clogged, and too complex; bureaucracy overwhelms human processes.

And, of course, as N grows the number of levels in the hierarchy of government increases too. In small countries like Denmark there are so few levels, that any private citizen can have access to the Minister of Education. But this kind of direct access is quite impossible in larger countries like England or the United States.

We believe the limits are reached when the population of a region reaches some 2 to 10 million. Beyond this size, people become remote from the large-scale processes of government. Our estimate may seem extraordinary in the light of modern history: the nation-states have grown mightily and their governments hold power over tens of millions, sometimes hundreds of millions, of people. But these huge powers cannot claim to have a natural size.

TOWNS

They cannot claim to have struck the balance between the needs of towns and communities, and the needs of the world community as a whole. Indeed, their tendency has been to override local needs and repress local culture, and at the same time aggrandize themselves to the point where they are out of reach, their power barely conceivable to the average citizen.

2. Unless a region has at least several million people in it, it will not be large enough to have a seat in a world government, and will therefore not be able to supplant the power and authority of present nation-states.

We found this point expressed by Lord Weymouth of Warminster, England, in a letter to the *New York Times*, March 15, 1973:

WORLD FEDERATION: A THOUSAND STATES

. . . the essential foundation stone for world federation on a democratic basis consists of regionalization within centralized government. . . . This argument rests on the idea that world government is lacking in moral authority unless each delegate represents an approximately equal portion of the world's population. Working backward from an estimate of the global population in the year 2000, which is anticipated to rise to the 10,000 million mark, I suggest that we should be thinking in terms of an ideal regional state at something around ten million, or between five and fifteen million, to give greater flexibility. This would furnish the U.N. with an assembly of equals of 1000 regional representatives: a body that would be justified in claiming to be truly representative of the world's population.

Weymouth believes that Western Europe could take some of the initiative for triggering this conception of world government. He looks for the movement for regional autonomy to take hold in the European Parliament at Strasbourg; and hopes that power can gradually be transferred from Westminister, Paris, Bonn, etc., to regional councils, federated in Strasbourg.

I am suggesting that in the Europe of the future we shall see England split down into Kent, Wessex, Mercia, Anglia and Northumbria, with an independent Scotland, Wales and Ireland, of course. Other European examples will include Brittany, Bavaria and Calabria. The national identities of our contemporary Europe will have lost their political significance.

3. Unless the regions have the power to be self-governing, they

I INDEPENDENT REGIONS

will not be able to solve their own environmental problems. The arbitrary lines of states and countries, which often cut across natural regional boundaries, make it all but impossible for people to solve regional problems in a direct and humanly efficient way.

An extensive and detailed analysis of this idea has been given by the French economist Gravier, who has proposed, in a series of books and papers, the concept of a Europe of the Regions, a Europe decentralized and reorganized around regions which cross present national and subnational boundaries. (For example, the Basel-Strasbourg Region includes parts of France, Germany, and Switzerland; the Liverpool Region includes parts of England and parts of Wales). See Jean-François Gravier, "L'Europe des regions," in 1965 Internationale Regio Planertagung, Schriften der Regio 3, Regio, Basel, 1965, pp. 211–22; and in the same volume see also Emrys Jones, "The Conflict of City Regions and Administrative Units in Britain," pp. 223–35.

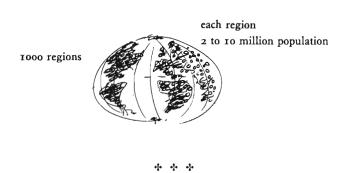
4. Finally, unless the present-day great nations have their power greatly decentralized, the beautiful and differentiated languages, cultures, customs, and ways of life of the earth's people, vital to the health of the planet, will vanish. In short, we believe that independent regions are the natural receptacles for language, culture, customs, economy, and laws and that each region should be separate and independent enough to maintain the strength and vigor of its culture.

The fact that human cultures within a city can only flourish when they are at least partly separated from neighboring cultures is discussed in great detail in MOSAIC OF SUBCULTURES (8). We are suggesting here that the same argument also applies to regions—that the regions of the earth must also keep their distance and their dignity in order to survive as cultures.

In the best of medieval times, the cities performed this function. They provided permanent and intense spheres of cultural influence, variety, and economic exchange; they were great communes, whose citizens were co-members, each with some say in the city's destiny. We believe that the independent region can become the modern polis—the new commune—that human entity which provides the sphere of culture, language, laws, services, economic exchange, variety, which the old walled city or the polis provided for its members.

Therefore:

Wherever possible, work toward the evolution of independent regions in the world; each with a population between 2 and 10 million; each with its own natural and geographic boundaries; each with its own economy; each one autonomous and self-governing; each with a seat in a world government, without the intervening power of larger states or countries.

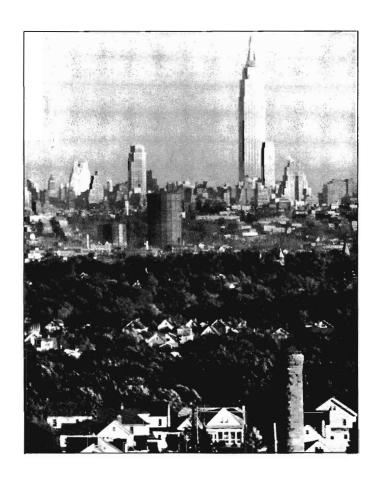


Within each region encourage the population to distribute itself as widely as possible across the region—The distribution of towns (2). . . .

within each region work toward those regional policies which will protect the land and mark the limits of the cities:

- 2. THE DISTRIBUTION OF TOWNS
- 3. CITY COUNTRY FINGERS
- 4. AGRICULTURAL VALLEYS
- 5. LACE OF COUNTRY STREETS
- 6. COUNTRY TOWNS
- 7. THE COUNTRYSIDE

2 THE DISTRIBUTION OF TOWNS



. . . consider now the character of settlements within the region: what balance of villages, towns, and cities is in keeping with the independence of the region—INDEPENDENT REGIONS (1)?



If the population of a region is weighted too far toward small villages, modern civilization can never emerge; but if the population is weighted too far toward big cities, the earth will go to ruin because the population isn't where it needs to be, to take care of it.

Two different necessities govern the distribution of population in a region. On the one hand, people are drawn to cities: they are drawn by the growth of civilization, jobs, education, economic growth, information. On the other hand, the region as a social and ecological whole will not be properly maintained unless the people of the region are fairly well spread out across it, living in many different kinds of settlements—farms, villages, towns, and cities—with each settlement taking care of the land around it. Industrial society has so far been following only the first of these necessities. People leave the farms and towns and villages and pack into the cities, leaving vast parts of the region depopulated and undermaintained.

In order to establish a reasonable distribution of population within a region, we must fix two separate features of the distribution: its statistical character and its spatial character. First, we must be sure that the statistical distribution of towns, by size, is appropriate: we must be sure that there are many small towns and few large ones. Second, we must then be sure that the spatial distribution of towns within the region is appropriate: we must be sure that the towns in any given size category are evenly spread out across the region, not highly concentrated.

In practice, the statistical distribution will take care of itself. A large number of studies has shown that the natural demographic and political and economic processes at work in city growth and population movement will create a distribution of

towns with many small towns and few large ones; and indeed, the nature of this distribution does correspond, roughly, to the logarithmic distribution that we propose in this pattern. Various explanations have been given by Christaller, Zipf, Herbert Simon, and others; they are summarized in Brian Berry and William Garrison, "Alternate Explanations of Urban Rank-Size Relationships," Annals of the Association of American Geographers, Vol. 48, March 1958, No. 1, pp. 83-91.

Let us assume, then, that towns will have the right distribution of sizes. But are they adjacent to one another, or are they spread out? If all the towns in a region, large, medium, and small, were crammed together in one continuous urban area, the fact that some are large and some are small, though interesting politically, would have no ecological meaning whatsoever. As far as the ecology of the region is concerned, it is the *spatial* distribution of the towns which matters, not the statistics of political boundaries within the urban sprawl.

Two arguments have led us to propose that the towns in any one size category should be uniformly distributed across the region: an economic argument and an ecological argument.

Economic. All over the world, underdeveloped areas are facing economic ruin because the jobs, and then the people, move toward the largest cities, under the influence of their economic gravity. Sweden, Scotland, Israel, and Mexico are all examples. The population moves toward Stockholm, Glasgow, Tel Aviv, Mexico City—as it does so, new jobs get created in the city, and then even more people have to come to the city in search of jobs. Gradually the imbalance between city and country becomes severe. The city becomes richer, the outlying areas continuously poorer. In the end the region may have the highest standard of living in the world at its center, yet only a few miles away, at its periphery, people may be starving.

This can only be halted by policies which guarantee an equal sharing of resources, and economic development, across the entire region. In Israel, for example, there has been some attempt to pour the limited resources with which the government can subsidize economic growth into those areas which are most backward economically. (See "Urban Growth Policies in Six

THE DISTRIBUTION OF TOWNS

European Countries," Urban Growth Policy Study Group, Office of International Affairs, HUD, Washington, D.C., 1972.)

Ecological. An overconcentrated population, in space, puts a huge burden on the region's overall ecosystem. As the big cities grow, the population movement overburdens these areas with air pollution, strangled transportation, water shortages, housing shortages, and living densities which go beyond the realm of human reasonableness. In some metropolitan centers, the ecology is perilously close to cracking. By contrast, a population that is spread more evenly over its region minimizes its impact on the ecology of the environment, and finds that it can take care of itself and the land more prudently, with less waste and more humanity:

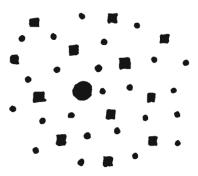
This is because the actual urban superstructure required per inhabitant goes up radically as the size of the town increases beyond a certain point. For example, the per capita cost of high rise flats is much greater than that of ordinary houses; and the cost of roads and other transportation routes increases with the number of commuters carried. Similarly, the per capita expenditure on other facilities such as those for distributing food and removing wastes is much higher in cities than in small towns and villages. Thus, if everybody lived in villages the need for sewage treatment plants would be somewhat reduced, while in an entirely urban society they are essential, and the cost of treatment is high. Broadly speaking, it is only by decentralization that we can increase self-sufficiency—and self-sufficiency is vital if we are to minimize the burden of social systems on the ecosystems that support them. The Ecologist, Blueprint for Survival, England: Penguin, 1972, pp. 52-53.)

Therefore:

Encourage a birth and death process for towns within the region, which gradually has these effects:

- 1. The population is evenly distributed in terms of different sizes—for example, one town with 1,000,000 people, 10 towns with 100,000 people each, 100 towns with 10,000 people each, and 1000 towns with 100 people each.
- 2. These towns are distributed in space in such a way that within each size category the towns are homogeneously distributed all across the region.

This process can be implemented by regional zoning policies, land grants, and incentives which encourage industries to locate according to the dictates of the distribution.

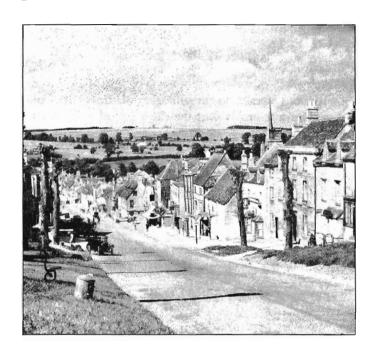


towns of 1,000,000 – 250 miles apart towns of 100,000 – 80 miles apart towns of 10,000 – 25 miles apart towns of 1,000 – 8 miles apart



As the distribution evolves, protect the prime agricultural land for farming—AGRICULTURAL VALLEYS (4); protect the smaller outlying towns, by establishing belts of countryside around them and by decentralizing industry, so that the towns are economically stable—country towns (6). In the larger more central urban areas work toward land policies which maintain open belts of countryside between the belts of city—CITY COUNTRY FINGERS (3). . .

3 CITY COUNTRY FINGERS**



. . . the distribution of towns required to make a balanced region—distribution of towns (2)—can be further helped by controlling the balance of urban land and open countryside within the towns and cities themselves.



Continuous sprawling urbanization destroys life, and makes cities unbearable. But the sheer size of cities is also valuable and potent.

People feel comfortable when they have access to the country-side, experience of open fields, and agriculture; access to wild plants and birds and animals. For this access, cities must have boundaries with the countryside near every point. At the same time, a city becomes good for life only when it contains a great density of interactions among people and work, and different ways of life. For the sake of this interaction, the city must be continuous—not broken up. In this pattern we shall try to bring these two facts to balance.

Let us begin with the fact that people living in cities need contact with true rural land to maintain their roots with the land that supports them. A 1972 Gallup poll gives very strong evidence for this fact. The poll asked the question: "If you could live anywhere, would you prefer a city, suburban area, small town, or farm?" and received the following answers from 1465 Americans:

City	13%
Suburb	13
Small town	32
Farm	23

And this dissatisfaction with cities is getting worse. In 1966, 22 percent said they preferred the city—in 1972, only six years later, this figure dropped to 13 percent. ("Most don't want to live in a city," George Gallup, San Francisco Chronicle, Monday, December 18, 1972, p. 12.)

It is easy to understand why city people long for contact with

3 CITY COUNTRY FINGERS

the countryside. Only 100 years ago 85 percent of the Americans lived on rural land; today 70 percent live in cities. Apparently we cannot live entirely within cities—at least the kinds of cities we have built so far—our need for contact with the countryside runs too deep, it is a biological necessity:

Unique as we may think we are, we are nevertheless as likely to be genetically programmed to a natural habitat of clean air and a varied green landscape as any other mammal. To be relaxed and feel healthy usually means simply allowing our bodies to react in the way for which one hundred millions of years of evolution has equipped us. Physically and genetically, we appear best adapted to a tropical savanna, but as a cultural animal we utilize learned adaptations to cities and towns. For thousands of years we have tried in our houses to imitate not only the climate, but the setting of our evolutionary past: warm, humid air, green plants, and even animal companions. Today, if we can afford it, we may even build a greenhouse or swimming pool next to our living room, buy a place in the country, or at least take our children vacationing on the seashore. The specific physiological reactions to natural beauty and diversity, to the shapes and colors of nature (especially to green), to the motions and sounds of other animals, such as birds, we as yet do not comprehend. But it is evident that nature in our daily life should be thought of as a part of the biological need. It cannot be neglected in the discussions of resource policy for man. (H. H. Iltis, P. Andres, and O. L. Loucks, in Population Resources Environment: Issues in Human Ecology, P. R. Ehrlich and A. H. Ehrlich, San Francisco: Freeman and Co., 1970, p. 204.)

But it is becoming increasingly difficult for city dwellers to come into contact with rural life. In the San Francisco Bay Region 21 square miles of open space is lost each year (Gerald D. Adams, "The Open Space Explosion," Cry California, Fall 1970, pp. 27–32.) As cities get bigger the rural land is farther and farther away.

With the breakdown of contact between city dwellers and the countryside, the cities become prisons. Farm vacations, a year on the farm for city children, and retirement to the country for old people are replaced by expensive resorts, summer camps, and retirement villages. And for most, the only contact remaining is the weekend exodus from the city, choking the highways and the few organized recreation centers. Many weekenders return to the city on Sunday night with their nerves more shattered than when they left.

TOWNS



When the countryside is far away the city becomes a prison.

If we wish to re-establish and maintain the proper connection between city and country, and yet maintain the density of urban interactions, it will be necessary to stretch out the urbanized area into long sinuous fingers which extend into the farmland, shown in the diagram below. Not only will the city be in the form of narrow fingers, but so will the farmlands adjacent to it.

The maximum width of the city fingers is determined by the maximum acceptable distance from the heart of the city to the countryside. We reckon that everyone should be within 10 minutes' walk of the countryside. This would set a maximum width of 1 mile for the city fingers.

The minimum for any farmland finger is determined by the minimum acceptable dimensions for typical working farms. Since 90 percent of all farms are still 500 acres or less and there is no respectable evidence that the giant farm is more efficient (Leon H. Keyserling, Agriculture and the Public Interest, Conference on Economic Progress, Washington, D. C., February 1965), these fingers of farmland need be no more than I mile wide.

The implementation of this pattern requires new policies of three different kinds. With respect to the farmland, there must be policies encouraging the reconstruction of small farms, farms that fit the one-mile bands of country land. Second, there must be policies which contain the cities' tendency to scatter in every direction. And third, the countryside must be truly public, so that people can establish contact with even those parts of the land that are under private cultivation.

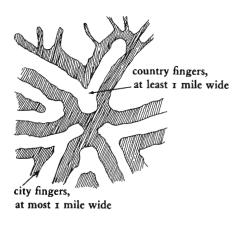
Imagine how this one pattern would transform life in cities.

3 CITY COUNTRY FINGERS

Every city dweller would have access to the countryside; the open country would be a half-hour bicycle ride from downtown.

Therefore:

Keep interlocking fingers of farmland and urban land, even at the center of the metropolis. The urban fingers should never be more than I mile wide, while the farmland fingers should never be less than I mile wide.





Whenever land is hilly, keep the country fingers in the valleys and the city fingers on the upper slopes of hillsides—AGRICUL-TURAL VALLEYS (4). Break the city fingers into hundreds of distinct self-governing subcultures—Mosaic of subcultures (8), and run the major roads and railways down the middle of these city fingers—WEB OF PUBLIC TRANSPORTATION (16), RING ROADS (17). . . .

4 AGRICULTURAL VALLEYS*



... this pattern helps maintain the INDEPENDENT REGIONS (I) by making regions more self-sufficient agriculturally; and it will create CITY COUNTRY FINGERS (3) almost automatically by preserving agricultural land in urban areas. But just exactly which land ought to be preserved, and which land built upon?

* * *

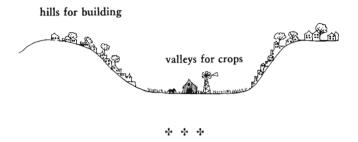
The land which is best for agriculture happens to be best for building too. But it is limited—and once destroyed, it cannot be regained for centuries.

In the last few years, suburban growth has been spreading over all land, agricultural or not. It eats up this limited resource and, worse still, destroys the possibility of farming close to cities once and for all. But we know, from the arguments of CITY COUNTRY FINGERS (3), that it is important to have open farmland near the places where people live. Since the arable land which can be used for farming lies mainly in the valleys, it is essential that the valley floors within our urban regions be left untouched and kept for farming.

The most complete study of this problem that we know, comes from Ian McHarg (Design With Nature, New York: Natural History Press, 1969). In his "Plan for the Valleys" (Wallace-McHarg Associates, Philadelphia, 1963), he shows how town development can be diverted to the hillsides and plateaus, leaving the valleys clear. The pattern is supported, also, by the fact that there are several possible practical approaches to the task of implementation (McHarg, pp. 79–93).

Therefore:

Preserve all agricultural valleys as farmland and protect this land from any development which would destroy or lock up the unique fertility of the soil. Even when valleys are not cultivated now, protect them: keep them for farms and parks and wilds.



Keep town and city development along the hilltops and hill-sides—CITY COUNTRY FINGERS (3). And in the valleys, treat the ownership of the land as a form of stewardship, embracing basic ecological responsibilities—THE COUNTRYSIDE (7). . . .

5 LACE OF COUNTRY STREETS



. . . according to the pattern CITY COUNTRY FINGERS (3), there is a rather sharp division between city land and rural land. But at the ends of city fingers, where the country fingers open out, there is a need for an additional kind of structure. This structure has traditionally been the suburbs. But. . .



The suburb is an obsolete and contradictory form of human settlement.

Many people want to live in the country; and they also want to be close to a large city. But it is geometrically impossible to have thousands of small farms, within a few minutes of a major city center.

To live well in the country, you must have a reasonable piece of land of your own—large enough for horses, cows, chickens, an orchard—and you must have immediate access to continuous open countryside, as far as the eye can see. To have quick access to the city, you must live on a road, within a few minutes' drive from city centers, and with a bus line outside your door.

It is possible to have both, by arranging country roads around large open squares of countryside or farmland, with houses closely packed along the road, but only one house deep. Lionel March lends support to this pattern in his paper, "Homes beyond the Fringe" (Land Use and Built Form Studies, Cambridge, England, 1968). March shows that such a pattern, fully developed, could work for millions of people even in a country as small and densely populated as England.

A "lace of country streets" contains square miles of open countryside, fast roads from the city at the edge of these square miles, houses clustered along the roads, and footpaths stretching out from the city, crisscrossing the countryside.

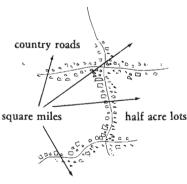
I. Square miles of open countrysics. We believe that one square mile is the smallest piece of open land which still maintains the integrity of the countryside. This figure is derived from the requirements of small farms, presented in the argument for CITY COUNTRY FINGERS (3).

5 LACE OF COUNTRY STREETS

- 2. Roads. To protect the countryside from suburban encroachment, the roads running out into the countryside must be vastly reduced in number. A loose network of interconnected roads, at one-mile intervals with little encouragement for throughtraffic to pass through them, is quite enough.
- 3. Lots. Situate homesteads, houses, and cottages along these country roads one or two lots deep, always setting them off the road with the open land behind them. The *minimum* land for a homestead must be approximately one-half acre to allow for basic farming. However, some of the housing could be in rows or clusters, with people working the land behind collectively. Assuming one-half acre lots around a one mile square of open land, we can have 400 households to the square mile. With four people per household, that is 1600 people per square mile; not very different from an ordinary low density suburb.
- 4. Footpaths. The countryside can be made accessible to city people by means of footpaths and trails running from the edge of the city and from the country roads into the countryside, across the squares of open land.

Therefore:

In the zone where city and country meet, place country roads at least a mile apart, so that they enclose squares of countryside and farmland at least one square mile in area. Build homesteads along these roads, one lot deep, on lots of at least half an acre, with the square mile of open countryside or farmland behind the houses.



TOWNS



Make each square mile of countryside, both farm and park, open to the public—THE COUNTRYSDE (7); arrange the half acre lots to form clusters of houses and neighborhoods, even when they are rather spread out—IDENTIFIABLE NEIGHBORHOOD (14), HOUSE CLUSTER (37). . . .

6 COUNTRY TOWNS*



. . . this pattern forms the backbone of the DISTRIBUTION OF TOWNS (2), which requires that scores of smaller country towns support the larger towns and cities of the region.



The big city is a magnet. It is terribly hard for small towns to stay alive and healthy in the face of central urban growth.

During the last 30 years, 30 million rural Americans have been forced to leave their farms and small towns and migrate to crowded cities. This forced migration continues at the rate of 800,000 people a year. The families that are left behind are not able to count on a future living in the country: about half of them live on less than \$3000 a year.

And it is not purely the search for jobs that has led people away from small towns to the cities. It is also a search for information, for connection to the popular culture. In Ireland and India, for example, lively people leave the villages where there is some work, and some little food, and they go to the city, looking for action, for better work, for a better life.

Unless steps are taken to recharge the life of country towns, the cities will swamp those towns which lie the nearest to them; and will rob those which lie furthest out of their most vigorous inhabitants. What are the possibilities?

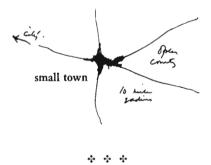
- 1. Economic reconstruction. Incentives to business and industry to decentralize and locate in small towns. Incentives to the inhabitants of small towns to begin grassroots business and production ventures. (See, for example, the bill introduced by Joe Evins in the House of Representatives, Congressional Record—House, October 3, 1967, 27687.)
- 2. Zoning. Zoning policy to protect small towns and the countryside around them. Greenbelt zoning was defined by Ebenezer Howard at the turn of the century and has yet to be taken seriously by American governments.
 - 3. Social services. There are connections between small towns

6 COUNTRY TOWNS

and cities that take the form of social services, that are irreplaceable: small town visits, farm weekends and vacations for city dwellers, schools and camps in the countryside for city children, small town retirement for old people who do not like the pace of city life. Let the city invite small towns to provide these services, as grassroots ventures, and the city, or private groups, will pay for the cost of the service.

Therefore:

Preserve country towns where they exist; and encourage the growth of new self-contained towns, with populations between 500 and 10,000, entirely surrounded by open countryside and at least 10 miles from neighboring towns. Make it the region's collective concern to give each town the wherewithal it needs to build a base of local industry, so that these towns are not dormitories for people who work in other places, but real towns—able to sustain the whole of life.



Treat each of these small towns as a political community, with full provision for all the stages of human life—community of 7000 (12), LIFE CYCLE (26). Treat the belt of open country which surrounds the town as farm land which belongs to the people and can be freely used by them—THE COUNTRYSIDE (7)...

7 THE COUNTRYSIDE*



... within each region, in between the towns, there are vast areas of countryside—farmland, parkland, forests, deserts, grazing meadows, lakes, and rivers. The legal and ecological character of this countryside is crucial to the balance of the region. When properly done, this pattern will help to complete THE DISTRIBUTION OF TOWNS (2), CITY COUNTRY FINGERS (3), AGRICULTURAL VALLEYS (4), LACE OF COUNTRY STREETS (5) and COUNTRY TOWNS (6).



I conceive that land belongs for use to a vast family of which many are dead, few are living, and countless members are still unborn.

-a Nigerian tribesman

Parks are dead and artificial. Farms, when treated as private property, rob the people of their natural biological heritage—the countryside from which they came.



Property is theft

In Norway, England, Austria, it is commonly understood that people have a right to picnic in farmland, and walk and play—provided they respect the animals and crops. And the reverse is also true—there is no wilderness which is abandoned to its own processes—even the mountainsides are terraced, mown, and grazed and cared for.

We may summarize these ideas by saying that there is only one kind of nonurban land—the countryside. There are no parks;

no farms; no uncharted wilderness. Every piece of countryside has keepers who have the right to farm it, if it is arable; or the obligation to look after it, if it is wild; and every piece of land is open to the people at large, provided they respect the organic processes which are going on there.

The central conception behind this view of the land is given by Aldo Leopold in his essay, "The Land Ethic" (A Sand County Almanac, New York: Oxford University Press, 1949); Leopold believes that our relationship to the land will provide the framework for the next great ethical transformation in the human community:

This extension of ethics, so far studied only by philosophers, is actually a process in ecological evolution. Its sequences may be described in ecological as well as in philosophical terms. An ethic, ecologically, is a limitation on freedom of action in the struggle for existence. An ethic, philosophically, is a differentiation of social from anti-social conduct. These are two definitions of one thing. The thing has its origin in the tendency of interdependent individuals or groups to evolve modes of co-operation. The ecologist calls these symbioses. Politics and economics are advanced symbioses in which the original free-for-all competition has been replaced, in part, by co-operative mechanisms with an ethical content. . . .

All ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts. His instincts prompt him to compete for his place in that community, but his ethics prompt him also to co-operate. . . .

The land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land. . . .

Within the framework of this ethic, parks and campgrounds conceived as "pieces of nature" for people's recreation, without regard for the intrinsic value of the land itself, are dead things and immoral. So also are farms conceived as areas "owned" by the farmers for their own exclusive profit. If we continue to treat the land as an instrument for our enjoyment, and as a source of economic profit, our parks and camps will become more artificial, more plastic, more like Disneyland. And our farms will become more and more like factories. The land ethic replaces the idea of public parks and public campgrounds with the concept of a single countryside.

7 THE COUNTRYSIDE

One example of support for this idea lies in the Blueprint for Survival, and the proposal there to give traditional communities stewardship over certain estuaries and marshes. These wetlands are the spawning grounds for the fish and shellfish which form the base of the food chain for 60 per cent of the entire ocean harvest, and they can only be properly managed by a group who respects them as a cooperating part in the chain of life. (The Ecologist, England: Penguin, 1972, p. 41.)

The residential forests of Japan provide another example. A village grows up along the edge of a forest; the villagers tend the forest. Thinning it properly is one of their responsibilities. The forest is available to anyone who wants to come there and partake in the process:

The farmhouses of Kurume-machi stand in a row along the main road for about a mile. Each house is surrounded by a belt of trees of similar species, giving the aspect of a single large forest. The main trees are located so as to produce a shelter-belt. In addition, these small forests are homes for birds, a device for conserving water, a source of firewood and timber, which is selectively cut, and a means of climate control, since the temperature inside the residential forest is cooler in summer and warmer in winter.

It should be noted that these residential forests, established more than 300 years ago, are still intact as a result of the careful selective cutting and replacement program followed by the residents. (John L. Creech, "Japan—Like a National Park," Yearbook of Agriculture 1963, U. S. Department of Agriculture, pp. 525-28.)

Therefore:

Define all farms as parks, where the public has a right to be; and make all regional parks into working farms.

Create stewardships among groups of people, families and cooperatives, with each stewardship responsible for one part of the countryside. The stewards are given a lease for the land, and they are free to tend the land and set ground rules for its use—as a small farm, a forest, marshland, desert, and so forth. The public is free to visit the land, hike there, picnic, explore, boat, so long as they conform to the ground rules. With such a setup, a farm near a city might have picnickers in its fields every day during the summer.





Within each natural preserve, we imagine a limited number of houses—House cluster (37)—with access on unpaved country lanes—GREEN STREETS (51)...

through city policies, encourage the piecemeal formation of those major structures which define the city:

- 8. MOSAIC OF SUBCULTURES
- 9. SCATTERED WORK
- IO. MAGIC OF THE CITY
- II. LOCAL TRANSPORT AREAS

8 mosaic of subcultures**



. . . the most basic structure of a city is given by the relation of urban land to open country—CITY COUNTRY FINGERS (3). Within the swaths of urban land the most important structure must come from the great variety of human groups and subcultures which can co-exist there.



The homogeneous and undifferentiated character of modern cities kills all variety of life styles and arrests the growth of individual character.

Compare three possible alternative ways in which people may be distributed throughout the city:

1. In the heterogeneous city, people are mixed together, irrespective of their life style or culture. This seems rich. Actually it dampens all significant variety, arrests most of the possibilities for differentiation, and encourages conformity. It tends to reduce all life styles to a common denominator. What appears heterogeneous turns out to be homogeneous and dull.



The heterogeneous city.

2. In a city made up of ghettos, people have the support of the most basic and banal forms of differentiation—race or economic status. The ghettos are still homogeneous internally, and



City of ghettos.

TOWNS

do not allow a significant variety of life styles to emerge. People in the ghetto are usually forced to live there, isolated from the rest of society, unable to evolve their way of life, and often intolerant of ways of life different from their own.

3. In a city made of a large number of subcultures relatively small in size, each occupying an identifiable place and separated from other subcultures by a boundary of nonresidential land, new ways of life can develop. People can choose the kind of subculture they wish to live in, and can still experience many ways of life different from their own. Since each environment fosters mutual support and a strong sense of shared values, individuals can grow.



Mosaic of subcultures.

This pattern for a mosaic of subcultures was originally proposed by Frank Hendricks. His latest paper dealing with it is "Concepts of environmental quality standards based on life styles," with Malcolm MacNair (Pittsburg, Pennsylvania: University of Pittsburgh, February 1969). The psychological needs which underlie this pattern and which make it necessary for subcultures to be spatially separated in order to thrive have been described by Christopher Alexander, "Mosaic of Subcultures," Center for Environmental Structure, Berkeley, 1968. The following statement is an excerpt from that paper.

I.

We are the hollow men, We are the stuffed men. Leaning together Headpiece filled with straw. Alas.

Shape without form, shade without color, Paralyzed force, gesture without motion;

8 MOSAIC OF SUBCULTURES

Many of the people who live in metropolitan areas have a weak character. In fact, metropolitan areas seem almost marked by the fact that the people in them have markedly weak character, compared with the character which develops in simpler and more rugged situations. This weakness of character is the counterpart of another, far more visible feature of metropolitan areas: the homogeneity and lack of variety among the people who live there. Of course, weakness of character and lack of variety, are simply two sides of the same coin: a condition in which people have relatively undifferentiated selves. Character can only occur in a self which is strongly differentiated and whole: by definition, a society where people are relatively homogeneous, is one where individual selves are not strongly differentiated.

Let us begin with the problem of variety. The idea of men as millions of faceless nameless cogs pervades 20th century literature. The nature of modern housing reflects this image and sustains it. The vast majority of housing built today has the touch of mass-production. Adjacent apartments are identical. Adjacent houses are identical. The most devastating image of all was a photograph published in Life magazine several years ago as an advertisement for a timber company: The photograph showed a huge roomful of people; all of them had exactly the same face. The caption underneath explained: In honor of the chairman's birthday, the shareholders of the corporation are wearing masks made from his face.

These are no more than images and indications. . . . But where do all the frightening images of sameness, human digits, and human cogs, come from? Why have Kafka and Camus and Sartre spoken to our hearts?

Many writers have answered this question in detail—[David Riesman in The Lonely Crowd; Kurt Goldstein in The Organism; Max Wertheimer in The Story of Three Days; Abraham Maslow in Motivation and Personality; Rollo May in Man's Search for Himself, etc.]. Their answers all converge on the following essential point: Although a person may have a different mixture of attributes from his neighbour, he is not truly different, until he has a strong center, until his uniqueness is integrated and forceful. At present, in metropolitan areas, this seems not to be the case. Different though they are in detail, people are forever leaning on one another, trying to be whatever will not displease the others, afraid of being themselves.

People do things a certain way "because that's the way to get them done" instead of "because we believe them right." Compromise, going along with the others, the spirit of committees and all that it implies—in metropolitan areas, these characteristics have been made to appear adult, mature, well-adjusted. But euphemisms do little to disguise the fact that people who do things because that's the way to get along with others, instead of doing what they believe in, do it because it avoids coming to terms with their own self, and standing

TOWNS

on it, and confronting others with it. It is easy to defend this weakness of character on the grounds of expediency. But however many excuses are made for it, in the end weakness of character destroys a person; no one weak in character can love himself. The self-hate that it creates is not a condition in which a person can become whole.

By contrast, the person who becomes whole, states his own nature, visibly, and outwardly, loud and clear, for everyone to see. He is not afraid of his own self; he stands up for what he is; he is himself, proud of himself, recognising his shortcomings, trying to change them, but still proud of himself and glad to be himself.

But it is hard to allow that you which lurks beneath the surface to come out and show itself. It is so much easier to live according to the ideas of life which have been laid down by others, to bend your true self to the wheel of custom, to hide yourself in demands which are not yours, and which do not leave you full.

It seems clear, then, that variety, character, and finding your own self, are closely interwoven. In a society where a man can find his own self, there will be ample variety of character, and character will be strong. In a society where people have trouble finding their own selves, people will seem homogeneous, there will be less variety, and character will be weak.

If it is true that character is weak in metropolitan areas today, and we want to do something about it, the first thing we must do, is to understand how the metropolis has this effect.

TT

How does a metropolis create conditions in which people find it hard to find themselves?

We know that the individual forms his own self out of the values, habits and beliefs, and attitudes which his society presents him with. [George Herbert Mead, Mind, Self and Society.] In a metropolis the individual is confronted by a vast tableau of different values, habits and beliefs and attitudes. Whereas, in a primitive society, he had merely to integrate the traditional beliefs (in a sense, there was a self already there for the asking), in modern society each person has literally to fabricate a self, for himself, out of the chaos of values which surrounds him.

If, every day you do something, you meet someone with a slightly different background, and each of these peoples' response to what you do is different even when your actions are the same, the situation becomes more and more confusing. The possibility that you can become secure and strong in yourself, certain of what you are, and certain of what you are doing, goes down radically. Faced constantly with an unpredictable changing social world, people no longer generate the strength to draw on themselves; they draw more and more on the approval of others; they look to see whether people are smiling when they say something, and if they are, they go on saying

8 MOSAIC OF SUBCULTURES

it, and if not, they shut up. In a world like that, it is very hard for

anyone to establish any sort of inner strength.

Once we accept the idea that the formation of the self is a social process, it becomes clear that the formation of a strong social self depends on the strength of the surrounding social order. When attitudes, values, beliefs and habits are highly diffuse and mixed up as they are in a metropolis, it is almost inevitable that the person who grows up in these conditions will be diffuse and mixed up too. Weak character is a direct product of the present metropolitan society.

This argument has been summarized in devastating terms by Margaret Mead [Culture, Change and Character Structure]. A number of writers have supported this view empirically: Hartshorne, H. and May, M. A., Studies in the Nature of Character, New York, Macmillan, 1929, and "A Summary of the Work of the Character Education Inquiry," Religious Education, 1930, Vol. 25, 607-619 and 754-762. "Contradictory demands made upon the child in the varied situations in which he is responsible to adults, not only prevent the organisation of a consistent character, but actually compel inconsistency as the price of peace and self-respect." . . .

But this is not the end of the story. So far we have seen how the diffusion of a metropolis creates weak character. But diffusion, when it becomes pronounced, creates a special kind of superficial uniformity. When many colors are mixed, in many tiny scrambled bits and pieces, the overall effect is grey. This greyness helps to create

weak character in its own way.

In a society where there are many voices, and many values, people cling to those few things which they all have in common. Thus Margaret Mead (op. cit.): "There is a tendency to reduce all values to simple scales of dollars, school grades, or some other simple quantitative measure, whereby the extreme incommensurables of many different sets of cultural values can be easily, though superficially, reconciled." And Joseph T. Klapper [The Effects of Mass Communication, Free Press, 1960]:

"Mass society not only creates a confusing situation in which people find it hard to find themselves—it also . . . creates chaos, in which people are confronted by impossible variety—the variety becomes a slush, which then concentrates merely on the most obvious." . . . It seems then, that the metropolis creates weak character in

two almost opposite ways; first, because people are exposed to a chaos of values; second, because they cling to the superficial uniformity common to all these values. A nondescript mixture of values will tend to produce nondescript people.

III.

There are obviously many ways of solving the problem. Some of these solutions will be private. Others will involve a variety of social processes including, certainly, education, work, play, and

TOWNS

family. I shall now describe one particular solution, which involves the large scale social organisation of the metropolis.

The solution is this. The metropolis must contain a large number of different subcultures, each one strongly articulated, with its own values sharply delineated, and sharply distinguished from the others. But though these subcultures must be sharp and distinct and separate, they must not be closed; they must be readily accessible to one another, so that a person can move easily from one to another, and can settle in the one which suits him best.

This solution is based on two assumptions:

- A person will only be able to find his own self, and therefore to develop a strong character, if he is in a situation where he receives support for his idiosyncrasies from the people and values which surround him.
- 2. In order to find his own self, he also needs to live in a milieu where the possibility of many different value systems is explicitly recognized and honored. More specifically, he needs a great variety of choices, so that he is not misled about the nature of his own person, can see that there are many kinds of people, and can find those whose values and beliefs correspond most closely to his own.
- . . . one mechanism which might underly people's need for an ambient culture like their own: Maslow has pointed out that the process of self actualisation can only start after other needs, like the need for food and love, and security, have already been satisfied. [Motivation and Personality, pp. 84-89.] Now the greater the mixture of kinds of persons in a local urban area, and the more unpredictable the strangers near your house, the more afraid and insecure you will become. In Los Angeles and New York this has reached the stage where people are constantly locking doors and windows, and where a mother does not feel safe sending her fifteen year old daughter to the corner mailbox. People are afraid when they are surrounded by the unfamiliar; the unfamiliar is dangerous. But so long as this fear is an unsolved problem, it will override the rest of their lives. Self-actualisation will only be able to happen when this fear is overcome; and that in turn, can only happen, when people are in familiar territory, among people of their own kind, whose habits and ways they know, and whom they trust.

... However, if we encourage the appearance of distinct subcultures, in order to satisfy the demands of the first assumption, then we certainly do not want to encourage these subcultures to be tribal or closed. That would fly in the face of the very quality which makes the metropolis so attractive. It must be possible, therefore, for people to move easily from one subculture to another, and for them to choose whichever one is most to their taste; and they must be able

MOSAIC OF SUBCULTURES

to do all of this at any moment in their lives. Indeed, if it ever becomes necessary, the law must guarantee each person freedom of access to every subculture. . . .

IV.

It seems clear, then, that the metropolis should contain a large number of mutually accessible subcultures. But why should those subcultures be separated in space. Someone with an aspatial bias could easily argue that these subcultures could, and should, coexist in the same space, since the essential links which create cultures are links between people.

I believe this view, if put forward, would be entirely wrong. I shall now present arguments to show that the articulation of subcultures is an ecological matter; that distinct subcultures will only survive, as distinct subcultures, if they are physically separated in space.

First, there is no doubt that people from different subcultures actually require different things of their environment. Hendricks has made this point clearly. People of different age groups, different interests, different emphasis on the family, different national background, need different kinds of houses, they need different sorts of outdoor environment round about their houses, and above all, they need different kinds of community services. These services can only become highly specialised, in the direction of a particular subculture, if they are sure of customers. They can only be sure of customers if customers of the same subculture live in strong concentrations. People who want to ride horses all need open riding; Germans who want to be able to buy German food may congregate together, as they do around German town, New York; old people may need parks to sit in, less traffic to contend with, nearby nursing services; bachelors may need quick snack food places; Armenians who want to go to the orthodox mass every morning will cluster around an Armenian church; street people collect around their stores and meeting places; people with many small children will be able to collect around local nurseries and open play space.

This makes it clear that different subcultures need their own activities, their own environments. But subcultures not only need to be concentrated in space to allow for the concentration of the necessary activities. They also need to be concentrated so that one subculture does not dilute the next: indeed, from this point of view they not only need to be internally concentrated—but also physically separated

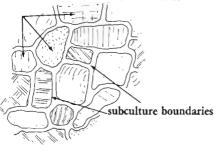
from one another. . . .

We cut the quote short here. The rest of the original paper presents empirical evidence for the need to separate subcultures spatially, and—in this book—we consider that as part of another pattern. The argument is given, with empirical details, in sub-CULTURE BOUNDARY (13).

Therefore:

Do everything possible to enrich the cultures and subcultures of the city, by breaking the city, as far as possible, into a vast mosaic of small and different subcultures, each with its own spatial territory, and each with the power to create its own distinct life style. Make sure that the subcultures are small enough, so that each person has access to the full variety of life styles in the subcultures near his own.

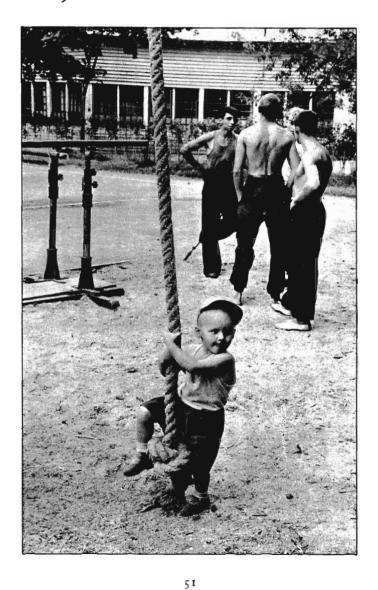
hundreds of different subcultures



4 4 4

We imagine that the smallest subcultures will be no bigger than 150 feet across; the largest perhaps as much as a quarter of a mile—community of 7000 (12), identifiable neighborhood (14), house cluster (37). To ensure that the life styles of each subculture can develop freely, uninhibited by those which are adjacent, it is essential to create substantial boundaries of nonresidential land between adjacent subcultures—subculture Boundary (13)...

9 SCATTERED WORK**

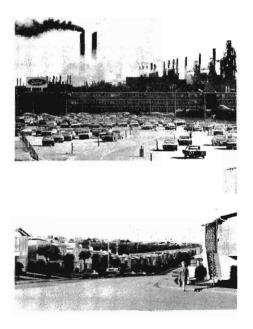


. . . this pattern helps the gradual evolution of MOSAIC OF SUB-CULTURES (8), by placing families and work together, and so intensifying the emergence of highly differentiated subcultures, each with its individual character.



The artificial separation of houses and work creates intolerable rifts in people's inner lives.

In modern times almost all cities create zones for "work" and other zones for "living" and in most cases enforce the separation by law. Two reasons are given for the separation. First, the work-



Concentration and segregation of work . . . leads to dead neighborhoods.

9 SCATTERED WORK

places need to be near each other, for commercial reasons. Second, workplaces destroy the quiet and safety of residential neighborhoods.

But this separation creates enormous rifts in people's emotional lives. Children grow up in areas where there are no men, except on weekends; women are trapped in an atmosphere where they are expected to be pretty, unintelligent housekeepers; men are forced to accept a schism in which they spend the greater part of their waking lives "at work, and away from their families" and then the other part of their lives "with their families, away from work."

Throughout, this separation reinforces the idea that work is a toil, while only family life is "living"—a schizophrenic view which creates tremendous problems for all the members of a family.

In order to overcome this schism and re-establish the connection between love and work, central to a sane society, there needs to be a redistribution of all workplaces throughout the areas where people live, in such a way that children are near both men and women during the day, women are able to see themselves both as loving mothers and wives and still capable of creative work, and men too are able to experience the hourly connection of their lives as workmen and their lives as loving husbands and fathers.

What are the requirements for a distribution of work that can overcome these problems?

- 1. Every home is within 20-30 minutes of many hundreds of workplaces.
- 2. Many workplaces are within walking distance of children and families.
- 3. Workers can go home casually for lunch, run errands, work half-time, and spend half the day at home.
- Some workplaces are in homes; there are many opportunities for people to work from their homes or to take work home.
- Neighborhoods are protected from the traffic and noise generated by "noxious" workplaces.

The only pattern of work which does justice to these requirements is a pattern of scattered work: a pattern in which work is strongly decentralized. To protect the neighborhoods from the noise and traffic that workplaces often generate, some noisy work

places can be in the boundaries of neighborhoods, communities and subcultures—see subculture Boundary (13); others, not noisy or noxious, can be built right into homes and neighborhoods. In both cases, the crucial fact is this: every home is within a few minutes of dozens of workplaces. Then each household would have the chance to create for itself an intimate ecology of home and work: all its members have the option of arranging a workplace for themselves close to each other and their friends. People can meet for lunch, children can drop in, workers can run home. And under the prompting of such connections the workplaces themselves will inevitably become nicer places, more like homes, where life is carried on, not banished for eight hours.

This pattern is natural in traditional societies, where workplaces are relatively small and households comparatively self-sufficient. But is it compatible with the facts of high technology and the concentration of workers in factories? How strong is the need for workplaces to be near each other?

The main argument behind the centralization of plants, and their gradual increase in size, is an economic one. It has been demonstrated over and again that there are economies of scale in production, advantages which accrue from producing a huge number of goods or services in one place.

However, large centralized organizations are not intrinsic to mass production. There are many excellent examples which demonstrate the fact that where work is substantially scattered, people can still produce goods and services of enormous complexity. One of the best historical examples is the Jura Federation of watchmakers, formed in the mountain villages of Switzerland in the early 1870's. These workers produced watches in their home workshops, each preserving his independence while coordinating his efforts with other craftsmen from the surrounding villages. (For an account of this federation, see, for example, George Woodcock, Anarchism: A History of Libertarian Ideas and Movements, Cleveland: Meridian Books, 1962, pp. 168-69.)

In our own time, Raymond Vernon has shown that small, scattered workplaces in the New York metropolitan economy, respond much faster to changing demands and supplies, and that the degree of creativity in agglomerations of small businesses is vastly greater than that of the more cumbersome and centralized

9 SCATTERED WORK

industrial giants. (See Raymond Vernon, *Metropolis* 1985, Chapter 7: External Economics.)

To understand these facts, we must first realize that the city itself is a vast centralized workspace and that all the benefits of this centralization are potentially available to every work group that is a part of the city's vast work community. In effect, the urban region as a whole acts to produce economies of scale by bringing thousands of work groups within range of each other. If this kind of "centralization" is properly developed, it can support an endless number of combinations between small, scattered workgroups; and it can lend great flexibility to the modes of production. "Once we understand that modern industry does not necessarily bring with it financial and physical concentration, the growth of smaller centers and a more widespread distribution of genuine benefits of technology will, I think, take place" (Lewis Mumford, Sticks and Stones, New York, 1924, p. 216).

Remember that even such projects as complicated and seemingly centralized as the building of a bridge or a moon rocket, can be organized this way. Contracting and subcontracting procedures make it possible to produce complicated industrial goods and services by combining the efforts of hundreds of small firms. The Apollo project drew together more than 30,000 independent firms to produce the complicated spaceships to the moon.

Furthermore, there is evidence that the agencies which set up such multiple contracts look for small, semi-autonomous firms. They know instinctively that the smaller, more self-governing the group, the better the product and the service (Small Sellers and Large Buyers in American Industry, Business Research Center, College of Business Administration, Syracuse University, New York, 1961).

Let us emphasize: we are not suggesting that the decentralization of work should take precedence over a sophisticated technology. We believe that the two are compatible: it is possible to fuse the human requirements for interesting and creative work with the exquisite technology of modern times. It is possible to make television sets, xerox machines and IBM typewriters, automobiles, stereo sets and washing machines under human working conditions. We mention in particular the xerox and IBM typewriters because they have played a vital role for us, the authors of

TOWNS

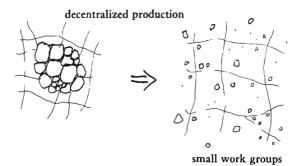
this book. We could not have made this book together, in the communal way we have done, without these machines: and we consider them a vital part of the new decentralized society we seek.



A small factory in Zemun, Yugoslavia; the work group is building a corn picking machine, an item they themselves decided to produce and sell in the marketplace.

Therefore:

Use zoning laws, neighborhood planning, tax incentives, and any other means available to scatter workplaces throughout the city. Prohibit large concentrations of work, without family life around them. Prohibit large concentrations of family life, without workplaces around them.

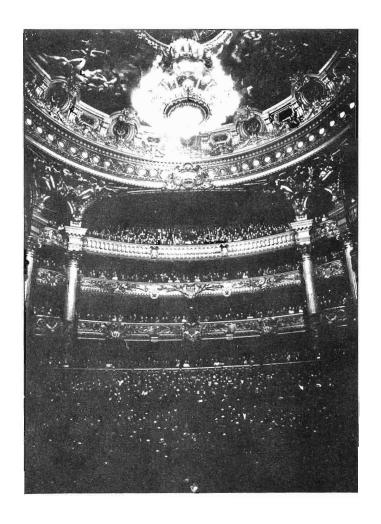


9 SCATTERED WORK

* * *

The scattered work itself can take a great variety of forms. It can occur in belts of industry, where it is essential for an industry to occupy an acre or more between subcultures—subculture Boundary (13), industrial ribbon (42); it can occur in work communities, which are scattered among the neighborhoods—neighborhood Boundary (15), work community (41); and it can occur in individual workshops, right among the houses—home workshop (157). The size of each workplace is limited only by the nature of human groups and the process of self-governance. It is discussed in detail in self-governing workshops and offices (80). . . .

IO MAGIC OF THE CITY



... next to the Mosaic of Subcultures (8), perhaps the most important structural feature of a city is the pattern of those centers where the city life is most intense. These centers can help to form the mosaic of subcultures by their variety; and they can also help to form CITY COUNTRY FINGERS (3), if each of the centers is at a natural meeting point of several fingers. This pattern was first written by Luis Racionero, under the name "Downtowns of 300,000."



There are few people who do not enjoy the magic of a great city. But urban sprawl takes it away from everyone except the few who are lucky enough, or rich enough, to live close to the largest centers.

This is bound to happen in any urban region with a single high density core. Land near the core is expensive; few people can live near enough to it to give them genuine access to the city's life; most people live far out from the core. To all intents and purposes, they are in the suburbs and have no more than occasional access to the city's life. This problem can only be solved by decentralizing the core to form a multitude of smaller cores, each devoted to some special way of life, so that, even though decentralized, each one is still intense and still a center for the region as a whole.

The mechanism which creates a single isolated core is simple. Urban services tend to agglomerate. Restaurants, theaters, shops, carnivals, cafes, hotels, night clubs, entertainment, special services, tend to cluster. They do so because each one wants to locate in that position where the most people are. As soon as one nucleus has formed in a city, each of the interesting services—especially those which are most interesting and therefore require the largest catch basin—locate themselves in this one nucleus. The one nucleus keeps growing. The downtown becomes enormous. It becomes rich, various, fascinating. But gradually, as the metropolitan area grows, the average distance from an individual house

to this one center increases; and land values around the center rise so high that houses are driven out from there by shops and offices—until soon no one, or almost no one, is any longer genuinely in touch with the magic which is created day and night within this solitary center.

The problem is clear. On the one hand people will only expend so much effort to get goods and services and attend cultural events, even the very best ones. On the other hand, real variety and choice can only occur where there is concentrated, centralized activity; and when the concentration and centralization become too great, then people are no longer willing to take the time to go to it.

If we are to resolve the problem by decentralizing centers, we must ask what the minimum population is that can support a central business district with the magic of the city. Otis D. Duncan in "The Optimum Size of Cities" (Cities and Society, P. K. Hatt and A. J. Reiss, eds., New York: The Free Press, 1967, pp. 759–72), shows that cities with more than 50,000 people have a big enough market to sustain 61 different kinds of retail shops and that cities with over 100,000 people can support sophisticated jewelry, fur, and fashion stores. He shows that cities of 100,000 can support a university, a museum, a library, a zoo, a symphony orchestra, a daily newspaper, AM and FM radio, but that it takes a population of 250,000 to 500,000 to support a specialized professional school like a medical school, an opera, or all of the TV networks.

In a study of regional shopping centers in metropolitan Chicago, Brian K. Berry found that centers with 70 kinds of retail shops serve a population base of about 350,000 people (Geography of Market Centers and Retail Distribution, New Jersey: Prentice-Hall, 1967, p. 47). T. R. Lakshmanan and Walter G. Hansen, in "A Retail Potential Model" (American Institute of Planners Journal, May 1965, pp. 134–43), showed that full-scale centers with a variety of retail and professional services, as well as recreational and cultural activities, are feasible for groups of 100,000 to 200,000 population.

It seems quite possible, then, to get very complex and rich urban functions at the heart of a catch basin which serves no more than 300,000 people. Since, for the reasons given earlier, it is

IO MAGIC OF THE CITY

desirable to have as many centers as possible, we propose that the city region should have one center for each 300,000 people, with the centers spaced out widely among the population, so that every person in the region is reasonably close to at least one of these major centers.

To make this more concrete, it is interesting to get some idea of the range of distances between these centers in a typical urban region. At a density of 5000 persons per square mile (the density of the less populated parts of Los Angeles) the area occupied by 300,000 will have a diameter of about nine miles; at a higher density of 80,000 persons per square mile (the density of central Paris) the area occupied by 300,000 people has a diameter of about two miles. Other patterns in this language suggest a city much more dense than Los Angeles, yet somewhat less dense than central Paris—FOUR-STORY LIMIT (21), DENSITY RINGS (29). We therefore take these crude estimates as upper and lower bounds. If each center serves 300,000 people, they will be at least two miles apart and probably no more than nine miles apart.

One final point must be discussed. The magic of a great city comes from the enormous specialization of human effort there. Only a city such as New York can support a restaurant where you can eat chocolate-covered ants, or buy three-hundred-year-old books of poems, or find a Caribbean steel band playing with American folk singers. By comparison, a city of 300,000 with a second-rate opera, a couple of large department stores, and half a dozen good restaurants is a hick town. It would be absurd if the new downtowns, each serving 300,000 people, in an effort to capture the magic of the city, ended up as a multitude of second-class hick towns.

This problem can only be solved if each of the cores not only serves a catch basin of 300,000 people but also offers some kind of special quality which none of the other centers have, so that each core, though small, serves several million people and can therefore generate all the excitement and uniqueness which become possible in such a vast city.

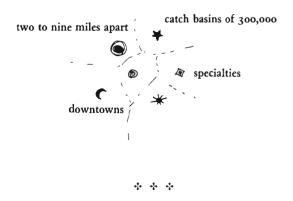
Thus, as it is in Tokyo or London, the pattern must be implemented in such a way that one core has the best hotels, another the best antique shops, another the music, still another has the fish and sailing boats. Then we can be sure that every person is

TOWNS

within reach of at least one downtown and also that all the downtowns are worth reaching for and really have the magic of a great metropolis.

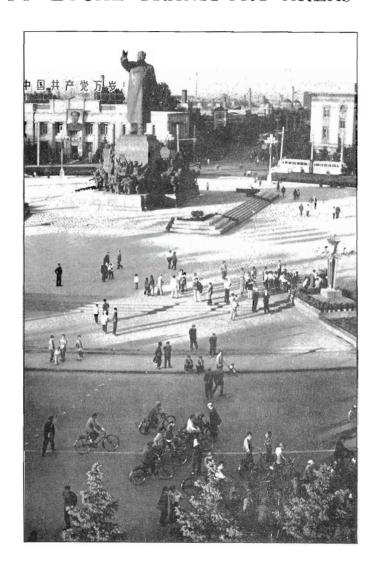
Therefore:

Put the magic of the city within reach of everyone in a metropolitan area. Do this by means of collective regional policies which restrict the growth of downtown areas so strongly that no one downtown can grow to serve more than 300,000 people. With this population base, the downtowns will be between two and nine miles apart.



Treat each downtown as a pedestrian and local transport area—Local transport areas (11), promenade (31), with good transit connections from the outlying areas—web of public transportation (16); encourage a rich concentration of night life within each downtown—night life (33), and set aside at least some part of it for the wildest kind of street life—carnival (58), dancing in the street (63)...

II LOCAL TRANSPORT AREAS**



. . . superimposed over the MOSAIC OF SUBCULTURES (8), there is a need for a still larger cellular structure: the local transport areas. These areas, 1-2 miles across, not only help to form subcultures, by creating natural boundaries in the city, but they can also help to generate the individual city fingers in the CITY COUNTRY FINGERS (3), and they can help to circumscribe each downtown area too, as a special self-contained area of local transportation—MAGIC OF THE CITY (10).

* * *

Cars give people wonderful freedom and increase their opportunities. But they also destroy the environment, to an extent so drastic that they kill all social life.

The value and power of the car have proved so great that it seems impossible to imagine a future without some form of private, high-speed vehicle. Who will willingly give up the degree of freedom provided by cars? At the same time, it is undeniably true that cars turn towns to mincemeat. Somehow local areas must be saved from the pressure of cars or their future equivalents.

It is possible to solve the problem as soon as we make a distinction between short trips and long trips. Cars are not very good for short trips inside a town, and it is on these trips that they do their greatest damage. But they are good for fairly long trips, where they cause less damage. The problem will be solved if towns are divided up into areas about one mile across, with the idea that cars may be used for trips which leave these areas, but that other, slower forms of transportation will be used for all trips inside these areas—foot, bike, horse, taxi. All it needs, physically, is a street pattern that discourages people from using private cars for trips within these areas, and encourages the use of walking, bikes, horses, and taxis instead—but allows the use of cars for trips which leave the area.

Let us start with a list of the obvious social problems created by the car:

Air pollution

II LOCAL TRANSPORT AREAS

Noise
Danger
Ill health
Congestion
Parking problem
Eyesore

The first two are very serious, but are not inherent in the car; they could both be solved, for instance, by an electric car. They are, in that sense, temporary problems. Danger will be a persistent feature of the car so long as we go on using high-speed vehicles for local trips. The widespread lack of exercise and consequent ill health created by the use of motor-driven vehicles will persist unless offset by an amount of daily exercise at least equal to a 20 minute walk per day. And finally, the problems of congestion and loss of speed, difficulty and cost of parking, and eyesore are all direct results of the fact that the car is a very large vehicle which consumes a great deal of space.

The fact that cars are large is, in the end, the most serious aspect of a transportation system based on the use of cars, since it is inherent in the very nature of cars. Let us state this problem in its most pungent form. A man occupies about 5 square feet of space when he is standing still, and perhaps 10 square feet when he is walking. A car occupies about 350 square feet when it is standing still (if we include access), and at 30 miles an hour, when cars are 3 car lengths apart, it occupies about 1000 square feet. As we know, most of the time cars have a single occupant. This means that when people use cars, each person occupies almost 100 times as much space as he does when he is a pedestrian.

If each person driving occupies an area 100 times as large as he does when he is on his feet, this means that people are 10 times as far apart. In other words, the use of cars has the overall effect of spreading people out, and keeping them apart.

The effect of this particular feature of cars on the social fabric is clear. People are drawn away from each other; densities and corresponding frequencies of interaction decrease substantially. Contacts become fragmented and specialized, since they are localized by the nature of the interaction into well-defined indoor places—the home, the workplace, and maybe the homes of a few isolated friends.

It is quite possible that the collective cohesion people need to form a viable society just cannot develop when the vehicles which people use force them to be 10 times farther apart, on the average, than they have to be. This states the possible social cost of cars in its strongest form. It may be that cars cause the breakdown of society, simply because of their geometry.

At the same time that cars cause all these difficulties, they also have certain unprecedented virtues, which have in fact led to their enormous success. These virtues are:

Flexibility Privacy Door-to-door trips, without transfer Immediacy

These virtues are particularly important in a metropolitan region which is essentially two-dimensional. Public transportation can provide very fast, frequent, door-to-door service, along certain arteries. But in the widely spread out, two-dimensional character of a modern urban region, public transportation by itself cannot compete successfully with cars. Even in cities like London and Paris, with the finest urban public transportation in the world, the trains and buses have fewer riders every year because people are switching to cars. They are willing to put up with all the delays, congestion, and parking costs, because apparently the convenience and privacy of the car are more valuable.

Under theoretical analysis of this situation, the only kind of transportation system which meets all the needs is a system of individual vehicles, which can use certain high-speed lines for long cross-city trips and which can use their own power when they leave the public lines in local areas. The systems which come closest to this theoretical model are the various Private Rapid Transit proposals; one example is the Westinghouse Starrcar—a system in which tiny two-man vehicles drive on streets locally and onto high-speed public rails for long trips.

However, the Starrcar-type systems have a number of disadvantages. They make relatively little contribution to the problem of space. The small cars, though smaller than a conventional car, still take up vastly more space than a person. Since the private cars will not be capable of long cross-country trips, they must be

II LOCAL TRANSPORT AREAS

treated as a "second vehicle"—and are rather expensive. They make no contribution to the health problem, since people are still sitting motionless while they travel. The system is relatively antisocial, since people are still encapsulated in "bubbles" while they travel. It is highly idealistic, since it works if everyone has a Starrcar, but makes no allowance for the great variety of movement which people actually desire, i.e., bikes, horses, jalopies, old classic cars, family buses.

We propose a system which has the advantages of the Starrcar system but which is more realistic, easier to implement, and, we believe, better adapted to people's needs. The essence of the system lies in the following two propositions:

1. For local trips, people use a variety of low-speed, low-cost vehicles (bicycles, tricycles, scooters, golf carts, bicycle buggies, horses, etc.), which take up less room than cars and which all leave their passengers in closer touch with their environment and with one another.

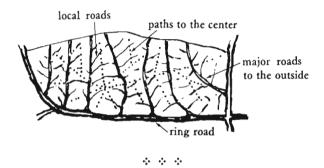


Many ways of getting around on local trips.

2. People still own, and use, cars and trucks—but mainly for long trips. We assume that these cars can be made to be quiet, nonpolluting, and simple to repair, and that people simply consider them best suited for long distance travel. It will still be possible for people to use a car or a truck for a local trip, either in a case of emergency, or for some special convenience. However, the town is constructed in such a way that it is actually expensive and inconvenient to use cars for local trips—so that people only do it when they are willing to pay for the very great social costs of doing so.

Therefore:

Break the urban area down into local transport areas, each one between I and 2 miles across, surrounded by a ring road. Within the local transport area, build minor local roads and paths for internal movements on foot, by bike, on horseback, and in local vehicles; build major roads which make it easy for cars and trucks to get to and from the ring roads, but place them to make internal local trips slow and inconvenient.



To keep main roads for long distance traffic, but not for internal local traffic, lay them out as parallel one way roads, and keep these parallel roads away from the center of the area, so that they are very good for getting to the ring roads, but inconvenient for short local trips—PARALLEL ROADS (23). Lay out abundant footpaths and bike paths and green streets, at right angles to the main roads, and make these paths for local traffic go directly through the center—GREEN STREETS (51), NETWORK OF PATHS AND CARS (52), BIKE PATHS AND RACKS (56); sink the ring roads around the outside of each area, or shield the noise they make some other way—RING ROADS (17); keep parking to a minimum within the area, and keep all major parking garages near the ring roads—NINE PER CENT PARKING (22), SHIELDED PARKING (97); and build a major interchange within the center of the area—INTERCHANGE (34). . . .

build up these larger city patterns from the grass roots, through action essentially controlled by two levels of self-governing communities, which exist as physically identifiable places;

- 12. COMMUNITY OF 7000
- 13. SUBCULTURE BOUNDARY
- 14. IDENTIFIABLE NEIGHBORHOOD
- 15. NEIGHBORHOOD BOUNDARY

12 COMMUNITY OF 7000*



. . . the MOSAIC OF SUBCULTURES (8) is made up of a great number of large and small self-governing communities and neighborhoods. Community of 7000 helps define the structure of the large communities.

4 4 4

Individuals have no effective voice in any community of more than 5000-10,000 persons.

People can only have a genuine effect on local government when the units of local government are autonomous, self-governing, self-budgeting communities, which are small enough to create the possibility of an immediate link between the man in the street and his local officials and elected representatives.

This is an old idea. It was the model for Athenian democracy in the third and fourth centuries B.C.; it was Jefferson's plan for American democracy; it was the tack Confucius took in his book on government, *The Great Digest*.

For these people, the practice of exercising power over local matters was itself an experience of intrinsic satisfaction. Sophocles wrote that life would be unbearable were it not for the freedom to initiate action in a small community. And it was considered that this experience was not only good in itself, but was the only way of governing that would not lead to corruption. Jefferson wanted to spread out the power not because "the people" were so bright and clever, but precisely because they were prone to error, and it was therefore dangerous to vest power in the hands of a few who would inevitably make big mistakes. "Break the country into wards" was his campaign slogan, so that the mistakes will be manageable and people will get practice and improve.

Today the distance between people and the centers of power that govern them is vast—both psychologically and geographically. Milton Kotler, a Jeffersonian, has described the experience:

The process of city administration is invisible to the citizen who sees little evidence of its human components but feels the sharp pain of taxation. With increasingly poor public service, his desires and needs are more insistently expressed. Yet his expressions of need seem

to issue into thin air, for government does not appear attentive to his demands. This disjunction between citizen and government is the major political problem of city government, because it embodies the dynamics of civil disorder. . . . (Milton Kotler, Neighborhood Foundations, Memorandum #24; "Neighborhood corporations and the reorganization of city government," unpub. ms., August 1967.)

There are two ways in which the physical environment, as it is now ordered, promotes and sustains the separation between citizens and their government. First, the size of the political community is so large that its members are separated from its leaders simply by their number. Second, government is invisible, physically located out of the realm of most citizens' daily lives. Unless these two conditions are altered, political alienation is not likely to be overcome.

1. The size of the political community. It is obvious that the larger the community the greater the distance between the average citizen and the heads of government. Paul Goodman has proposed a rule of thumb, based on cities like Athens in their prime, that no citizen be more than two friends away from the highest member of the local unit. Assume that everyone knows about 12 people in his local community. Using this notion and Goodman's rule we can see that an optimum size for a political community would be about 12³ or 1728 households or 5500 persons. This figure corresponds to an old Chicago school estimate of 5000. And it is the same order of magnitude as the size of ECCO, the neighborhood corporation in Columbus, Ohio, of 6000 to 7000, described by Kotler (Committee on Government Operations, U.S. Senate, 89th Congress, Second Session, Part 9, December 1966).

The editors of *The Ecologist* have a similar intuition about the proper size for units of local government. (See their *Blue-print for Survival*, Penguin Books, 1972, pp. 50-55.) And Terence Lee, in his study, "Urban neighborhood as a socio-spatial schema," *Ekistics* 177, August 1970, gives evidence for the importance of the spatial community. Lee gives 75 acres as a natural size for a community. At 25 persons per acre, such a community would accommodate some 2000 persons; at 60 persons per acre, some 4500.

2. The visible location of local government. Even when local

12 COMMUNITY OF 7000

branches of government are decentralized in function, they are often still centralized in space, hidden in vast municipal city-county buildings out of the realm of everyday life. These places are intimidating and alienating. What is needed is for every person to feel at home in the place of his local government with his ideas and complaints. A person must feel that it is a forum, that it is his directly, that he can call and talk to the person in charge of such and such, and see him personally within a day or two.

For this purpose, local forums must be situated in highly visible and accessible places. They could, for instance, be located in the most active marketplace of each community of 5000 to 7000. We discuss this possibility more fully under LOCAL TOWN HALL (44), but we emphasize it here, since the provision of a political "heart," a political center of gravity, is an essential part of a political community.

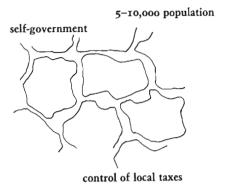


Community meeting of several thousand.

Therefore:

Decentralize city governments in a way that gives local control to communities of 5,000 to 10,000 persons. As nearly as possible, use natural geographic and historical boundaries to mark these communities. Give each community the power to initiate, decide, and execute the affairs that con-

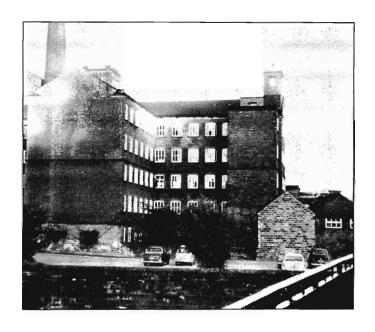
cern it closely: land use, housing, maintenance, streets, parks, police, schooling, welfare, neighborhood services.



4-4-4-

Separate the communities from one another by means of substantial areas—subculture boundary (13); subdivide each community into 10 or 20 independent neighborhoods, each with a representative on the community council—identifiable neighborhood (14); provide a central place where people have a chance to come together—eccentric nucleus (28), promenade (31); and in this central place provide a local town hall, as a focal point for the community's political activity—local town hall (44)...

13 SUBCULTURE BOUNDARY*



. . . the Mosaic of Subcultures (8) and its individual subcultures, whether they are COMMUNITIES OF 7000 (12) OF IDENTIFIABLE NEIGHBORHOODS (14), need to be completed by boundaries. In fact, the mere creation of the boundary areas, according to this pattern, will begin to give life to the subcultures between the boundaries, by giving them a chance to be themselves.



The mosaic of subcultures requires that hundreds of different cultures live, in their own way, at full intensity, next door to one another. But subcultures have their own ecology. They can only live at full intensity, unhampered by their neighbors, if they are physically separated by physical boundaries.

In mosaic of subcultures (8) we have argued that a great variety of subcultures in a city is not a racist pattern which forms ghettos, but a pattern of opportunity which allows a city to contain a multitude of different ways of life with the greatest possible intensity.

But this mosaic will only come into being if the various subcultures are insulated from one another, at least enough so that no one of them can oppress, or subdue, the life style of its neighbors, nor, in return, feel oppressed or subdued. As we shall see, this requires that adjacent subcultures are separated by swaths of open land, workplaces, public buildings, water, parks, or other natural boundaries.

The argument hinges on the following fact. Wherever there is an area of homogeneous housing in a city, its inhabitants will exert strong pressure on the areas adjacent to it to make them conform to their values and style. For example, the "straight" people who lived near the "hippie" Haight Ashbury district in San Francisco in 1967 were afraid that the Haight would send their land values down, so they put pressure on City Hall to get the Haight "cleaned up"—that is, to make the Haight more like their own area. This seems to happen whenever one subculture is

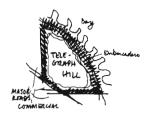
13 SUBCULTURE BOUNDARY

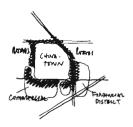
very different in style from another one next to it. People will be afraid that the neighboring area is going to "encroach" on their own area, upset their land values, undermine their children, send the "nice" people away, and so forth, and they will do everything they can to make the next door area like their own.

Carl Werthman, Jerry Mandel, and Ted Dienstfrey (Planning and the Purchase Decision: Why People Buy in Planned Communities, University of California, Berkeley, July 1965) have noticed the same phenomenon even among very similar subcultures. In a study of people living in tract developments, they found that the tension created by adjacencies between dissimilar social groups disappeared when there was enough open land, unused land, freeway, or water between them. In short, a physical barrier between the adjacent subcultures, if big enough, took the heat off.

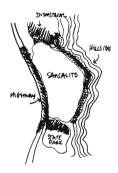
Obviously, a rich mix of subcultures will not be possible if each subculture is being inhibited by pressure from its neighbors. The subcultures must therefore be separated by land, which is not residential land, and by as much of it as possible.

There is another kind of empirical observation which supports this last statement. If we look around a metropolitan area, and pinpoint the strongly differentiated subcultures, those with character, we shall always find that they are near boundaries and hardly ever close to other communities. For example, in San Francisco the two most distinctive areas are Telegraph Hill and Chinatown. Telegraph Hill is surrounded on two sides by the docks. Chinatown is bounded on two sides by the city's banking area. The same is true in the larger Bay Area. Point Richmond and Sausalito,





Subculture boundaries.



two of the most distinctive communities in the greater Bay Area, are both almost completely isolated. Sausalito is surrounded by hills and water; Point Richmond by water and industrial land. Communities which are cut off to some extent are free to develop their own character.

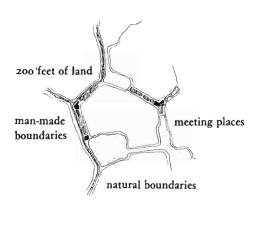
Further support for our argument comes from ecology. In nature, the differentiation of a species into subspecies is largely due to the process of geographic speciation, the genetic changes which take place during a period of spatial isolation (see, for example, Ernst Mayr, Animal Species and Evolution, Cambridge, 1963, Chapter 18: "The Ecology of Speciation," pp. 556–85). It has been observed in a multitude of ecological studies that members of the same species develop distinguishable traits when separated from other members of the species by physical boundaries like a mountain ridge, a valley, a river, a dry strip of land, a cliff, or a significant change in climate or vegetation. In just the same way, differentiation between subcultures in a city will be able to take place most easily when the flow of those elements which account for cultural variety—values, style, information, and so on—is at least partially restricted between neighboring subcultures.

Therefore:

Separate neighboring subcultures with a swath of land at least 200 feet wide. Let this boundary be natural—wilderness, farmland, water—or man-made—railroads, major roads, parks, schools, some housing. Along the seam be-

13 SUBCULTURE BOUNDARY

tween two subcultures, build meeting places, shared functions, touching each community.



Natural boundaries can be things like THE COUNTRYSIDE (7), SACRED SITES (24), ACCESS TO WATER (25), QUIET BACKS (59), ACCESSIBLE GREEN (60), POOLS AND STREAMS (64), STILL WATER (71). Artificial boundaries can include RING ROADS (17), PARALLEL ROADS (23), WORK COMMUNITIES (41), INDUSTRIAL RIBBONS (42), TEENAGE SOCIETY (84), SHIELDED PARKING (97). The interior organization of the subculture boundary should follow two broad principles. It should concentrate the various land uses to form functional clusters around activity—ACTIVITY NODES (30), WORK COMMUNITY (41). And the boundary should be accessible to both the neighboring communities, so that it is a meeting ground for them—ECCENTRIC NUCLEUS (28) . . .

14 IDENTIFIABLE NEIGHBORHOOD**



. . . the MOSAIC OF SUBCULTURES (8) and the COMMUNITY OF 7000 (12) are made up of neighborhoods. This pattern defines the neighborhoods. It defines those small human groups which create the energy and character which can bring the larger COMMUNITY OF 7000 (12) and the MOSAIC OF SUBCULTURES (8) to life.



People need an identifiable spatial unit to belong to.



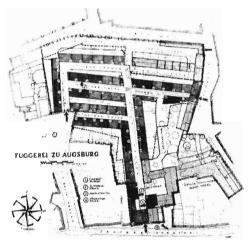
Today's pattern of development destroys neighborhoods.

They want to be able to identify the part of the city where they live as distinct from all others. Available evidence suggests, first, that the neighborhoods which people identify with have extremely small populations; second, that they are small in area; and third, that a major road through a neighborhood destroys it.

1. What is the right population for a neighborhood?

The neighborhood inhabitants should be able to look after their own interests by organizing themselves to bring pressure on city hall or local governments. This means the families in a neighborhood must be able to reach agreement on basic decisions about public services, community land, and so forth. Anthropological evidence suggests that a human group cannot coordinate itself to reach such decisions if its population is above 1500, and many people set the figure as low as 500. (See, for example, Anthony Wallace, Housing and Social Structure, Philadelphia Housing Au-

TOWNS



A famous neighborhood: the Fuggerei in Augsburg.

thority, 1952, available from University Microfilms, Inc., Ann Arbor, Michigan, pp. 21-24.) The experience of organizing community meetings at the local level suggests that 500 is the more realistic figure.

- 2. As far as the physical diameter is concerned, in Philadelphia, people who were asked which area they really knew usually limited themselves to a small area, seldom exceeding the two to three blocks around their own house. (Mary W. Herman, "Comparative Studies of Identification Areas in Philadelphia," City of Philadelphia Community Renewal Program, Technical Report No. 9, April 1964.) One-quarter of the inhabitants of an area in Milwaukee considered a neighborhood to be an area no larger than a block (300 feet). One-half considered it to be no more than seven blocks. (Svend Riemer, "Villagers in Metropolis," British Journal of Sociology, 2, No. 1, March 1951, pp. 31-43.)
- 3. The first two features, by themselves, are not enough. A neighborhood can only have a strong identity if it is protected from heavy traffic. Donald Appleyard and Mark Linteli have found that the heavier the traffic in an area, the less people think of it as home territory. Not only do residents view the streets with heavy traffic as less personal, but they feel the same about

14 IDENTIFIABLE NEIGHBORHOOD

the houses along the street. ("Environmental Quality of City Streets," by Donald Appleyard and Mark Lintell, Center for Planning and Development Research, University of California, Berkeley, 1971.)

neighborhood with light traffic 2000 vehicles/day 200 vehicles/peak hour 15-20 mph Two-way

Residents speaking on "neighboring and visiting"

I feel it's home. There are warm people on this street. I don't feel alone.

Everbody knows each other.

Definitely a friendly street.

Residents speaking on "home territory"

The street life doesn't intrude into the home . . . only happiness comes in from the street.

I feel my home extends to the whole block.

neighborhood with moderate traffic 6000 vehicles/day 550 vehicles/peak hour 25 mph Two-way

Residents speaking on "neighboring and visiting"

You see the neighbors but they aren't close friends.

Don't feel there is any community any more, but people say hello.

Residents speaking on "home territory"

It's a medium place—doesn't require any thought.

neighborhood with heavy traffic 16,000 vehicles/day 1900 vehicles/peak hour 35-40 mph One-way

Residents speaking on "neighboring and visiting"

It's not a friendly street-no one offers help.

People are afraid to go into the street because of the traffic.

Residents speaking on "home territory"

It is impersonal and public.

Noise from the street intrudes into my home.

How shall we define a major road? The Appleyard-Lintell study found that with more than 200 cars per hour, the quality of the neighborhood begins to deteriorate. On the streets with 550 cars per hour people visit their neighbors less and never gather in the street to meet and talk. Research by Colin Buchanan indicates that major roads become a barrier to free pedestrian movement when "most people (more than 50%) . . . have to adapt their movement to give way to vehicles." This is based on "an average delay to all crossing pedestrians of 2 seconds . . . as a very rough guide to the borderline between acceptable and unacceptable conditions," which happens when the traffic reaches some 150 to 250 cars per hour. (Colin D. Buchanan, Traffic in Towns, London: Her Majesty's Stationery Office, 1963, p. 204.) Thus any street with greater than 200 cars per hour, at any time, will probably seem "major," and start to destroy the neighborhood identity.

A final note on implementation. Several months ago the City of Berkeley began a transportation survey with the idea of deciding the location of all future major arteries within the city. Citizens were asked to make statements about areas which they wanted to protect from heavy traffic. This simple request has caused widespread grass roots political organizing to take place: at the time of this writing more than 30 small neighborhoods have identified themselves, simply in order to make sure that they succeed in keeping heavy traffic out. In short, the issue of traffic is so fundamental to the fact of neighborhoods, that neighborhoods emerge, and crystallize, as soon as people are asked to decide where they want nearby traffic to be. Perhaps this is a universal way of implementing this pattern in existing cities.

Therefore:

Help people to define the neighborhoods they live in, not more than 300 yards across, with no more than 400 or 500 inhabitants. In existing cities, encourage local groups to organize themselves to form such neighborhoods. Give the neighborhoods some degree of autonomy as far as taxes and land controls are concerned. Keep major roads outside these neighborhoods.

14 IDENTIFIABLE NEIGHBORHOOD

max. population of 500

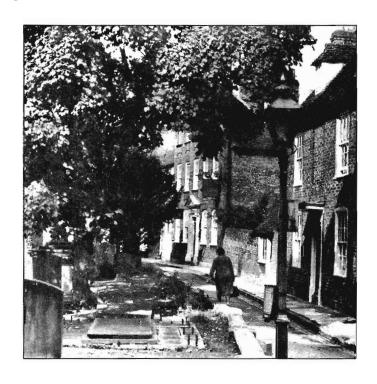


max diameter of 300 yards



Mark the neighborhood, above all, by gateways wherever main paths enter it—main gateways (53)—and by modest boundaries of non-residential land between the neighborhoods—neighborhoods—neighborhood boundary (15). Keep major roads within these boundaries—Parallel Roads (23); give the neighborhood a visible center, perhaps a common or a green—accessible green (60)—or a small public square (61); and arrange houses and workshops within the neighborhood in clusters of about a dozen at a time—house cluster (37), work community (41)...

I 5 NEIGHBORHOOD BOUNDARY*

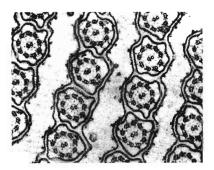


. . . the physical boundary needed to protect subcultures from one another, and to allow their ways of life to be unique and idiosyncratic, is guaranteed, for a COMMUNITY OF 7000 (12), by the pattern subculture boundary (13). But a second, smaller kind of boundary is needed to create the smaller IDENTIFIABLE NEIGHBORHOOD (14).



The strength of the boundary is essential to a neighborhood. If the boundary is too weak the neighborhood will not be able to maintain its own identifiable character.

The cell wall of an organic cell is, in most cases, as large as, or larger, than the cell interior. It is not a surface which divides inside from outside, but a coherent entity in its own right, which preserves the functional integrity of the cell and also provides for a multitude of transactions between the cell interior and the ambient fluids.



Cell with cell wall: The cell wall is a place in its own right.

We have already argued, in SUBCULTURE BOUNDARY (13), that a human group, with a specific life style, needs a boundary around it to protect its idiosyncrasies from encroachment and dilution by surrounding ways of life. This subculture boundary,

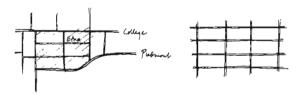
then, functions just like a cell wall—it protects the subculture and creates space for its transactions with surrounding functions.

The argument applies as strongly to an individual neighborhood, which is a subculture in microcosm.

However, where the subculture boundaries require wide swaths of land and commercial and industrial activity, the neighborhood boundaries can be much more modest. Indeed it is not possible for a neighborhood of 500 or more to bound itself with shops and streets and community facilities; there simply aren't enough to go around. Of course, the few neighborhood shops there are—the street cafe (88), the corner grocery (89)—will help to form the edge of the neighborhood, but by and large the boundary of neighborhoods will have to come from a completely different morphological principle.

From observations of neighborhoods that succeed in being well-defined, both physically and in the minds of the townspeople, we have learned that the single most important feature of a neighborhood's boundary is restricted access into the neighborhood: neighborhoods that are successfully defined have definite and relatively few paths and roads leading into them.

For example, here is a map of the Etna Street neighborhood in Berkeley.



Our neighborhood, compared with a typical part of a grid system.

There are only seven roads into this neighborhood, compared with the fourteen which there would be in a typical part of the street grid. The other roads all dead end in T junctions immediately at the edge of the neighborhood. Thus, while the Etna Street neighborhood is not literally walled off from the community, access into it is subtly restricted. The result is that people do not come into the neighborhood by car unless they have

15 NEIGHBORHOOD BOUNDARY

business there; and when people are in the neighborhood, they recognize that they are in a distinct part of town. Of course, the neighborhood was not "created" deliberately. It was an area of Berkeley which has become an identifiable neighborhood because of this accident in the street system.

An extreme example of this principle is the Fuggerei in Augsburg, illustrated in IDENTIFIABLE NEIGHBORHOOD (14). The Fuggerei is entirely bounded by the backs of buildings and walls, and the paths into it are narrow, marked by gateways.

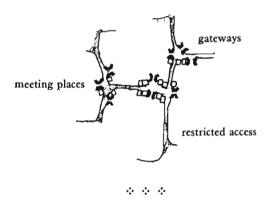
Indeed, if access is restricted, this means, by definition, that those few points where access is possible, will come to have special importance. In one way or another, subtly, or more obviously, they will be gateways, which mark the passage into the neighborhood. We discuss this more fully in MAIN GATEWAYS (53). But the fact is that every successful neighborhood is identifiable because it has some kind of gateways which mark its boundaries: the boundary comes alive in peoples' minds because they recognize the gateways.

In case the idea of gateways seems too closed, we remark at once that the boundary zone—and especially those parts of it around the gateways—must also form a kind of public meeting ground, where neighborhoods come together. If each neighborhood is a self-contained entity, then the community of 7000 which the neighborhoods belong to will not control any of the land internal to the neighborhoods. But it will control all of the land between the neighborhoods—the boundary land—because this boundary land is just where functions common to all 7000 people must find space. In this sense the boundaries not only serve to protect individual neighborhoods, but simultaneously function to unite them in their larger processes.

Therefore:

Encourage the formation of a boundary around each neighborhood, to separate it from the next door neighborhoods. Form this boundary by closing down streets and limiting access to the neighborhood—cut the normal number of streets at least in half. Place gateways at those points where the restricted access paths cross the boundary; and

make the boundary zone wide enough to contain meeting places for the common functions shared by several neighborhoods.



The easiest way of all to form a boundary around a neighborhood is by turning buildings inward, and by cutting off the paths which cross the boundary, except for one or two at special points which become gateways—MAIN GATEWAYS (53); the public land of the boundary may include a park, collector roads, small parking lots, and work communities—anything which forms a natural edge—PARALLEL ROADS (23), WORK COMMUNITY (41), QUIET BACKS (59), ACCESSIBLE GREEN (60), SHIELDED PARKING (97), SMALL PARKING LOTS (103). As for the meeting places in the boundary, they can be any of those neighborhood functions which invite gathering: a park, a shared garage, an outdoor room, a shopping street, a playground—shopping street (32), POOLS AND STREAMS (64), PUBLIC OUTDOOR ROOM (69), GRAVE SITES (70), LOCAL SPORTS (72), ADVENTURE PLAYGROUND (73). . . .

connect communities to one another by encouraging the growth of the following networks:

- 16. WEB OF PUBLIC TRANSPORTATION
- 17. RING ROADS
- 18. NETWORK OF LEARNING
- 19. WEB OF SHOPPING
- 20. MINI-BUSES

16 WEB OF PUBLIC TRANSPORTATION*

. . . the city, as defined by CITY COUNTRY FINGERS (3), spreads out in ribbon fashion, throughout the countryside, and is broken into LOCAL TRANSPORT AREAS (11). To connect the transport areas, and to maintain the flow of people and goods along the fingers of the cities, it is now necessary to create a web of public transportation.



The system of public transportation—the entire web of airplanes, helicopters, hovercraft, trains, boats, ferries, buses, taxis, mini-trains, carts, ski-lifts, moving sidewalks—can only work if all the parts are well connected. But they usually aren't, because the different agencies in charge of various forms of public transportation have no incentives to connect to one another.

Here, in brief, is the general public transportation problem. A city contains a great number of places, distributed rather evenly across a two-dimensional sheet. The trips people want to make are typically between two points at random in this sheet. No one linear system (like a train system), can give direct connections between the vast possible number of point pairs in the city.

It is therefore only possible for systems of public transportation to work, if there are rich connections between a great variety of different systems. But these connections are not workable, unless they are genuine fast, short, connections. The waiting time for a connection must be short. And the walking distance between the two connecting systems must be very short.

This much is obvious; and everyone who has thought about public transportation recognizes its importance. However, obvious though it is, it is extremely hard to implement.

16 WEB OF PUBLIC TRANSPORTATION

There are two practical difficulties, both of which stem from the fact that different kinds of public transportation are usually in the hands of different agencies who are reluctant to cooperate. They are reluctant to cooperate, partly because they are actually in competition, and partly just because cooperation makes life harder for them.

This is particularly true along commuting corridors. Trains, buses, mini-buses, rapid transit, ferries, and maybe even planes and helicopters compete for the same passenger market along these corridors. When each mode is operated by an independent agency there is no particular incentive to provide feeder services to the more inflexible modes. Many services are even reluctant to provide good feeder connections to rapid transit, trains, and ferries, because their commuter lines are their most lucrative lines. Similarly, in many cities of the developing world, minibuses and collectivos provide public transportation along the main commuting corridors, pulling passengers away from buses. This leaves the mainlines served by small vehicles, while almost empty buses reach the peripheral lines, usually because the public bus company is required to serve these areas, even at a loss.

The solution to the web of public transportation, then, hinges on the possibility of solving the coordination problem of the different systems. This is the nut of the matter. We shall now propose a way of solving it. The traditional way of looking at public transportation assumes that lines are primary and that the interchanges needed to connect the lines to one another are secondary. We propose the opposite: namely, that interchanges are primary and that the transport lines are secondary elements which connect the interchanges.

Imagine the following organization: each interchange is run by the community that uses it. The community appoints an interchange chief for every interchange, and gives him a budget, and a directive on service. The interchange chief coordinates the service at his interchange; he charters service from any number of transport companies—the companies, themselves, are in free competition with one another to create service.

In this scheme, responsibility for public transportation shifts from lines to interchanges. The interchanges are responsible for connecting themselves to each other, and the community which uses the interchange decides what kinds of service they want to have passing through it. It is then up to the interchange chief to persuade these transport modes to pass through it.

Slowly, a service connecting interchanges will build up. One example which closely follows our model, and shows that this model is capable of producing a higher level of service than any centralized agency can produce, is the famous Swiss Railway System.

The Swiss railway system . . . is the densest network in the world. At great cost and with great trouble, it has been made to serve the needs of the smallest localities and most remote valleys, not as a paying proposition but because such was the will of the people. It is the outcome of fierce political struggles. In the 19th century, the "democratic railway movement" brought the small Swiss communities into conflict with the big towns, which had plans for centralisation. . . . And if we compare the Swiss system with the French which, with admirable geometrical regularity, is entirely centered on Paris so that the prosperities or the decline, the life or death of whole regions has depended on the quality of the link with the capital, we see the difference between a centralised state and a federal alliance. The railway map is the easiest to read at a glance, but let us now superimpose on it another showing economic activity and the movement of population. The distribution of industrial activity all over Switzerland, even in the outlying areas, accounts for the strength and stability of the social structure of the country and prevented those horrible 19th century concentrations of industry, with their slums and rootless proletariat. (Colin Ward, "The Organization of Anarchy," in Patterns of Anarchy, by Leonard I. Krimerman and Lewis Perry, New York, 1966.)

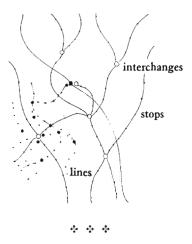
Therefore:

Treat interchanges as primary and transportation lines as secondary. Create incentives so that all the different modes of public transportation—airplanes, helicopters, ferries, boats, trains, rapid transit, buses, mini-buses, skilifts, escalators, travelators, elevators—plan their lines to connect the interchanges, with the hope that gradually many different lines, of many different types, will meet at every interchange.

Give the local communities control over their interchanges so that they can implement the pattern by giving

16 WEB OF PUBLIC TRANSPORTATION

contracts only to those transportation companies which are willing to serve these interchanges.



Keep all the various lines that converge on a single interchange, and their parking, within 600 feet, so that people can transfer on foot—INTERCHANGE (34). It is essential that the major stations be served by a good feeder system, so people are not forced to use private cars at all—MINI-BUSES (20). . . .

17 RING ROADS



... the ring roads which this pattern specifies, help to define and generate the LOCAL TRANSPORT AREAS (II); if they are placed to make connections between INTERCHANGES (34), they also help to form the WEB OF PUBLIC TRANSPORTATION (16).



It is not possible to avoid the need for high speed roads in modern society; but it is essential to place them and build them in such a way that they do not destroy communities or countryside.

Even though the rush of freeways and superhighways built in the 1950's and 1960's is slowing down, because of widespread local protest, we cannot avoid high speed roads altogether. There is, at present, no prospect for a viable alternative which can provide for the vast volume of movement of cars and trucks and buses which a modern city lives on economically and socially.

At the same time, however, high speed roads do enormous damage when they are badly placed. They slice communities in half; they cut off waterfronts; they cut off access to the countryside; and, above all, they create enormous noise. For hundreds of yards, even a mile or two, the noise of every superhighway roars in the background.

To resolve these obvious dilemmas that come with the location and construction of high speed roads, we must find ways of building and locating these roads, so that they do not destroy communities and shatter life with their noise. We can give three requirements that, we believe, go to the heart of this policy:

- I. Every community that has coherence as an area of local transportation—LOCAL TRANSPORT AREAS (II)—is never split by a high speed road, but rather has at least one high speed road adjacent to it. This allows rapid auto travel from one such community out to other communities and to the region at large.
- 2. It must be possible for residents of each local transport area to reach the open countryside without crossing a high speed road—see CITY COUNTRY FINGERS (3). This means, very roughly,

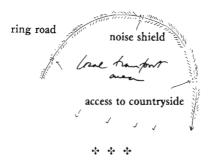
that high speed roads must always be placed in such positions that at least one side of every local transport area has direct access to open country.

3. Most important of all, high speed roads must be shielded acoustically to protect the life around them. This means that they must either be sunken, or shielded by earth berms, parking structures, or warehouses, which will not be damaged by the noise.

Therefore:

Place high speed roads (freeways and other major arteries) so that:

- 1. At least one high speed road lies tangent to each local transport area.
- 2. Each local transport area has at least one side not bounded by a high speed road, but directly open to the countryside.
- 3. The road is always sunken, or shielded along its length by berms, or earth, or industrial buildings, to protect the nearby neighborhoods from noise.



Always place the high speed roads on boundaries between subcultures—subculture boundary (13) and never along waterfronts—ACCESS TO WATER (25). Place industry and big parking garages next to the roads, and use them, whenever possible, as extra noise shields—INDUSTRIAL RIBBONS (42), SHIELDED PARK-ING (C)...

18 NETWORK OF LEARNING*



. . . another network, not physical like transportation, but conceptual, and equal in importance, is the network of learning: the thousands of interconnected situations that occur all over the city, and which in fact comprise the city's "curriculum": the way of life it teaches to its young.

* * *

In a society which emphasizes teaching, children and students—and adults—become passive and unable to think or act for themselves. Creative, active individuals can only grow up in a society which emphasizes learning instead of teaching.

There is no need to add to the criticism of our public schools. The critique is extensive and can hardly be improved on. The processes of learning and teaching, too, have been exhaustively studied. . . . The question now is what to do. (George Dennison, Lives of Children, New York: Vintage Books, 1969, p. 3.)

To date, the most penetrating analysis and proposal for an alternative framework for education comes from Ivan Illich in his book, *De-Schooling Society*, and his article, "Education without Schools: How It Can Be Done," in the *New York Review of Books*, New York, 15 (12): 25-31, special supplement, July 1971.

Illich describes a style of learning that is quite the opposite from schools. It is geared especially to the rich opportunities for learning that are natural to every metropolitan area:

The alternative to social control through the schools is the voluntary participation in society through networks which provide access to all its resources for learning. In fact these networks now exist, but they are rarely used for educational purposes. The crisis of schooling, if it is to have any positive consequence, will inevitably lead to their incorporation into the educational process. . . .

Schools are designed on the assumption that there is a secret to everything in life; that the quality of life depends on knowing that secret; that secrets can be known only in orderly successions; and that only teachers can properly reveal these secrets. An individual with a schooled mind conceives of the world as a pyramid of classified packages accessible only to those who carry the proper tags.

18 NETWORK OF LEARNING

New educational institutions would break apart this pyramid. Their purpose must be to facilitate access for the learner: to allow him to look into the windows of the control room or the parliament, if he cannot get in the door. Moreover, such new institutions should be channels to which the learner would have access without credentials or pedigree—public spaces in which peers and elders outside his immediate horizon now become available. . . .

While network administrators would concentrate primarily on the building and maintenance of roads providing access to resources, the pedagogue would help the student to find the path which for him could lead fastest to his goal. If a student wants to learn spoken Cantonese from a Chinese neighbor, the pedagogue would be available to judge their proficiency, and to help them select the textbook and methods most suitable to their talents, character, and the time available for study. He can counsel the would-be airplane mechanic on finding the best places for apprenticeship. He can recommend books to somebody who wants to find challenging peers to discuss African history. Like the network administrator, the pedagogical counselor conceives of himself as a professional educator. Access to either could be gained by individuals through the use of educational vouchers. . . .

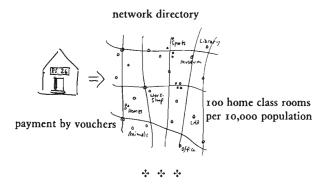
In addition to the tentative conclusions of the Carnegie Commission reports, the last year has brought forth a series of important documents which show that responsible people are becoming aware of the fact that schooling for certification cannot continue to be counted upon as the central educational device of a modern society. Julius Nyere of Tanzania has announced plans to integrate education with the life of the village. In Canada, the Wright Commission on post-secondary education has reported that no known system of formal education could provide equal opportunities for the citizens of Ontario. The president of Peru has accepted the recommendation of his commission on education, which proposes to abolish free schools in favor of free educational opportunities provided throughout life. In fact he is reported to have insisted that this program proceed slowly at first in order to keep teachers in school and out of the way of true educators. (Abridged from pp. 76 and 99 in Deschooling Society by Ivan Illich. Vol. 44 in World Perspectives Series, edited by Ruth Nanda Anshen, New York: Harper & Row, 1971.)

In short, the educational system so radically decentralized becomes congruent with the urban structure itself. People of all walks of life come forth, and offer a class in the things they know and love: professionals and workgroups offer apprenticeships in their offices and workshops, old people offer to teach whatever their life work and interest has been, specialists offer tutoring in their special subjects. Living and learning are the

same. It is not hard to imagine that eventually every third or fourth household will have at least one person in it who is offering a class or training of some kind.

Therefore:

Instead of the lock-step of compulsory schooling in a fixed place, work in piecemeal ways to decentralize the process of learning and enrich it through contact with many places and people all over the city: workshops, teachers at home or walking through the city, professionals willing to take on the young as helpers, older children teaching younger children, museums, youth groups traveling, scholarly seminars, industrial workshops, old people, and so on. Conceive of all these situations as forming the backbone of the learning process; survey all these situations, describe them, and publish them as the city's "curriculum"; then let students, children, their families and neighborhoods weave together for themselves the situations that comprise their "school" paying as they go with standard vouchers, raised by community tax. Build new educational facilities in a way which extends and enriches this network.



Above all, encourage the formation of seminars and workshops in people's homes—HOME WORKSHOP (157); make sure that

18 NETWORK OF LEARNING

each city has a "path" where young children can safely wander on their own—children in the city (57); build extra public "homes" for children, one to every neighborhood at least—children's home (86); create a large number of work-oriented small schools in those parts of town dominated by work and commercial activity—shopfront schools (85); encourage teenagers to work out a self-organized learning society of their own—teenage society (84); treat the university as scattered adult learning for all the adults in the region—university as a marketplace (43); and use the real work of professionals and tradesmen as the basic nodes in the network—master and apprentices (83). . . .

19 WEB OF SHOPPING*

. . . this pattern defines a piecemeal process which can help to locate shops and services where they are needed, in such a way that they will strengthen the MOSAIC OF SUBCULTURES (8), SUBCULTURE BOUNDARIES (13), and the decentralized economy needed for SCATTERED WORK (9) and LOCAL TRANSPORT AREAS (11).



Shops rarely place themselves in those positions which best serve the people's needs, and also guarantee their own stability.

Large parts of towns have insufficient services. New shops which could provide these services often locate near the other shops and major centers, instead of locating themselves where they are needed. In an ideal town, where the shops are seen as part of the society's necessities and not merely as a way of making profit for the shopping chains, the shops would be much more widely and more homogeneously distributed than they are today.

It is also true that many small shops are unstable. Two-thirds of the small shops that people open go out of business within a year. Obviously, the community is not well served by unstable businesses, and once again, their economic instability is largely linked to mistakes of location.

To guarantee that shops are stable, as well as distributed to meet community needs, each new shop must be placed where it will fill a gap among the other shops offering a roughly similar service and also be assured that it will get the threshold of customers which it needs in order to survive. We shall now try to express this principle in precise terms.

The characteristics of a stable system of shops is rather well known. It relies, essentially, on the idea that each unit of shopping has a certain catch basin—the population which it needs in order

19 WEB OF SHOPPING

to survive—and that units of any given type and size will therefore be stable if they are evenly distributed, each one at the center of a catch basin large enough to support it.

Catch basins.

The reason that shops and shopping centers do not always, automatically, distribute themselves according to their appropriate catch basins is easily explained by the situation known as Hotelling's problem. Imagine a beach in summer time—and, somewhere along the beach, an ice-cream seller. Suppose now, that you are also an ice-cream seller. You arrive on the beach. Where should you place yourself in relation to the first ice-cream seller? There are two possible solutions.



Two approaches to the ice-cream problem.

In the first case, you essentially decide to split the beach with the other ice-cream seller. You take half the beach, and leave him half the beach. In this case, you place yourself as far away from him as you can, in a position where half the people on the beach are nearer to you than to him.

In the second case, you place yourself right next to him. You decide, in short, to try and compete with him—and place yourself in such a way as to command the whole beach, not half of it.

Every time a shop, or shopping center opens, it faces a similar choice. It can either locate in a new area where there are no other competing businesses, or it can place itself exactly where all the other businesses are already in the hope of attracting their customers away from them.

The trouble is, very simply, that people tend to choose the second of these two alternatives, because it seems, on the surface, to be safer. In fact, however, the first of the two choices is both better and safer. It is better for the customers, who then have stores to serve them closer to their homes and work places than they do now; and it is safer for the shopkeepers themselves since—in spite of appearances—their stores are much more likely to survive when they stand, without competition, in the middle of a catch basin which needs their services.

Let us now consider the global nature of a web which has this character. In present cities, shops of similar types tend to be clustered in shopping centers. They are forced to cluster, in part because of zoning ordinances, which forbid them to locate in so-called residential areas; and they are encouraged to cluster by their mistaken notion that competition with other shops will serve them better than roughly equal sharing of the available customers. In the "peoples" web we are proposing, shops are far more evenly spread out, with less emphasis on competition and greater emphasis on service. Of course, there will still be competition, enough to make sure that very bad shops go out of business, because each shop will be capable of drawing customers from the nearby catch basins if it offers better service—but the accent is on cooperation instead of competition.



The existing web.

The peoples' web.

19 WEB OF SHOPPING

To generate this kind of homogeneous people's web, it is only necessary that each new shop follow the following three-step procedure when it chooses a location:

- 1. Identify all other shops which offer the service you are interested in; locate them on the map.
- 2. Identify and map the location of potential consumers. Wherever possible, indicate the density or total number of potential consumers in any given area.
- 3. Look for the biggest gap in the existing web of shops in those areas where there are potential consumers.



The gap in services.

Two colleagues of ours have tested the efficiency and potential stability of the webs created by this procedure. ("Computer Simulation of Market Location in an Urban Area," S. Angel and F. Loetterle, CES files, June 1967.) They chose to study markets. They began with a fixed area, a known population density and purchasing power, and a random distribution of markets of different sizes. They then created new markets and killed off old markets according to the following rules. (1) Among all of the existing markets, erase any that do not capture sufficient business to support their given size; (2) among all of the possible locations for a new market, find the one which would most strongly support a new market; (3) find that size for the new market that would be most economically feasible; (4) find that market among all those now existing that is the least economically feasible, and erase it from the web; (5) repeat steps (2) through (4) until no further improvement in the web can be made.

Under the impact of these rules, the random distribution of

markets at the beginning leads gradually to a fluctuating, pulsating distribution of markets which remains economically stable throughout its changes.

Now of course, even if shops of the same kind are kept apart by this procedure, shops of different kinds will tend to cluster. This follows, simply, from the convenience of the shopper. If we follow the rules of location given above—always locating a new shop in the biggest gap in the web of similar shops—then, within that gap there are still quite a large number of different possible places to locate: and naturally, we shall try to locate near the largest cluster of other shops within that gap, to increase the number of people coming past the shop, in short, to make it more convenient for shoppers.

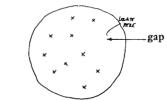
The clusters which emerge have been thoroughly studied by Berry. It turns out that the *levels* of clustering are remarkably similar, even though their spacing varies greatly according to population density. (See *Geography of Market Centers and Retail Distribution*, B. Berry, Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1967, pp. 32-33.) The elements in this web of clustering correspond closely to patterns defined in this language.

Therefore:

When you locate any individual shop, follow a three-step procedure:

- 1. Identify all other shops which offer the service you are interested in; locate them on the map.
- 2. Identify and map the location of potential consumers. Wherever possible, indicate the density or total number of potential consumers in any given area.
- 3. Look for the biggest gap in the existing web of shops in those areas where there are potential consumers.
- 4. Within the gap in the web of similar shops, locate your shop next to the largest cluster of other kinds of shops.

19 WEB OF SHOPPING



shops of same type



We estimate, that under the impact of this rule, a web of shopping with the following overall characteristics will emerge:

	Population	Distance Apart (Miles)
magic of the city (10)	300,000	10*
PROMENADES (31)	50,000	4*
SHOPPING STREETS (32)	10,000	1.8*
markets of many shops (46)	4,000	1.1*
CORNER GROCERIES (89)	1,000	0.5*

^{*} These distances are calculated for an overall population density of 5000 per square mile. For a population density of D persons/square mile, divide the distances by $\sqrt{D/5000}$

20 MINI-BUSES*

. . . this pattern helps complete the LOCAL TRANSPORT AREAS (II) and the WEB OF PUBLIC TRANSPORTATION (I6). The local transport areas rely heavily on foot traffic, and on bikes and carts and horses. The web of public transportation relies on trains and planes and buses. Both of these patterns need a more flexible kind of public transportation to support them.



Public transportation must be able to take people from any point to any other point within the metropolitan area.

Buses and trains, which run along lines, are too far from most origins and destinations to be useful. Taxis, which can go from point to point, are too expensive.

To solve the problem, it is necessary to have a kind of vehicle which is half way between the two—half like a bus, half like a taxi—a small bus which can pick up people at any point and take them to any other point, but which may also pick up other passengers on the way, to make the trip less costly than a taxi fare.

Recent research, and full-scale experiments, have shown that a system of mini-buses, on call by telephone, can function in this fashion, taking people from door to door in 15 minutes, for no more than 50 cents a ride (1974): and that the system is efficient enough to support itself. It works just like a taxi, except that it picks up and drops off other passengers while you are riding; it goes to the nearest corner to save time—not to your own front door; and it costs a quarter of an average taxi fare.

The system hinges, to a certain extent, on the development of sophisticated new computer programs. As calls come in, the computer examines the present movements of all the various minibuses, each with its particular load of passengers, and decides which bus can best afford to pick up the new passenger, with the least detour. Two-way radio contact keeps the mini-buses in communication with the dispatcher at the computer switchboard. All this, and other details, are discussed fully in a review of current

20 MINI-BUSES



Canadian mini-bus.

dial-a-bus research: Summary Report—The Dial-a-Ride Transportation System, M.I.T. Urban Systems Laboratory, Report # USL-TR-70-10, March 1971.

Dial systems for buses are actually coming into existence now because they are economically feasible. While conventional fixed-route public transport systems are experiencing a dangerous spiral of lower levels of service, fewer passengers, and increased public subsidies, over 30 working dial-a-bus systems are presently in successful operation throughout the world. For example, a dial-a-bus system in Regina, Saskatchewan, is the only part of the Regina Transit System which supports itself (Regina Telebus Study: Operations Report, and Financial Report, W. G. Atkinson et al., June 1972). In Batavia, New York, dial-a-bus is the sole means of public transport, serving a population of 16,000 at fares of 40 to 60 cents per ride.

We finish this pattern by reminding the reader of two vital problems of public transportation, which underline the importance of the mini-bus approach.

First, there are very large numbers of people in cities who cannot drive; we believe the mini-bus system is the only realistic way of meeting the needs of all these people.

Their numbers are much larger than one would think. They are, in effect, a silent minority comprising the uncomplaining old and physically handicapped, the young and the poor. In 1970, over 20 percent of U.S. households did not own a car. Fifty-seven and five-tenths percent of all households with incomes under \$3000 did not own a car. For households headed by persons 65 years of age or older, 44.9 percent did not own a car. Of the youths between 10 and 18 years of age, 80 percent are dependent on others, including public

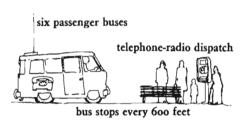
TOWNS

transit, for their mobility. Among the physically disabled about 5.7 million are potential riders of public transportation if the system could take them door-to-door. (Sumner Myers, "Turning Transit Subsidies into 'Compensatory Transportation,'" City, Vol. 6, No. 3, Summer 1972, p. 20.)

Second, quite apart from these special needs, the fact is that a web of public transportation, with large buses, boats, and trains, will not work anyway, without a mini-bus system. The large systems need feeders: some way of getting to the stations. If people have to get in their cars to go to the train, then, once in the car, they stay in it and do not use the train at all. The mini-bus system is essential for the purpose of providing feeder service in the larger web of public transportation.

Therefore:

Establish a system of small taxi-like buses, carrying up to six people each, radio-controlled, on call by telephone, able to provide point-to-point service according to the passengers' needs, and supplemented by a computer system which guarantees minimum detours, and minimum waiting times. Make bus stops for the mini-buses every 600 feet in each direction, and equip these bus stops with a phone for dialing a bus.

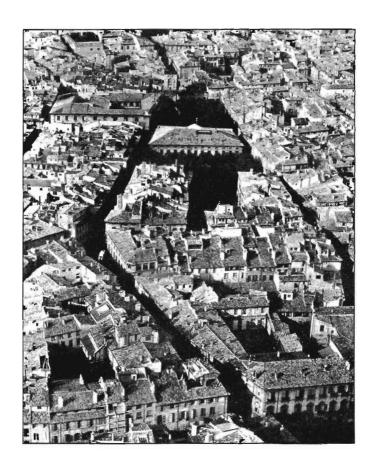


Place the bus stops mainly along major roads, as far as this can be consistent with the fact that no one ever has to walk more than 600 feet to the nearest one—PARALLEL ROADS (23); put one in every INTERCHANGE (34); and make each one a place where a few minutes' wait is pleasant—BUS STOP (92). . . .

establish community and neighborhood policy to control the character of the local environment according to the following fundamental principles:

- 21. FOUR-STORY LIMIT
- 22. NINE PER CENT PARKING
- 23. PARALLEL ROADS
- 24. SACRED SITES
- 25. ACCESS TO WATER
- 26. LIFE CYCLE
- 27. MEN AND WOMEN

2 I FOUR-STORY LIMIT**



will, in general, be rather higher toward the center and lower toward the edges—city country fingers (3), lace of country streets (5), magic of the city (10). However, throughout the city, even at its densest points, there are strong human reasons to subject all buildings to height restrictions.



There is abundant evidence to show that high buildings make people crazy.

High buildings have no genuine advantages, except in speculative gains for banks and land owners. They are not cheaper, they do not help create open space, they destroy the townscape, they destroy social life, they promote crime, they make life difficult for children, they are expensive to maintain, they wreck the open spaces near them, and they damage light and air and view. But quite apart from all of this, which shows that they aren't very sensible, empirical evidence shows that they can actually damage people's minds and feelings.



"The Ministry of Truth—Minitrue, in Newspeak—was startlingly different from any other object in sight. It was an enormous pyramidal structure of glittering white concrete, soaring up terrace after terrace 300 metres in the air." (George Orwell, 1984)

There are two separate bodies of evidence for this. One shows the effect of high-rise housing on the mental and social well being of families. The other shows the effect of large buildings, and high buildings, on the human relations in offices and workplaces. We present the first of these two bodies of evidence in the text which follows. The second, concerning offices and workplaces, we have placed in BUILDING COMPLEX (95), since it has implications not just for the height of buildings but also for their total volume.

We wish to stress, however, that the seemingly one-sided concern with housing in the paragraphs which follow, is only apparent. The underlying phenomenon—namely, mental disorder and social alienation created by the height of buildings—occurs equally in housing and in workplaces.

The strongest evidence comes from D. M. Fanning ("Families in Flats," British Medical Journal, November 18, 1967, pp. 382-86). Fanning shows a direct correlation between incidence of mental disorder and the height of people's apartments. The higher people live off the ground, the more likely are they to suffer mental illness. And it is not simply a case of people prone to mental illness choosing high-rise apartments. Fanning shows that the correlation is strongest for the people who spend the most time in their apartments. Among the families he studied, the correlation was strongest for women, who spend the most time in their apartments; it was less strong for children, who spend less time in the apartments; and it was weakest for men, who spend the least amount of time in their apartments. This strongly suggests that sheer time spent in the high-rise is itself what causes the effect.

A simple mechanism may explain this: high-rise living takes people away from the ground, and away from the casual, everyday society that occurs on the sidewalks and streets and on the gardens and porches. It leaves them alone in their apartments. The decision to go out for some public life becomes formal and awkward; and unless there is some specific task which brings people out in the world, the tendency is to stay home, alone. The forced isolation then causes individual breakdowns.

Fanning's findings are reinforced by Dr. D. Cappon's clinical experiences reported in "Mental Health and the High Rise," Canadian Public Health Association, April 1971:

21 FOUR-STORY LIMIT

There is every reason to believe that high-rise apartment dwelling has adverse effects on mental and social health. And there is sufficient clinical, anecdotal and intuitive observations to back this up. Herewith, in no particular order ranking, a host of factors:

In my experience as Mental Health Director in a child guidance clinic in York Township, Toronto, for 5 years, I saw numerous children who had been kinetically deprived . . . and kinetic deprivation is the worst of the perceptual, exploratory kinds, for a young child, leaving legacies of lethargy, or restlessness, antisocial acting out or withdrawal, depersonalization or psychopathy.

Young children in a high-rise are much more socially deprived of neighborhood peers and activities than their S.F.D. (Single Family Dwelling) counterparts, hence they are poorly socialized and at too close quarters to adults, who are tense and irritable as a consequence.

Adolescents in a high-rise suffer more from the "nothing-to-do" ennui than those of a S.F.D., with enhanced social needs for "drop in centres" and a greater tendency to escapism. . . .

Mothers are more anxious about their very young ones, when they can't see them in the street below, from a convenient kitchen window.

There is higher passivity in the high-rise because of the barriers to active outlets on the ground; such barriers as elevators, corridors; and generally there is a time lapse and an effort in negotiating the vertical journey. TV watching is extended in the high-rise. This affects probably most adversely the old who need kinesia and activity, in proportion, as much as the very young do. Though immobility saves them from accidents, it also shortens their life in a high-rise. . . .

A Danish study by Jeanne Morville adds more evidence (Borns Brug af Friarsaler, Disponering Af Friarsaler, Etageboligomrader Med Saerlig Henblik Pa Borns Legsmuligheder, S.B.I., Denmark, 1969):

Children from the high blocks start playing out of doors on their own at a later age than children from the low blocks: Only 2% of the children aged two to three years in the high point blocks play on their own out of doors, while 27% of the children in the low blocks do this.

Among the children aged five years in the high point blocks 29% do not as yet play on their own out of doors, while in the low blocks all the children aged five do so. . . . The percentage of young children playing out of doors on their own decreases with the height of their homes; 90% of all the children from the three lower floors in the high point blocks play on their own out of doors, while only 59% of the children from the three upper floors do so. . . .

Young children in the high blocks have fewer contacts with playmates than those in the low blocks: Among children aged one, two and three years, 86% from the low blocks have daily contact with

playmates; this applies to only 29% from the high blocks.

TOWNS

More recently, there is the evidence brought forward by Oscar Newman in *Defensible Space*. Newman compared two adjacent housing projects in New York—one high-rise, the other a collection of relatively small three-story walk-up buildings. The two projects have the same overall density, and their inhabitants have roughly the same income. But Newman found that the crime rate in the high-rise was roughly twice that in the walk-ups.

At what height do the effects described by Fanning, Cappon, Morville, and Newman begin to take hold? It is our experience that in both housing and office buildings, the problems begin when buildings are more than four stories high.

At three or four stories, one can still walk comfortably down to the street, and from a window you can still feel part of the street scene: you can see details in the street—the people, their faces, foliage, shops. From three stories you can yell out, and catch the attention of someone below. Above four stories these connections break down. The visual detail is lost; people speak of the scene below as if it were a game, from which they are completely detached. The connection to the ground and to the fabric of the town becomes tenuous; the building becomes a world of its own: with its own elevators and cafeterias.

We believe, therefore, that the "four-story limit" is an appropriate way to express the proper connection between building height and the health of a people. Of course, it is the spirit of the pattern which is most essential. Certainly, a building five stories high, perhaps even six, might work if it were carefully handled. But it is difficult. On the whole, we advocate a four-story limit, with only occasional departures, throughout the town.

Finally, we give the children of Glasgow the last word.

To fling a "piece," a slice of bread and jam, from a window down to a child in the street below has been a recognised custom in Glasgow's tenement housing. . . .

THE JEELY PIECE SONG by Adam McNaughton

I'm a skyscraper wean, I live on the nineteenth flair, On' I'm no' gaun oot tae play ony mair, For since we moved tae oor new hoose I'm wastin' away, 'Cos I'm gettin' wan less meal ev'ry day,

21 FOUR-STORY LIMIT

Refrain

Oh, ye canny fling pieces oot a twenty-storey flat, Seven hundred hungry weans will testify tae that, If it's butter, cheese or jeely, if the breid is plain or pan, The odds against it reachin' us is ninety-nine tae wan.

.

We've wrote away tae Oxfam tae try an' get some aid, We've a' joined thegither an' formed a "piece" brigade, We're gonny march tae London tae demand oor Civil Rights, Like "Nae mair hooses ower piece flingin' heights."

Therefore:

In any urban area, no matter how dense, keep the majority of buildings four stories high or less. It is possible that certain buildings should exceed this limit, but they should never be buildings for human habitation.



Within the framework of the four-story limit the exact height of individual buildings, according to the area of floor they need, the area of the site, and the height of surrounding buildings, is given by the pattern NUMBER OF STORIES (96). More global variations of density are given by DENSITY RINGS (29). The horizontal subdivision of large buildings into smaller units, and separate smaller buildings, is given by BUILDING COMPLEX (95). HOUSING HILL (39) and OFFICE CONNECTIONS (82) help to shape multi-storied apartments and offices within the constraints of a four-story limit. And finally, don't take the four-story limit too literally. Occasional exceptions from the general rule are very important—HIGH PLACES (62). . . .

22 NINE PER CENT PARKING**



. . . the integrity of local transport areas and the tranquility of local communities and neighborhoods depend very much on the amount of parking they provide. The more parking they provide, the less possible it will be to maintain these patterns, because the parking spaces will attract cars, which in turn violate the local transport areas and neighborhoods—LOCAL TRANSPORT AREAS (11), COMMUNITY OF 7000 (12), IDENTIFIABLE NEIGHBORHOOD (14). This pattern proposes radical limits on the distribution of parking spaces, to protect communities.



Very simply—when the area devoted to parking is too great, it destroys the land.



In downtown Los Angeles over 60 per cent of the land is given over to the automobile.

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 per cent of it is given to parking.

Our observations are very tentative. We have yet to perform systematic studies—our observations rely on our own subjective estimates of cases where "there are too many cars" and cases where "the cars are all right." 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.

An example of an environment which has the threshold density of 9 per cent parking, is shown in our key photograph: a quadrant of the University of Oregon. Many people we have talked to feel intuitively that this area is beautiful now, but that if more cars were parked there it would be ruined.

What possible functional basis is there for this intuition? We conjecture as follows: people realize, subconsciously, that the physical 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 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 the outdoors is not meant for them, 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.

We conjecture, then, that environments which are human, and not destroyed socially or ecologically by the presence of parked cars, have less than 9 per cent of the ground area devoted to parking space; and that parking lots and garages must therefore never be allowed to cover more than 9 per cent of the land.

It is essential to interpret this pattern in the strictest possible way. The pattern becomes meaningless if we allow ourselves to place the parking generated by a piece of land A, on another adjacent piece of land B, thus keeping parking on A below 9 per

22 NINE PER CENT PARKING

cent, but raising the parking on B to more than 9 per cent. 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. A town or a community can only implement the pattern according to this strict interpretation by defining a grid of independent "parking zones"—each zone I to 10 acres in area—which cover the whole community, and then insisting that the rule be applied, independently, and strictly, inside every parking zone.

The 9 per cent 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 per cent of the land if it were all in surface parking. To keep 20 cars per acre in line with the 9 per cent rule, at least half of them will have to be parked in garages. The table below gives similar figures for different densities:

Cars per acre	Per cent on surface	Per cent in two story garages	Per cent in three story garages
I 2	100		
17	50	50	_
23	50		50
30		_	100

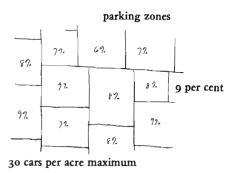
What about underground parking? May we consider it as an exception to this rule? Only if it does not violate or restrict the use of the land above. If, for example, a parking garage is under a piece of land which was previously used as open space, with great trees growing on it, then the garage will almost certainly change the nature of the space above, because it will no longer be possible to grow large trees there. Such a parking garage is a violation of the land. Similarly, if the structural grid of the garage—60 foot bays—constrains the structural grid of the building above, so that this building is not free to express its needs, this is a violation too. Underground parking may be allowed only in those rare cases where it does not constrain the land above at all: under a major road, perhaps, or under a tennis court.

We see then, that the 9 per cent rule has colossal implications.

Since underground parking will only rarely satisfy the conditions we have stated, the pattern really says that almost no part of the urban area may have more than 30 parking spaces per acre. This will create large changes in the central business district. Consider a part of a typical downtown area. There may be several hundred commuters per acre working there; and, under today's conditions, many of them park their cars in garages. But if it is true that there cannot be more than 30 parking spaces per acre, then either the work will be forced to decentralize, or the workers will have to rely on public transportation. It seems, in short, that this simple pattern, based on the social psychology of the environment, leads us to the same far reaching social conclusions as the patterns web of public transportation (16) and scattered work (9).

Therefore:

Do not allow more than 9 per cent of the land in any given area to be used for parking. In order to prevent the "bunching" of parking in huge neglected areas, it is necessary for a town or a community to subdivide its land into "parking zones" no larger than 10 acres each and to apply the same rule in each zone.

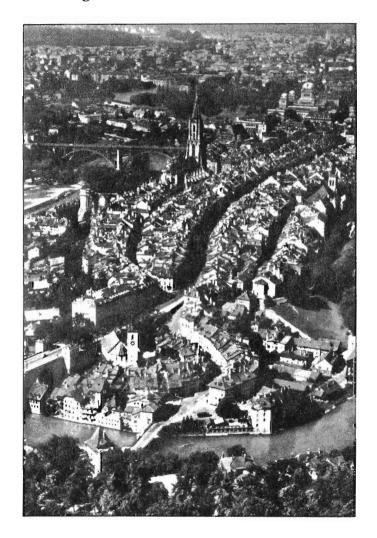


Two later patterns say that parking must take one of two forms: tiny, surface parking lots, or shielded parking structures—

22 NINE PER CENT PARKING

SHIELDED PARKING (97), SMALL PARKING LOTS (103). If you accept these patterns the 9 per cent rule will put an effective upper limit of 30 parking spaces per acre, on every part of the environment. Present-day on-street parking, with driveways, which provides spaces for about 35 cars per acre on the ground is ruled out. And those present-day high density business developments which depend on the car are also ruled out. . . .

23 PARALLEL ROADS



. . . in earlier patterns, we have proposed that cities should be subdivided into local transport areas, whose roads allow cars to move in and out from the ring roads, but strongly discourage internal movement across the area—LOCAL TRANSPORT AREAS (11), RING ROADS (17)—and that these transport areas themselves be further subdivided into communities and neighborhoods, with the provision that all major roads are in the boundaries between communities and neighborhoods—subculture boundary (13), NEIGHBORHOOD BOUNDARY (15). Now, what should the arrangement of these roads be like, to help the flow required by LOCAL TRANSPORT AREAS (11), and to maintain the boundaries?



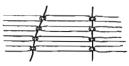
The net-like pattern of streets is obsolete. Congestion is choking cities. Cars can average 60 miles per hour on freeways, but trips across town have an average speed of only 10 to 15 miles per hour.

Certainly, in many cases, we want to get rid of cars, not help them to go faster. This is fully discussed in LOCAL TRANSPORT AREAS (II). But away from the areas where children play and people walk or use their bikes, there still need to be certain streets which carry cars. The question is: How can these streets be designed to carry the cars faster and without congestion?

It turns out that the loss of speed on present city streets is caused mainly by crossing movements: left-hand turns across traffic and four-way intersections. (G. F. Newell, "The Effect of Left Turns on the Capacity of Traffic Intersection," Quarterly of Applied Mathematics, XVII, April 1959, pp. 67-76.)

To speed up traffic it is therefore necessary to create a network of major roads in which there are no four-way intersections, and no left-hand turns across traffic. This can easily be done if the major roads are alternating, one-way parallel roads, a few hundred feet apart, with smaller local roads opening off them, and the only connections between the parallel roads given by larger freeways crossing them at two- or three-mile intervals.

TOWNS



Parallel roads.

This pattern has been discussed at considerable length in three papers ("The Pattern of Streets," C. Alexander, AIF Journal, September 1966; Criticisms by D. Carson and P. Roosen-Runge, and Alexander's reply, in AIP Journal, September 1967.) We refer the reader to these original papers for the full derivation of all the geometric details. Our present statement is a radically condensed version. Here we concentrate mainly on one puzzling question—that of detours—because this is for many people the most surprising aspect of the full analysis.

The pattern of parallel roads—since it contains no major cross streets—creates many detours not present in today's net-like pattern. At first sight it seems likely that these detours will be impossibly large. However, in the papers mentioned above it is shown in detail that they are in fact perfectly reasonable. We summarize the argument below.

It is possible to calculate the probable detour for any trip of a given length through this proposed parallel road system as a function of the distance between the cross roads. Next, the probability of any given trip length may be obtained from actual studies of metropolitan auto trips. These two types of probabilities can finally be combined to yield an overall mean trip length and overall mean detours as shown below.

Trip Length, miles	I	2	3	4	5	7	10	4.12
Proportion of Trip Lengths %*	28	ΙI	11	9	9	24	8	(Overall Mean Trip Length)
miles between cross roads		M	ean I	Detou	r, mi	les		Overall Mean Detour
I	. 1 2	.05	.04	.03	.02	.01	.01	.05
2	.45	.24	.15	. 1 1	.09	.07	.04	.21
3	.79	.58	.36	.25	.20	.15	.11	.41

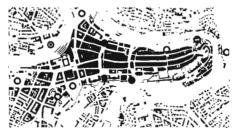
* Data for distribution of trip lengths was obtained from Edward M. Hall, "Travel Characteristics of Two San Diego Suburban Developments," *Highway Research Board Bulletin* 2039, Washington, D. C., 1958, pp. 1-19, Figure 11. These data are typical for metropolitan areas all over the Western world.

23 PARALLEL ROADS

We see, therefore, that even with cross roads two miles apart, the lack of cross streets only increases trip lengths by 5 per cent. At the same time, the average speed of trips will increase from 15 miles per hour to about 45 miles per hour, a threefold increase. The huge savings in time and fuel costs will more than offset the slight increase in distance.

Referring back for a moment to the table of detours, it will be noticed that the highest detours occur for the shortest trips. We have argued elsewhere—LOCAL TRANSPORT AREAS (II)—that to preserve the quality of the city's environment it is necessary to discourage the use of the automobile for very short trips, and to encourage walking, bikes, buses, and horses instead. The pattern of parallel roads has precisely the feature which local transport areas need. It makes longer trips vastly more efficient, while discouraging the very short auto trips, and so provides the local transport area with just the internal structure which it needs to support its function.

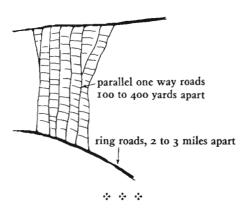
Although this pattern seems strange at first sight, it is in fact already happening in many parts of the world and has already proved its worth. For example, Berne, Switzerland, is one of the few cities in Europe that does not suffer from acute traffic congestion. When one looks at a map of Berne, one can see that its old center is formed by five long parallel roads with almost no cross streets. We believe that it has little congestion in the old center precisely because it contains the pattern. In many large cities today, the same insight is being implemented piecemeal—in the form of more and more one-way streets: in New York the alternating one-way Avenues, in downtown San Francisco the one-way major streets.



Berne's five main parallel streets.

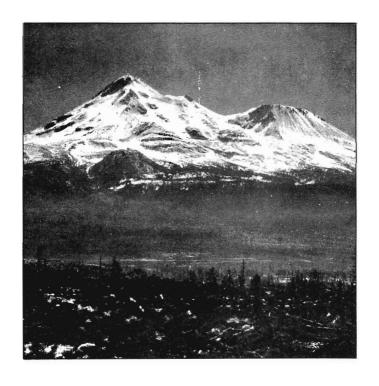
Therefore:

Within a local transport area build no intersecting major roads at all; instead, build a system of parallel and alternating one-way roads to carry traffic to the RING ROADS (17). In existing towns, create this structure piecemeal, by gradually making major streets one-way and closing cross streets. Keep parallel roads at least 100 yards apart (to make room for neighborhoods between them) and no more than 300 or 400 yards apart.



The parallel roads are the only through roads in a LOCAL TRANSPORT AREA (II). For access from the parallel roads to public buildings, house clusters, and individual houses use safe, slow, narrow roads which are not through roads—Looped Local Roads (49), GREEN STREETS (51)—and make their intersections with the parallel roads a "T"—T JUNCTION (50). Keep the pedestrian path system at right angles to the parallel roads, and raised above them where the two must run parallel—NETWORK OF PATHS AND CARS (52), RAISED WALK (55). Provide a ROAD CROSSING (54) where paths cross the parallel roads.

24 SACRED SITES*



. . . in every region and every town, indeed in every neighborhood, there are special places which have come to symbolize the area, and the people's roots there. These places may be natural beauties or historic landmarks left by ages past. But in some form they are essential.



People cannot maintain their spiritual roots and their connections to the past if the physical world they live in does not also sustain these roots.

Informal experiments in our communities have led us to believe that people agree, to an astonishing extent, about the sites which do embody people's relation to the land and to the past. It seems, in other words, as though "the" sacred sites for an area exist as objective communal realities.

If this is so, it is then of course essential that these specific sites be preserved and made important. Destruction of sites which have become part of the communal consciousness, in an agreed and widespread sense, must inevitably create gaping wounds in the communal body.

Traditional societies have always recognized the importance of these sites. Mountains are marked as places of special pilgrimage; rivers and bridges become holy; a building or a tree, or rock or stone, takes on the power through which people can connect themselves to their own past.

But modern society often ignores the psychological importance of these sites. They are bulldozed, developed, changed, for political and economic reasons, without regard for these simple but fundamental emotional matters; or they are simply ignored.

We suggest the following two steps.

- I. In any geographic area—large or small—ask a large number of people which sites and which places make them feel the most contact with the area; which sites stand most for the important values of the past, and which ones embody their connection to the land. Then insist that these sites be actively preserved.
 - 2. Once the sites are chosen and preserved, embellish them in

24 SACRED SITES

a way which intensifies their public meaning. We believe that the best way to intensify a site is through a progression of areas which people pass through as they approach the site. This is the principle of "nested precincts," discussed in detail under the pattern HOLY GROUND (66).

A garden which can be reached only by passing through a series of outer gardens keeps its secrecy. A temple which can be reached only by passing through a sequence of approach courts is able to be a special thing in a man's heart. The magnificence of a mountain peak is increased by the difficulty of reaching the upper valleys from which it can be seen; the beauty of a woman is intensified by the slowness of her unveiling; the great beauty of a river bank—its rushes, water rats, small fish, wild flowers—are violated by a too direct approach; even the ecology cannot stand up to the too direct approach—the thing will simply be devoured.

We must therefore build around a sacred site a series of spaces which gradually intensify and converge on the site. The site itself becomes a kind of inner sanctum, at the core. And if the site is very large—a mountain—the same approach can be taken with special places from which it can be seen—an inner sanctum, reached past many levels, which is not the mountain, but a garden, say, from which the mountain can be seen in special beauty.

Therefore:

Whether the sacred sites are large or small, whether they are at the center of the towns, in neighborhoods, or in the deepest countryside, establish ordinances which will protect them absolutely—so that our roots in the visible surroundings cannot be violated.

sacred sites

acts of preservation



Give every sacred site a place, or a sequence of places, where people can relax, enjoy themselves, and feel the presence of the place—QUIET BACKS (59), ZEN VIEW (134), TREE PLACES (171), GARDEN SEAT (176). And above all, shield the approach to the site, so that it can only be approached on foot, and through a series of gateways and thresholds which reveal it gradually—HOLY GROUND (66). . . .

25 ACCESS TO WATER*



. . . water is always precious. Among the special natural places covered by SACRED SITES (24), we single out the ocean beaches, lakes, and river banks, because they are irreplaceable. Their maintenance and proper use require a special pattern.



People have a fundamental yearning for great bodies of water. But the very movement of the people toward the water can also destroy the water.

Either roads, freeways, and industries destroy the water's edge and make it so dirty or so treacherous that it is virtually inaccessible; or when the water's edge is preserved, it falls into private hands.



Access to water is blocked.

But the need that people have for water is vital and profound. (See, for example, C. G. Jung, Symbols of Transformation, where Jung takes bodies of water which appear in dreams as a consistent representation of the dreamer's unconscious.)

The problem can be solved only if it is understood that people will build places *near* the water because it is entirely natural; but that the land immediately along the water's edge must be preserved for common use. To this end the roads which can destroy the water's edge must be kept back from it and only allowed near it when they lie at right angles to it.

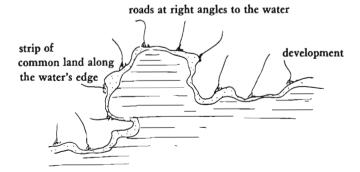


Life forms around the water's edge.

The width of the belt of land along the water may vary with the type of water, the density of development along it, and the ecological conditions. Along high density development, it may be no more than a simple stone promenade. Along low density development, it may be a common parkland extending hundreds of yards beyond a beach.

Therefore:

When natural bodies of water occur near human settlements, treat them with great respect. Always preserve a belt of common land, immediately beside the water. And allow dense settlements to come right down to the water only at infrequent intervals along the water's edge.





The width of the common land will vary with the type of water and the ecological conditions. In one case, it may be no more than a simple stone promenade along a river bank a few feet wide—PROMENADE (31). In another case, it may be a swath of dunes extending hundreds of yards beyond a beach—THE COUNTRYSIDE (7). In any case, do not build roads along the water within one mile of the water; instead, make all the approach roads at right angles to the edge, and very far apart—PARALLEL ROADS (23). If parking is provided, keep the lots small—SMALL PARKING LOTS (103). . . .

26 LIFE CYCLE*



. . . a real community provides, in full, for the balance of human experience and human life—community of 7000 (12). To a lesser extent, a good neighborhood will do the same—IDENTIFIABLE NEIGHBORHOOD (14). To fulfill this promise, communities and neighborhoods must have the range of things which life can need, so that a person can experience the full breadth and depth of life in his community.



All the world's a stage, And all the men and women merely players: They have their exits and their entrances; And one man in his time plays many parts, His acts being seven ages.

As, first the infant, Mewling and puking in the nurse's arms. And then the whining schoolboy, with his satchel And shining morning face, creeping like snail Unwillingly to school, And then the lover, Sighing like furnace, with a woeful ballad Made to his mistress' eyebrow. Then the soldier, Full of strange oaths, and bearded like the pard, Jealous in honour, sudden and quick in quarrel, Seeking the bubble reputation Even in the cannon's mouth. And then the justice, In fair round belly with good capon lined, With eyes severe and beard of formal cut, Full of wise saws and modern instances; And so he plays his part. The sixth age shifts Into the lean and slipper'd pantaloon, With spectacles on nose and pouch on side; His youthful hose, well saved, a world too wide For his shrunk shank; and his big manly voice, Turning again toward childish treble, pipes And whistles in his sound. Last scene of all, That ends this strange eventful history, Is second childishness and mere oblivion, Sans teeth, sans eyes, sans taste, sans every thing. (Shakespeare, As You Like It, II.viii.)

To live life to the fullest, in each of the seven ages, each age must be clearly marked, by the community, as a distinct wellmarked time. And the ages will only seem clearly marked if the

26 LIFE CYCLE

ceremonies which mark the passage from one age to the next are firmly marked by celebrations and distinctions.

By contrast, in a flat suburban culture the seven ages are not at all clearly marked; they are not celebrated; the passages from one age to the next have almost been forgotten. Under these conditions, people distort themselves. They can neither fulfill themselves in any one age nor pass successfully on to the next. Like the sixty-year-old woman wearing bright red lipstick on her wrinkles, they cling ferociously to what they never fully had.

This proposition hinges on two arguments.

- A. The cycle of life is a definite psychological reality. It consists of discrete stages, each one fraught with its own difficulties, each one with its own special advantages.
- B. Growth from one stage to another is not inevitable, and, in fact, it will not happen unless the community contains a balanced life cycle.

A. The Reality of the Life Cycle.

Everyone can recognize the fact that a person's life traverses several stages—infancy to old age. What is perhaps not so well understood is the idea that each stage is a discrete reality, with its own special compensations and difficulties; that each stage has certain characteristic experiences that go with it.

The most inspired work along these lines has come from Erik Erikson: "Identity and the Life Cycle," in *Psychological Issues*, Vol. 1, No. 1, New York: International Universities Press, 1959; and *Childhood and Society*, New York: W. W. Norton, 1950.

Erikson describes the sequence of phases a person must pass through as he matures and suggests that each phase is characterized by a specific developmental task—a successful resolution of some life conflict—and that this task must be solved by a person before he can move wholeheartedly forward to the next phase. Here is a summary of the stages in Erikson's scheme, adapted from his charts:

- 1. Trust vs. mistrust: the infant; relationship between the infant and mother; the struggle for confidence that the environment will nourish.
- 2. Autonomy vs. shame and doubt: the very young child; relationship between the child and parents; the struggle to stand on

one's own two feet, to find autonomy in the face of experiences of shame and doubt as to one's capacity for self-control.

- 3. Initiative vs. guilt: the child; relationship to the family, the ring of friends; the search for action, and the integrity of one's acts; to make and eagerly learn, checked by the fear and guilt of one's own aggressions.
- 4. Industry vs. inferiority: the youngster; relationship to the neighborhood, the school; adaptation to the society's tools; the sense that one can make things well, alone, and with others, against the experience of failure, inadequacy.
- 5. Identity vs. identity diffusion: youth, adolescence; relationship to peers and "outgroups" and the search for models of adult life; the search for continuity in one's own character against confusion and doubt; a moratorium; a time to find and ally oneself with creeds and programs of the world.
- 6. Intimacy vs. isolation: young adults; partners in friendship, sex, work; the struggle to commit oneself concretely in relations with others; to lose and find oneself in another, against isolation and the avoidance of others.
- 7. Generativity vs. stagnation: adults; the relationship between a person and the division of labor, and the creation of a shared household; the struggle to establish and guide, to create, against the failure to do so, and the feelings of stagnation.
- 8. Integrity vs. despair: old age; the relationship between a person and his world, his kind, mankind; the achievement of wisdom; love for oneself and one's kind; to face death openly, with the forces of one's life integrated; vs. the despair that life has been useless.

B. But growth through the life cycle is not inevitable.

It depends on the presence of a balanced community, a community that can sustain the give and take of growth. Persons at each stage of life have something irreplaceable to give and to take from the community, and it is just these transactions which help a person to solve the problems that beset each stage. Consider the case of a young couple and their new child. The connection between them is entirely mutual. Of course, the child "depends" on the parents to give the care and love that is required to resolve the conflict of trust that goes with infancy. But simultaneously,

26 LIFE CYCLE

the child gives the parents the experience of raising and bearing, which helps them to meet their conflict of generativity, unique to adulthood.

We distort the situation if we abstract it in such a way that we consider the parent as "having" such and such a personality when the child is born and then, remaining static, impinging upon a poor little thing. For this weak and changing little being moves the whole family along. Babies control and bring up their families as much as they are controlled by them; in fact, we may say that the family brings up a baby by being brought up by him. Whatever reaction patterns are given biologically and whatever schedule is predetermined developmentally must be considered to be a series of potentialities for changing patterns of mutual regulation. [Erikson, ibid. p. 69.]

Similar patterns of mutual regulation occur between the very old and the very young; between adolescents and young adults, children and infants, teenagers and younger teenagers, young men and old women, young women and old men, and so on. And these patterns must be made viable by prevailing social institutions and those parts of the environment which help to maintain them—the schools, nurseries, homes, cafes, bedrooms, sports fields, workshops, studios, gardens, graveyards. . . .

We believe, however, that the balance of settings which allow normal growth through the life cycle has been breaking down. Contact with the entire cycle of life is less and less available to each person, at each moment in time. In place of natural communities with a balanced life cycle we have retirement villages, bedrooms suburbs, teenage culture, ghettos of unemployed, college towns, mass cemeteries, industrial parks. Under such conditions, one's chances for solving the conflict that comes with each stage in the life cycle are slim indeed.

To re-create a community of balanced life cycles requires, first of all, that the idea take its place as a principal guide in the development of communities. Each building project, whether the addition to a house, a new road, a clinic, can be viewed as either helping or hindering the right balance for local communities. We suspect that the community repair maps, discussed in The Oregon Experiment, Chapter V (Volume 3 in this series), can play an especially useful role in helping to encourage the growth of a balanced life cycle.

But this pattern can be no more than an indication of work

TOWNS

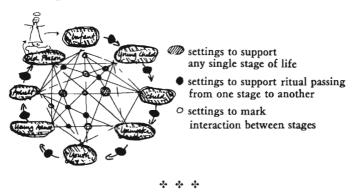
that needs to be done. Each community must find ways of taking stock of its own relative "balance" in this respect, and then define a growth process which will move it in the right direction. This is a tremendously interesting and vital problem; it needs a great deal of development, experiment, and theory. If Erikson is right, and if this kind of work does not come, it seems possible that the development of trust, autonomy, initiative, industry, identity, intimacy, generativity, integrity may disappear entirely.

1. INFANT Trust Home, crib, nursery, garden Birth place, setting up the home out of the crib, making a place				
the home out of the crib, making a place 2. YOUNG CHILD Autonomy children's realm, commons, connected play 3. CHILD Play space, own place, Initiative common land, neighborhood, animals 4. YOUNGSTER Children's home, school, Industry own place, adventure play, club, community 5. YOUTH Cottage, teenage society, Identity hostels, apprentice, town and region building 6. YOUNG ADULT Intimacy realm, small work group, the family, network of learning 7. ADULT Work community, generativity the family town hall, a room of one's own leach, funeral, grave sites the home out of the crib, making a place, special birthday the home out of the crib, making a place Walking, making a place Walking, making a place, special birthday First ventures in town joining First ventures in town joining First ventures in town joining Cown entrance paying your way Commencement, marriage, work, building Birth of a child, creating social wealth building The family town hall, gathering, change in work Settled work, Death, funeral, grave sites		STAGE	IMPORTANT SETTINGS	RITES OF PASSAGE
Autonomy children's realm, commons, connected play 3. CHILD Play space, own place, common land, neighborhood, animals 4. YOUNGSTER Children's home, school, own place, adventure play, club, community 5. YOUTH Cottage, teenage society, hostels, apprentice, town and region 6. YOUNG ADULT Intimacy realm, small work group, the family, network of learning 7. ADULT Work community, Generativity the family town hall, a room of one's own place, special birthday place, special birthday place, special birthday First ventures in town joining Puberty rites, private entrance paying your way Commencement, marriage, work, building Birth of a child, creating social wealth building 7. ADULT Work community, Special birthday, gathering, change in work 8. OLD PERSON Settled work, Death, funeral, grave sites	Ι.			the home out of the crib, making a
Initiative common land, neighborhood, animals 4. YOUNGSTER Children's home, school, own place, adventure play, club, community 5. YOUTH Cottage, teenage society, hostels, apprentice, town and region building 6. YOUNG ADULT Intimacy realm, small work group, the family, network of learning 7. ADULT Work community, Special birthday, a room of one's own change in work 8. OLD PERSON Settled work, Integrity cottage, the family, cottage, the family, grave sites	2.		children's realm,	0,
Industry own place, adventure play, club, community 5. YOUTH Identity Cottage, teenage society, hostels, apprentice, town and region 6. YOUNG ADULT Intimacy realm, small work group, the family, network of learning 7. ADULT Generativity Work community, Generativity Work community, Generativity Settled work, Integrity Own place, adventure private entrance paying your way Commencement, marriage, work, building Commencement, marriage, work, building Creating social wealth . building Special birthday, gathering, change in work Death, funeral, grave sites	3.		common land, neighborhood,	
Identity hostels, apprentice, town and region building 6. YOUNG ADULT Household, couple's realm, small work group, the family, network of learning 7. ADULT Work community, Generativity the family town hall, a room of one's own Change in work 8. OLD PERSON Settled work, Integrity cottage, the family, grave sites	4.		own place, adventure play, club,	private entrance
Intimacy realm, small work group, the family, network of learning 7. ADULT Work community, Special birthday, gathering, a room of one's own change in work 8. OLD PERSON Settled work, Death, funeral, Integrity cottage, the family, grave sites	5•		hostels, apprentice,	marriage, work,
Generativity the family town hall, gathering, a room of one's own change in work 8. OLD PERSON Settled work, Death, funeral, Integrity cottage, the family, grave sites	6.		realm, small work group, the family,	creating social
Integrity cottage, the family, grave sites	7.		the family town hall,	gathering,
	8.	_	cottage, the family,	, ,

Therefore:

Make certain that the full cycle of life is represented and balanced in each community. Set the ideal of a balanced life cycle as a principal guide for the evolution of communities. This means:

- That each community include a balance of people at every stage of the life cycle, from infants to the very old; and include the full slate of settings needed for all these stages of life;
- 2. That the community contain the full slate of settings which best mark the ritual crossing of life from one stage to the next.



The rites of passage are provided for, most concretely, by HOLY GROUND (66). Other specific patterns which especially support the seven ages of man and the ceremonies of transition are HOUSEHOLD MIX (35), OLD PEOPLE EVERYWHERE (40), WORK COMMUNITY (41), LOCAL TOWN HALL (44), CHILDREN IN THE CITY (57), BIRTH PLACES (65), GRAVE SITES (70), THE FAMILY (75), YOUR OWN HOME (79), MASTER AND APPRENTICES (83), TEENAGE SOCIETY (84), SHOPFRONT SCHOOLS (85), CHILDREN'S HOME (86), ROOMS TO RENT (153), TEENAGER'S COTTAGE (154), OLD AGE COTTAGE (155), SETTLED WORK (156), MARRIAGE BED (187).

27 MEN AND WOMEN



... and just as a community or neighborhood must have a proper balance of activities for people of all the different ages—community of 7000 (12), identifiable neighborhood (14), life cycle (26)—so it must also adjust itself and its activities to the balance of the sexes, and provide, in equal part, the things which reflect the masculine and feminine sides of life.

* * *

The world of a town in the 1970's is split along sexual lines. Suburbs are for women, workplaces for men; kindergartens are for women, professional schools for men; supermarkets are for women, hardware stores for men.

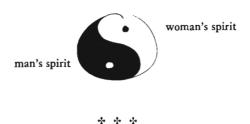
Since no aspect of life is purely masculine or purely feminine, a world in which the separation of the sexes is extreme, distorts reality, and perpetuates and solidifies the distortions. Science is dominated by a masculine, and often mechanical mentality; foreign diplomacy is governed by war, again the product of the masculine ego. Schools for young children are swayed by the world of women, as are homes. The house has become the domain of woman to such a ridiculous extreme that home builders and developers portray an image of homes which are delicate and perfectly "nice," like powder rooms. The idea that such a home could be a place where things are made or vegetables grown, with sawdust around the front door, is almost inconceivable.

The pattern or patterns which could resolve these problems are, for the moment, unknown. We can hint at the kinds of buildings and land use and institutions which would bring the problem into balance. But the geometry cannot be understood until certain social facts are realized, and given their full power to influence the environment. In short, until both men and women are able to mutually influence each part of a town's life, we shall not know what kinds of physical patterns will best co-exist with this social order.

Therefore:

TOWNS

Make certain that each piece of the environment—each building, open space, neighborhood, and work community—is made with a blend of both men's and women's instincts. Keep this balance of masculine and feminine in mind for every project at every scale, from the kitchen to the steel mill.



No large housing areas without workshops for men; no work communities which do not provide for women with part-time jobs and child care—scattered work (9). Within each place which has a balance of the masculine and feminine, make sure that individual men and women also have room to flourish, in their own right, distinct and separate from their opposites—A ROOM OF ONE'S OWN (141). . . .

both in the neighborhoods and the communities, and in between them, in the boundaries, encourage the formation of local centers:

- 28. ECCENTRIC NUCLEUS
- 29. DENSITY RINGS
- 30. ACTIVITY NODES
- 31. PROMENADE
- 32. SHOPPING STREET
- 33. NIGHT LIFE
- 34. INTERCHANGE

28 ECCENTRIC NUCLEUS*

. . . so far, we have established an overall height restriction on the city, with its attendant limitation on average density—FOUR-STORY LIMIT (21). If we assume, also, that the city contains major centers for every 300,000 people, spaced according to the rules in MAGIC OF THE CITY (10), it will then follow that the overall density of the city slopes off from these centers: the highest density near to them, the lowest far away. This means that any individual community of 7000 (12) will have an overall density, given by its distance from the nearest downtown. The question then arises: How should density vary locally, within this community; what geometric pattern should the density have? The question is complicated greatly by the principle of subcul-TURE BOUNDARY (13), which requires that communities are surrounded by their services, instead of having their services at their geometric centers. This pattern, and the next, defines a local distribution of density which is compatible with this context.



The random character of local densities confuses the identity of our communities, and also creates a chaos in the pattern of land use.

Let us begin by considering the typical configuration of the residential densities in a town. There is an overall slope to the densities: they are high toward the center and lower toward the outskirts. But there is no recognizable structure within this overall slope: no clearly visible repeating pattern we can see again and again within the city. Compare this with the contours of a mountain range. In a mountain range, there is a great deal of recognizable structure; we see systematic ridges and valleys, foothills, bowls, and peaks which have arisen naturally from geological processes; and all this structure is repeated again and again, from place to place, within the whole.

28 ECCENTRIC NUCLEUS

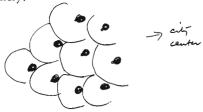
Of course, this is only an analogy. But it does raise the question: Is it natural, and all right, if density configurations in a town are so random; or would a town be better off if there was some more visible coherent structure, some kind of systematic variation in the pattern of the densities?

What happens when the local densities in a town vary in their present rambling, incoherent fashion? The high density areas, potentially capable of supporting intense activity cannot actually do so because they are too widely spread. And the low density areas, potentially capable of supporting silence and tranquility when they are concentrated, are also too diffusely scattered. The result: the town has neither very intense activity, nor very intense quiet. Since we have many arguments which show how vital it is for a town to give people both intense activity, and also deep and satisfying quiet—sacred sites (24), activity nodes (30), promenade (31), quiet backs (59), still water (71)—it seems quite likely, then, that this randomness of density does harm to urban life.

We believe, indeed, that a town would be far better off if it did contain a coherent pattern of densities. We present a systematic account of the factors which might naturally influence the pattern of density—in the hope of showing what kind of coherent pattern might be sensible and useful. The argument has five steps.

- I. We may assume, reasonably, that some kind of center, formed by local services, will occur at least once in every community of 7000. This center will typically be the kind we have called a SHOPPING STREET (32). In WEB OF SHOPPING (19) we have shown that shopping streets occur about once for every 10,000 persons.
- 2. From the arguments presented in SUBCULTURE BOUNDARY (13), we know that this center of activity, since it is a service, should occur in the boundary between subcultures, should help to form the boundary between subcultures, and should therefore be located in the area of the boundary—not *inside* the community, but between communities.
- 3. We know, also, that this center must be in just that part of the boundary which is closest to the center of the larger town or city. This follows from a dramatic and little known series of results which show that catch basins of shopping centers are not

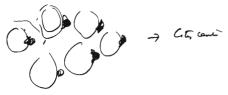
circles, as one might naïvely suppose, but half-circles, with the half-circle on that side of the center away from the central city, because people always go to that shopping center which lies toward the center of their city, never to the one which lies toward the city's periphery.



Brennan's catch basins.

This phenomenon was originally discovered by Brennan in his post-war studies of Wolverhampton (T. Brennan, Midland City, London: Dobson, 1948). It has, since then, been confirmed and studied by several writers, most notably Terence Lee, "Perceived Distance as a Function of Direction in the City," Environment and Behavior, June 1970, 40-51. Lee has shown that the phenomenon is not only caused by the fact that people are simply more familiar with the roads and paths that lie toward the center, and use them more often, but that their very perception of distance varies with direction, and that distances along lines toward the center are seen as much shorter than distances along lines away from the center.

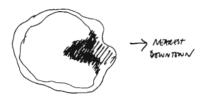
Since we certainly want the community to correspond with the catch basin of its "center" it is essential, then, that the center be placed off-center—in fact, at that point in the community which lies toward the center of the larger city. This is, of course, compatible with the notion discussed already, that the center should lie in the boundary of the community.



Eccentric centers.

28 ECCENTRIC NUCLEUS

4. Even though the center lies on one side of the community, forming a boundary of the community, we may also assume that the center does need to bulge into the community just a little. This follows from the fact that, even though services do need to be in the boundary of the community, not in its middle, still, people do have some need for the psychological center of their community to be at least somewhere toward the geometric center of gravity. If we make the boundary bulge toward the geometric center, then this axis will naturally form a center—and, further, its catch basin, according to the data given above, will correspond almost perfectly with the community.



The inward bulge.

5. Finally, although we know that the center needs to be mainly in the boundary, we do not know exactly just how large it needs to be. At the edge of the city, where the overall density is low—the center will be small. At the center of the city, where the overall density is higher, it will be larger, because the greater density of population supports more services. In both cases, it will be in the boundary. If it is too large to be contained at one point, it will naturally extend itself along the boundary, but still within the boundary, thus forming a lune, a partial horseshoe, long or short, according to its position in the greater city.



A partial horseshoe.

TOWNS

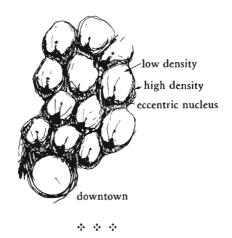
These rules are rather simple. If we follow them, we shall find a beautiful gradient of overlapping imbricated horseshoes, not unlike the scales of a fish. If the city gradually gets this highly coherent structure, then we can be sure that the articulation of dense areas, and areas of little density, will be so clear that both activity and quiet can exist, each intense, unmixed, and each available to everyone.

Therefore:

Encourage growth and the accumulation of density to form a clear configuration of peaks and valleys according to the following rules:

- Consider the town as a collection of communities of 7000. These communities will be between ¹/₄ mile across and 2 miles across, according to their overall density.
- 2. Mark that point in the boundary of each community which is closest to the nearest major urban center. This point will be the peak of the density, and the core of the "eccentric" nucleus.
- 3. Allow the high density to bulge in from the boundary, toward the center of gravity of the community, thus enlarging the eccentric nucleus toward the center.
- 4. Continue this high density to form a ridge around the boundary in horseshoe fashion—with the length of the horseshoe dependent on the overall mean gross density, at that part of the city, and the bulge of the horseshoe toward the center of the region, so that the horseshoes form a gradient, according to their position in the region. Those close to a major downtown are almost complete; those further away are only half complete; and those furthest from centers are shrunken to a point.

28 ECCENTRIC NUCLEUS



Given this overall configuration, now calculate the average densities at different distances from this ridge of high density, according to the computations given in the next pattern—density rings (29); keep major shopping streets and promenades toward the dense part of the horseshoe—activity nodes (30), promenade (31), shopping street (32); and keep quiet areas toward the open part of the horseshoe—sacred sites (24), quiet backs (59), still water (71)...

29 DENSITY RINGS*

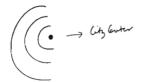
. . . in ECCENTRIC NUCLEUS (28) we have given a general form for the configuration of density "peaks" and "valleys," with respect to the mosaic of subcultures (8) and subculture BOUNDARIES (13). Suppose now that the center of commercial activity in a community of 7000 (12) is placed according to the prescriptions of ECCENTRIC NUCLEUS (28), and according to the overall density within the region. We then face the problem of establishing local densities, for house clusters and work communities, at different distances around this peak. This pattern gives a rule for working out the gradient of these local densities. Most concretely, this gradient of density can be specified, by drawing rings at different distances from the main center of activity and then assigning different densities to each ring, so that the densities in the succeeding rings create the gradient of density. The gradient will vary from community to community both according to a community's position in the region, and according to the cultural background of the people.



People want to be close to shops and services, for excitement and convenience. And they want to be away from services, for quiet and green. The exact balance of these two desires varies from person to person, but in the aggregate it is the balance of these two desires which determines the gradient of housing densities in a neighborhood.

In order to be precise about the gradient of housing densities, let us agree at once, to analyze the densities by means of three concentric semi-circular rings, of equal radial thickness, around the main center of activity.

[We make them semi-circles, rather than full circles, since it has been shown, empirically, that the catch basin of a given local



Rings of equal thickness.

center is a half-circle, on the side away from the city—see discussion in ECCENTRIC NUCLEUS (28) and the references to Brennan and Lee given in that pattern. However, even if you do not accept this finding, and wish to assume that the circles are full circles, the following analysis remains essentially unchanged.] We now define a density gradient, as a set of three densities, one for each of the three rings.



A density gradient.

Imagine that the three rings of some actual neighborhood have densities D₁, D₂, D₃. And assume, now, that a new person moves into this neighborhood. As we have said, within the given density gradient, he will choose to live in that ring, where his liking for green and quiet just balances his liking for access to shops and public services. This means that each person is essentially faced with a choice among three alternative density-distance combinations:

Ring 1. The density D_1 , with a distance of about R_1 to shops.

Ring 2. The density D_2 , with a distance of about R_2 to shops.

Ring 3. The density D_3 , with a distance of about R_3 to shops.

Now, of course, each person will make a different choice—according to his own personal preference for the balance of density and distance. Let us imagine, just for the sake of argument, that all the people in the neighborhood are asked to make this choice (forgetting, for a moment, which houses are available). Some will

choose ring 1, some ring 2, and some ring 3. Suppose that N_1 choose ring 1, N_2 choose ring 2, and N_3 choose ring 3. Since the three rings have specific, well-defined areas, the numbers of people who have chosen the three areas, can be turned into hypothetical densities. In other words, if we (in imagination) distribute the people among the three rings according to their choices, we can work out the hypothetical densities which would occur in the three rings as a result.

Now we are suddenly faced with two fascinating possibilities:

I. These new densities are different from the actual densities.

II. These new densities are the same as the actual densities.

Case I is much more likely to occur. But this is unstable—since people's choices will tend to change the densities. Case II, which is less likely to occur, is stable—since it means that people, choosing freely, will together re-create the very same pattern of density within which they have made these choices. This distinction is fundamental.

If we assume that a given neighborhood, with a given total area, must accommodate a certain number of people (given by the average density of people at that point in the region), then there is just *one* configuration of densities which is stable in this sense. We now describe a computational procedure which can be used to obtain this stable density configuration.

Before we explain the computational procedure, we must explain how very fundamental and important this kind of stable density configuration is.

In today's world, where density gradients are usually not stable, in our sense, most people are forced to live under conditions where the balance of quiet and activity does not correspond to their wishes or their needs, because the total number of available houses and apartments at different distances is inappropriate. What happens, then, is that the rich, who can afford to pay for what they want, are able to find houses and apartments with the balance that they want; the not so rich and poor are forced to take the leavings. All this is made legitimate by the middle-class economics of "ground rent"—the idea that land at different distances from centers of activity, commands different prices, because more or less people want to be at those distances. But actually the fact of differential ground rent is an economic

29 DENSITY RINGS

mechanism which springs up, within an unstable density configuration, to compensate for its instability.

We want to point out that in a neighborhood with a stable density configuration (stable in our sense of the word), the land would not need to cost different prices at different distances, because the total available number of houses in each ring would exactly correspond to the number of people who wanted to live at those distances. With demand equal to supply in every ring, the ground rents, or the price of land, could be the same in every ring, and everyone, rich and poor, could be certain of having the balance they require.

We now come to the problem of computing the stable densities for a given neighborhood. The stability depends on very subtle psychological forces; so far as we know these forces cannot be represented in any psychologically accurate way by mathematical equations, and it is therefore, at least for the moment, impossible to give a mathematical model for the stable density. Instead, we have chosen to use the fact that each person can make choices about his required balance of activity and quiet, and to use people's choices, within a simple game, as the source of the computation. In short, we have constructed a game, which allows one to obtain the stable density configuration within a few minutes. This game essentially simulates the behavior of the real system, and is, we believe, far more reliable than any mathematical computation.

DENSITY GRADIENTS GAME

- 1. First draw a map of the three concentric half rings. Make it a half-circle—if you accept the arguments of ECCENTRIC NUCLEUS (28)—otherwise a full circle Smooth this half-circle to fit the horseshoe of the highest density—mark its center as the center of that horseshoe.
- 2. If the overall radius of the half-circle is R, then the mean radii of the three rings are R_1,R_2,R_3 given by:

$$R_1 = R/6$$

 $R_2 = _3R/6$
 $R_3 = _5R/6$

- 3. Make up a board for the game, which has the three concentric circles shown on it, with the radii marked in blocks, so people can understand them easily, i.e., 1000 feet = 3 blocks.
 - 4. Decide on the total population of this neighborhood. This is

the same as settling on an overall average net density for the area. It will have to be roughly compatible with the overall pattern of density in the region. Let us say that the total population of the community is N families.

5. Find ten people who are roughly similar to the people in the community—vis-à-vis cultural habits, background, and so on. If possible, they should be ten of the people in the actual community itself.

6. Show the players a set of photographs of areas that show typical best examples of different population densities (in families per gross acre), and leave these photographs on display throughout the game so that people can use them when they make their choices.

7. Give each player a disk, which he can place on the board in one of the three rings.

8. Now, to start the game, decide what percentage of the total population is to be in each of the three rings. It doesn't matter what percentages you choose to start with—they will soon right themselves as the game gets under way—but, for the sake of simplicity, choose multiples of 10 per cent for each ring, i.e., 10 per cent in ring 1, 30 per cent in ring 2, 60 per cent in ring 3.

9. Now translate these percentages into actual densities of families per net acre. Since you will have to do this many times during the course of the game, it is advisable to construct a table which translates percentages directly into densities. You can make up such a table by inserting the values for N and R which you have chosen for your community into the formulae below. The formulae are based on the simple arithmetic of area, and population. R is expressed in hundreds of yards—roughly in blocks. The densities are expressed in families per gross acre. Multiply each ring density by a number between 1 and 10, according to the per cent in that ring. Thus, if there are 30 per cent in ring 3, the density there is 3 times the entry in the formulae, or $24N/4\pi R^2$.

10%

Ring I $8N/\pi R^2$ Ring 2 $8N/3\pi R^2$ Ring 3 $8N/5\pi R^2$

ro. Once you have found the proper densities, from the formulae, write them on three slips of paper, and place these slips into their appropriate rings, on the game board.

TI. The slips define a tentative density configuration for the community. Each ring has a certain typical distance from the center. And each ring has a density. Ask people to look carefully at the pictures which represent these densities, and then to decide which of the three rings gives them the best balance of quiet and green, as against access to shops. Ask each person to place his disk in the ring he chooses.

29 DENSITY RINGS

12. When all ten disks are on the board, this defines a new distribution of population. Probably, it is different from the one you started with. Now make up a new set of percentages, half-way between the one you originally defined, and the one which people's disks define, and, again, round off the percentages to the nearest 10 per cent. Here is an example of the way you can get new percentages.

Old percentages	People's disks		New percentages
10%	3 = 30%	\longrightarrow	20%
30%	4 = 40%	\longrightarrow	30%
60%	3 = 30%	\longrightarrow	50%

As you see, the new ones are not perfectly half-way between the other two—but as near as you can get, and still have multiples of ten.

13. Now go back to step 9, and go through 9, 10, 11, 12 again and again, until the percentages defined by people's disks are the same as the ones you defined for that round. If you turn these last stable percentages into densities, you have found the stable density configuration for this community. Stop, and have a drink all round.

In our experiments, we have found that this game reaches a stable state very quickly indeed. Ten people, in a few minutes, can define a stable density distribution. We have presented the results of one set of games in the table which follows below.

STABLE DENSITY DISTRIBUTIONS FOR DIFFERENT SIZED COMMUNITIES

These figures are for semi-circular communities.

		Density in families per gross acre			
Radius in blocks	Population in families	Ring 1	Ring 2	Ring 3	
2	150	15	9	5	
3	150	7	5	2	
3	300	2 I	7	5	
4	300	7	3	2	
4	600	29	7	4	
6	600	15	4	2	
6	I 200	36	9	3	
9	1200	18	5	I	

It is essential to recognize that the densities given in this table cannot wisely be used just as they stand. The figures will vary with the exact geometry of the neighborhood and with different cultural attitudes in different subcultures. For this reason, we consider it essential that the people of a given community, who want to apply this pattern, play the game themselves, in order to find a stable gradient of densities for their own situation. The numbers we have given above are more for the sake of illustration than anything else.

Therefore:

Once the nucleus of a community is clearly placed—define rings of decreasing local housing density around this nucleus. If you cannot avoid it, choose the densities from the foregoing table. But, much better, if you can possibly manage it, play the density rings game, to obtain these densities, from the intuitions of the very people who are going to live in the community.



Within the rings of density, encourage housing to take the form of housing clusters—self-governing cooperatives of 8 to 15 households, their physical size varying according to the density—HOUSE CLUSTER (37). According to the densities in the different rings, build these houses as free-standing houses—HOUSE CLUSTER (37), ROW HOUSES (38), or higher density clusters of housing—HOUSING HILL (39). Keep public spaces—PROMENADE (31), SMALL PUBLIC SQUARES (61)—to those areas which have a high enough density around them to keep them alive—PEDESTRIAN DENSITY (123). . . .

30 ACTIVITY NODES**



. . . this pattern forms those essential nodes of life which help to generate identifiable neighborhood (14), promenade (31), network of paths and cars (52), and pedestrian street (100). To understand its action, imagine that a community and its boundary are growing under the influence of community of 7000 (12), subculture boundary (13), identifiable neighborhood (14), neighborhood boundary (15), eccentric nucleus (28), and density rings (29). As they grow, certain "stars" begin to form, where the most important paths meet. These stars are potentially the vital spots of a community. The growth of these stars and of the paths which form them need to be guided to form genuine community crossroads.



Community facilities scattered individually through the city do nothing for the life of the city.

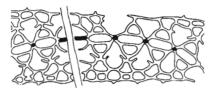
One of the greatest problems in existing communities is the fact that the available public life in them is spread so thin that it has no impact on the community. It is not in any real sense available to the members of the community. Studies of pedestrian behavior make it clear that people seek out concentrations of other people, whenever they are available (for instance, 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 squares which can function as nodes—with all pedestrian movement in the community organized to pass through these nodes. Such nodes require four properties.

First, each node must draw together the main paths in the surrounding community. The major pedestrian paths should converge on the square, with minor paths funneling into the major ones, to create the basic star-shape of the pattern. This is much harder to do than one might imagine. To give an example of the difficulty which arises when we try to build this relationship into a town, we show the following plan—a scheme of

30 ACTIVITY NODES

ours for housing in Peru—in which the paths are all convergent on a very small number of squares.



Public paths converge on centers of action.

This is not a very good plan—it is too stiff and formal. But it is possible to achieve the same relationship in a far more relaxed manner. In any case the relationship between paths, community facilities, and squares is vital and hard to achieve. It must be taken seriously, from the very outset, as a major feature of the city.

Second, to keep the activity concentrated, it is essential to make the squares rather small, smaller than one might imagine. A square of about 45 × 60 feet can keep the normal pace of public life well concentrated. This figure is discussed in detail under SMALL PUBLIC SQUARE (61).

Third, the facilities grouped around any one node must be chosen for their symbiotic relationships. It is 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 node must function in a cooperative manner, and must attract the same kinds of people, at the same times of day. For example, when evening entertainments are grouped together, the people who are having a night out can use any one of them, and the total concentration of action increases—see NIGHT LIFE (33). When kindergartens and small parks and gardens are grouped together, young families with children may use either, so their total attraction is increased.

Fourth, these activity nodes should be distributed rather evenly

TOWNS

across the community, so that no house or workplace is more than a few hundred yards from one. In this way a contrast of "busy and quiet" can be achieved at a small scale—and large dead areas can be avoided.

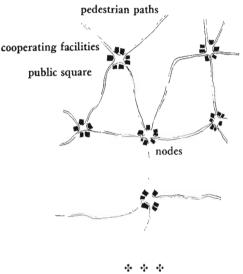


Nodes of different size.

Therefore:

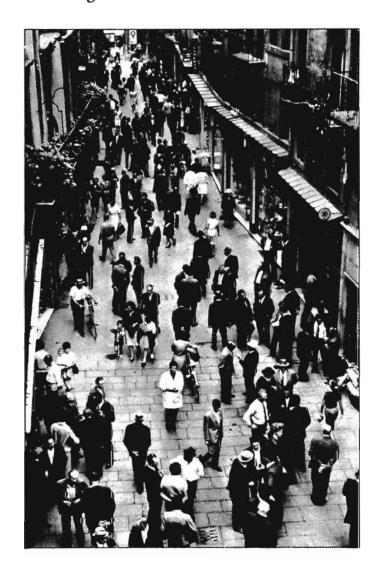
Create nodes of activity throughout the community, spread about 300 yards apart. First identify those existing spots in the community where action seems to concentrate itself. Then modify the layout of the paths in the community to bring as many of them through these spots as possible. This makes each spot function as a "node" in the

path network. Then, at the center of each node, make a small public square, and surround it with a combination of community facilities and shops which are mutually supportive.



Connect those centers which are most dense, with a wider, more important path for strolling—PROMENADE (31); make special centers for night activities—NIGHT LIFE (33); whenever new paths are built, make certain that they pass through the centers, so that they intensify the life still further—PATHS AND GOALS (120); and differentiate the paths so they are wide near the centers and smaller away from them—DEGREES OF PUBLICNESS (36). At the heart of every center, build a small public square—SMALL PUBLIC SQUARES (61), and surround each square with an appropriate mix of mutually self-reinforcing facilities—work community (41), university as a marketplace (43), local town hall (44), health center (47), birth places (65), teenage society (84), shopfront school (85), individually owned shops (87), street cafe (88), beer hall (90), food stands (93). . . .

3 I PROMENADE**



... assume now that there is an urban area, subdivided into subcultures and communities each with its boundaries. Each subculture in the Mosaic of Subcultures (8), and each community of 7000 (12) has a promenade as its backbone. And each promenade helps to form activity nodes (30) along its length, by generating the flow of people which the activity nodes need in order to survive.

* * *

Each subculture needs a center for its public life: a place where you can go to see people, and to be seen.

The promenade, "paseo," "passegiata," evening stroll, is common in the small towns of Italy, Spain, Mexico, Greece, Yugoslavia, Sicily, and South America. People go there to walk up and down, to meet their friends, to stare at strangers, and to let strangers stare at them.

Throughout history there have been places in the city where people who shared a set of values could go to get in touch with each other. These places have always been like street theaters: they invite people to watch others, to stroll and browse, and to loiter:

In Mexico, in any small town plaza every Thursday and Sunday night with the band playing and the weather mild, the boys walk this way, the girls walk that, around and around, and the mothers and fathers sit on iron-scrolled benches and watch. (Ray Bradbury, "The girls walk this way; the boys walk that way . . ." West, Los Angeles Times Sunday Magazine, April 5, 1970.)

In all these places the beauty of the promenade is simply this: people with a shared way of life gather together to rub shoulders and confirm their community.

Is the promenade in fact a purely Latin institution? Our experiments suggest that it is not. The fact is that the kinds of promenades where this strolling happens are not common in a city, and they are especially uncommon in a sprawling urban region. But experiments by Luis Racionero at the Department of

Architecture at the University of California, Berkeley, have shown that wherever the possibility of this public contact does exist, people will seek it, as long as it is close enough. Racionero interviewed 37 people in several parts of San Francisco, living various distances from a promenade, and found that people who lived within 20 minutes used it, while people who lived more than 20 minutes away did not.

	Use the promenade	Do not use the promenade
People who live less		
than 20 minutes away	13	ĭ
People who live more		
than 20 minutes away	5	18

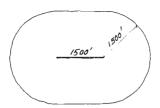
It seems that people, of all cultures, may have a general need for the kind of human mixing which the promenade makes possible; but that if it is too far, the effort to get there simply outweighs the importance of the need. In short, to make sure that all the people in a city can satisfy this need, there must be promenades at frequent intervals.

Exactly how frequent should they be? Racionero establishes 20 minutes as the upper limit, but his survey does not investigate frequency of use. We know that the closer the promenade is, the more often people will use it. We guess that if the promenade is within 10 minutes or less, people will use it often—perhaps even once or twice a week.

The relation between the catch basin of the promenade, and the actual physical paved area of the promenade itself, is extremely critical. We show in PEDESTRIAN DENSITY (123), that places with less than one person for every 150 to 300 square feet of paved surface, will seem dead and uninviting. It is therefore essential to be certain that the number of people who might, typically, be out strolling on the promenade, is large enough to maintain this pedestrian density along its length. To check this relation, we calculate as follows:

A 10-minute walk amounts to roughly 1500 feet (150 feet per minute), which is probably also about the right length for the promenade itself. This means that the catch basin for a promenade has a shape roughly like this:

?I PROMENADE



A promenade and its catch basin.

This area contains 320 acres. If we assume an average density of 50 people per gross acre, then there are 16,000 people in the area. If one-fifth of this population uses the promenade once a week, for an hour between 6 and 10 p.m., then at any given moment between those hours, there are some 100 people on the promenade. If it is 1500 feet long, at 300 square feet per person, it can therefore be 20 feet wide, at the most, and would be better if it were closer to 10 feet wide. It is feasible, but only just.

We see then, that a promenade 1500 feet long, with the catch basin we have defined and the population density stated, should be able to maintain a lively density of activity, provided that it is not more than about 20 feet wide. We want to emphasize that a promenade will not work unless the pedestrian density is high enough, and that a calculation of this kind must always be made to check its feasibility.

The preceding figures are meant to be illustrative. They establish a rough order of magnitude for promenades and their catch basin populations. But we have also seen successful promenades for populations of 2000 (a fishing village in Peru); and we have seen a promenade for 2,000,000 (Las Ramblas in Barcelona). They both work, although they are very different in character. The small one with its catch basin of 2000 works, because the cultural habit of the paseo is so strong there, a higher percentage of the people use it more often, and the density of people on the promenade is less than we would imagine—it is so beautiful that people enjoy it even if it is not so crowded. The large one works as a citywide event. People are willing to drive a long distance to it—they may not come as often, but when they do, it is worth the ride—it is exciting—packed—teeming with people.

We imagine the pattern of promenades in a city to be just as varied—a continuum ranging from small local promenades serv-

ing 2000 people to large intense ones serving the entire city—each different in character and density of action.

Finally, what are the characteristics of a successful promenade? Since people come to see people and to be seen, a promenade must have a high density of pedestrians using it. It must therefore be associated with places that in themselves attract people, for example, clusters of eating places and small shops.



A promenade in Paris.

Further, even though the real reasons for coming might have to do with seeing people and being seen, people find it easier to take a walk if they have a "destination." This destination may be real, like a coke shop or cafe, or it may be partly imaginary, "let's walk round the block." But the promenade must provide people with a strong goal.

It is also important that people do not have to walk too far between the most important points along the promenade. Informal observation suggests that any point which is more than 150 feet from activity becomes unsavory and unused. In short, good promenades are part of a path through the most active parts of the community; they are suitable as destinations for an evening walk; the walk is not too long, and nowhere on it desolate: no point of the stroll is more than 150 feet from a hub of activity.

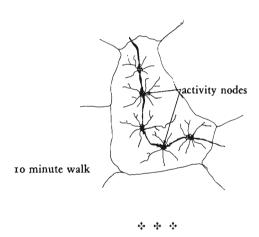
A variety of facilities will function as destinations along the promenade: ice cream parlors, coke shops, churches, public gardens, movie houses, bars, volleyball courts. Their potential will depend on the extent to which it is possible to make provisions for people to stay: widening of pedestrian paths, planting of trees, walls to lean against, stairs and benches and niches for sitting,

31 PROMENADE

opening of street fronts to provide sidewalk cafes, or displays of activities or goods where people might like to linger.

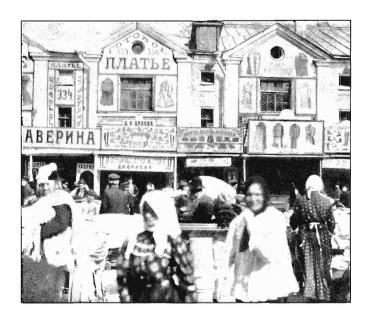
Therefore:

Encourage the gradual formation of a promenade at the heart of every community, linking the main activity nodes, and placed centrally, so that each point in the community is within 10 minutes' walk of it. Put main points of attraction at the two ends, to keep a constant movement up and down.



No matter how large the promenade is, there must be enough people coming to it to make it dense with action, and this can be precisely calculated by the formula of PEDESTRIAN DENSITY (123). The promenade is mainly marked by concentrations of activity along its length—ACTIVITY NODES (30); naturally, some of these will be open at night—NIGHT LIFE (33); and somewhere on the promenade there will be a concentration of shops—shopping street (32). It might also be appropriate to include CARNIVAL (58) and DANCING IN THE STREET (63) in very large promenades. The detailed physical character of the promenade is given by PEDESTRIAN STREET (100) and PATH SHAPE (121). . . .

32 SHOPPING STREET*



. . . this pattern helps to complete the MAGIC OF THE CITY (10) and PROMENADE (31). And, each time a shopping street gets built, it will also help to generate the WEB OF SHOPPING (19).



Shopping centers depend on access: they need locations near major traffic arteries. However, the shoppers themselves don't benefit from traffic: they need quiet, comfort, and convenience, and access from the pedestrian paths in the surrounding area.

This simple and obvious conflict has almost never been effectively resolved. On the one hand, we have shopping strips. Here the shops are arranged along the major traffic arteries. This is convenient for cars, but it is not convenient for pedestrians. A strip does not have the characteristics which pedestrian areas need.



Shopping strip—for cars.

On the other hand, we have those "pre-automobile" shopping streets in the center of old towns. Here the pedestrians' needs are taken into account, at least partially. But, as the town spreads out and the streets become congested, they are inconvenient to reach; and again the cars dominate the narrow streets.

The modern solution is the shopping center. They are usually located along, or near to, major traffic arteries, so they

TOWNS



Old shopping street—inconvenient for cars and people.

are convenient for cars; and they often have pedestrian precincts in them—so that, in theory at least, they are comfortable and convenient for pedestrians. But they are usually isolated, in the middle of a vast parking lot, and thereby disconnected from the pedestrian fabric of the surrounding areas. In short, you cannot walk to them.



New shopping center—only for cars.

To be convenient for traffic, and convenient for people walking, and connected to the fabric of the surrounding town, the shops must be arranged along a street, itself pedestrian, but opening off a major traffic artery, perhaps two, with parking behind, or underneath, to keep the cars from isolating the shops from surrounding areas.

We observed this pattern growing spontaneously in certain neighborhoods of Lima, Peru: a wide road is set down for automobile traffic, and the shops begin to form themselves, in pedestrian streets that are perpendicular off-shoots off this road.



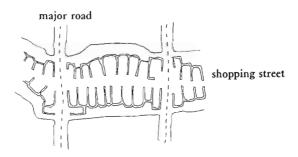


Shopping streets growing spontaneously in Lima, Peru.

This pattern is also the form of the famous Stroget in Copenhagen. The Stroget is the central shopping spine for the city; it is extremely long—almost a mile—and is entirely pedestrian, only cut periodically by roads which run at right angles to it.

Therefore:

Encourage local shopping centers to grow in the form of short pedestrian streets, at right angles to major roads and opening off these roads—with parking behind the shops, so that the cars can pull directly off the road, and yet not harm the shopping street.





Treat the physical character of the street like any other PEDESTRIAN STREET (100) on the NETWORK OF PATHS AND CARS (52), at right angles to major PARALLEL ROADS (23); have as many shops as small as possible—INDIVIDUALLY OWNED SHOPS (87); where the shopping street crosses the road, make the crossing wide, giving priority to the pedestrians— ROAD CROSSING (54); parking can easily be provided by a single row of parking spaces in an alley lying behind the shops—all along the backs of the shops, off the alley, with the parking spaces walled, and perhaps even given canvas roofs, so that they don't destroy the area—shielded Parking (97), Canvas Roofs (244). Make sure that every shopping street includes a MARKET OF MANY SHOPS (46), and some HOUSING IN BETWEEN (48). . . .

33 NIGHT LIFE*



... every community has some kind of public night life—MAGIC OF THE CITY (10), COMMUNITY OF 7000 (12). If there is a promenade in the community, the night life is probably along the promenade, at least in part—PROMENADE (31). This pattern describes the details of the concentration of night time activities.



Most of the city's activities close down at night; those which stay open won't do much for the night life of the city unless they are together.

This pattern is drawn from the following seven points:

- 1. People enjoy going out at night; a night on the town is something special.
- 2. If evening activities such as movies, cases, ice cream parlors, gas stations, and bars are scattered throughout the community, each one by itself cannot generate enough attraction.



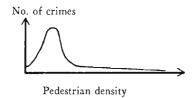
One bar by itself is a lonely place at night.

- 3. Many people do not go out at night because they feel they have no place to go. They do not feel like going out to a specific establishment, but they do feel like going out. An evening center, particularly when it is full of light, functions as a focus for such people.
- 4. Fear of the dark, especially in those places far away from one's own back yard, is a common experience, and quite simple to understand. Throughout our evolution night has been a time to stay quiet and protected, not a time to move about freely.



A cluster of night spots creates life in the street.

5. Nowadays this instinct is anchored in the fact that at night street crimes are most prevalent in places where there are too few pedestrians to provide natural surveillance, but enough pedestrians to make it worth a thief's while, in other words, dark, isolated night spots invite crime. A paper by Shlomo Angel, "The Ecology of Night Life" (Center for Environmental Structure, Berkeley, 1968), shows the highest number of street crimes occurring in those areas where night spots are scattered. Areas of very low or very high night pedestrian density are subject to much less crime.



Isolated night spots invite crime.

- 6. It is difficult to estimate the exact number of night spots that need to be grouped to create a sense of night life. From observation, we guess that it takes about six, minimum.
- 7. On the other hand, massive evening centers, combining evening services which a person could not possibly use on the same night, are alienating. For example, in New York the Lincoln Center for the Performing Arts makes a big splash at night, but it makes no sense. No one is going to the ballet and the theater and a concert during one night on the town. And centralizing these places robs the city as a whole of several centers of night life.

TOWNS

All these arguments together suggest small, scattered centers of mutually enlivening night spots, the services grouped to form cheery squares, with lights and places to loiter, where people can spend several hours in an interesting way. Here are some examples of small groups of mutually sustaining night activities.

A movie theater, a restaurant and a bar, and a bookstore open till midnight; a smoke shop.

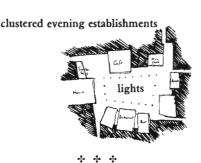
A laundromat, liquor store and cafe; and a meeting hall and beer hall.

Lodge hall, bowling alley, bar, playhouse.

A terminal, a diner, hotels, nightclubs, casinos.

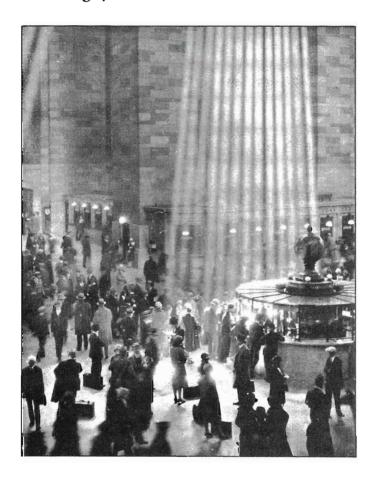
Therefore:

Knit together shops, amusements, and services which are open at night, along with hotels, bars, and all-night diners to form centers of night life: well-lit, safe, and lively places that increase the intensity of pedestrian activity at night by drawing all the people who are out at night to the same few spots in the town. Encourage these evening centers to distribute themselves evenly across the town.



Treat the physical layout of the night life area exactly like any other activity node (30), except that all of its establishments are open at night. The evening establishments might include LOCAL TOWN HALL (44), CARNIVAL (58), DANCING IN THE STREET (63), STREET CAFE (88), BEER HALL (90), TRAVELER'S INN (91). . . .

34 INTERCHANGE



. . . this pattern defines the points which generate the WEB OF PUBLIC TRANSPORTATION (16). It also helps to complete LOCAL TRANSPORT AREAS (11) by guaranteeing the possibility of interchanges at the center of each transport area, where people can change from their bikes, or local mini-buses, to the long distance transit lines that connect different transport areas to one another.



Interchanges play a central role in public transportation. Unless the interchanges are working properly, the public transportation system will not be able to sustain itself.

Everyone needs public transportation sometimes. But it is the steady users who keep it going. If the steady users do not keep it going, then there is no system for the occasional user. To maintain a steady flow of users, interchanges must be extremely convenient and easy to use: I. Workplaces and the housing for people who especially need public transportation must be distributed rather evenly around interchanges. 2. The interchanges must connect up with the surrounding flow of pedestrian street life. 3. It must be easy to change from one mode of travel to another.

In more detail:

I. Workers are the bread and butter of the transportation system. If the system is to be healthy, all the workplaces in town must be within walking distance of the interchanges. Furthermore, the distribution of workplaces around interchanges should be more or less even—see SCATTERED WORK (9). When they are concentrated around one or two, the rush hour flow crowds the trains, and creates inefficiencies in the system as a whole.

Furthermore, some of the area around interchanges should be given over to houses for those people who rely entirely on public transportation—especially old people. Old people depend on public transportation; they make up a large proportion of the system's regular users. To meet their needs, the area around interchanges must be zoned so that the kind of housing that suits them will develop there—old people everywhere (40).

34 INTERCHANGE

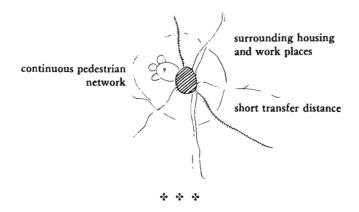
- 2. The interchange must be convenient for people walking from their homes and jobs, and it must be safe. People will not use an interchange if it is dingy, derelict, and deserted. This means that the interchange must be continuous with local pedestrian life. Parking lots must be kept to one side, so that people do not have to walk across them to get to the station. And there must be enough shops and kiosks in the interchange, to keep a steady flow of people moving in and out of it and through it.
- 3. If the system is going to be successful, there must be no more than a few minutes' walk—600 feet at the most—between points of transfer. And the distance should decrease as the trips become more local: from bus to bus, 100 feet maximum; from rapid transit to bus, 200 feet maximum; from train to rapid transit, 300 feet maximum. In rainy climates the connecting paths should be almost entirely covered—ARCADES (119). What's more, the most important transfer connections should not involve crossing streets: if necessary sink the roads or build bridges to make the transfer smooth.

For details on the organization of interchanges, see "390 Requirements for Rapid Transit Stations," Center for Environmental Structure, 1964, partly published in "Relational Complexes in Architecture" (Christopher Alexander, Van Maren King, Sara Ishikawa, Michael Baker, Architectural Record, September 1966, pp. 185-90).

Therefore:

At every interchange in the web of transportation follow these principles:

- 1. Surround the interchange with workplaces and housing types which specially need public transportation.
- Keep the interior of the interchange continuous with the exterior pedestrian network, and maintain this continuity by building in small shops and kiosks and by keeping parking to one side.
- 3. Keep the transfer distance between different modes of transport down to 300 feet wherever possible, with an absolute maximum of 600 feet.



Recognize that the creation of workplaces around every interchange contributes to the development of SCATTERED WORK (9). Place HOUSING HILLS (39), OLD PEOPLE EVERYWHERE (40), and WORK COMMUNITIES (41) round the interchange; treat the outside of the interchange as an ACTIVITY NODE (30) to assure its continuity with the pedestrian network; treat the transfers as ARCADES (119) where necessary to keep them under cover; give every interchange a BUS STOP (92) on the MINI-BUS (20) network. . . .