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SELF-SUPPORTING URBAN STRUCTURE
A DIVERSIFIED-INTEGRATED MODEL

BY

LENARD BUDIWSKI

A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
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FOR

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SELF-SUPPORTING URBAN STRUCTURE
A DIVERSIFIED-INTEGRATED MODEL

BY

LENARD BUDIWSKI

A thesis submitted to the Faculty of Graduate Studies of
the University of Manitoba in partial fulfillment of the requirements
of the degree of

MASTER OF CITY PLANNING

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DEFINITIONS

Self-Supporting:

The key concept which indicates the contemporary need for non-reliance on the external community for life-sustaining resources. As used in the thesis the term is relative - that is, within the parameters chosen for the prototypical urban structure a higher degree of self-support is projected: living spaces, work places, food growing/processing areas and on-site energy sources are combined to reduce dependence on arbitrary and undependable external sources.

Structures:

The term refers to the physical structure of the prototype that is the realization of community needs--social, economic and political. The author's basic premise is that the social structure should be more egalitarian and economically communal, the physical structure will reflect these principles. (See Chapter four - prototype design.)

Diversified:

The multiformity of urban life does not lend itself to existence in single-purpose environments. It thrives in highly variegated expressions of uses and activities that are ecologically unified.

Integrated:

Urban fabric is adversely affected by haphazardly combining unrelated and incompatible elements. Diversified elements 'glued together' within a highly integrated matrix give form and substance to the city. Integration implies a reliance of one element upon another rather than one element in opposition to or in competition with another, or indifferent to each other's presence.

INTRODUCTION

THESIS ABSTRACT

The major intent of this thesis is to present an alternative to the current outmoded and wasteful ways in which cities are being developed. The status quo of urban development is challenged and replaced with a self-supporting urban structure that is highly integrated and diversified. The elements of urban malaise identified in chapter one are dealt with in chapter four after a discussion of historic precedents and contemporary solutions illustrating the principles contributing to the author's prototype proposal. The prototype is an urban design solution that is firmly rooted in the author's major premise that social change is as important as urban design in the altering of urban patterns.

PROLOGUE - THESIS RELEVANCY

The rapid depletion of fossil fuel energy sources and other non-renewable natural resources poses a threat to our very existence. Many changes are required while choices still exist:

1. Shifting emphasis from private automobile use to public transit that utilizes renewable energy sources.
2. Altering the pattern of urban development by de-emphasizing expansion or concentrating on an intensification of central areas.
3. Altering economic, political, and social institutions to facilitate the changes required.

It is the author's major premise that this need for change can be achieved in a period between the present and the year 2000 by the reassessment and redeployment of energy and natural resources in a much more 'resourceful' manner in a political, economic, and social structure that is largely self-sufficient. By calculating the resources that we are able to obtain and by using them effectively, we will be able to sustain a good urban life--one that will not be fettered by fears of scarcity.

It is the precarious nature of our economy and the worsening condition of our cities that lend the greatest relevancy to this thesis. The major contribution made by the thesis is that it presents an alternative achievable within the resources and technology we possess in Canada at present. No major discoveries are necessary. The author presents the prototype to increase awareness of alternatives and to stimulate discussion and action to achieve badly needed alternatives.

PHILOSOPHICAL DIRECTIONS

Underlining the decisions taken in this thesis to pursue the directions as proposed in the prototype (Chapter four) the author's intentions are:

1. To afford greater community participation in decision making through cooperative and communal social, political, economic structures.
2. To decentralize the power held by government and industry into manageable communities.
3. To curtail the extravagant and wasteful practices of current energy and resource utilization.
4. To construct a model that is affordable - i.e. supported by an agricultural and industrial base that provides community needs.
5. To create a more equitable distribution of urban and rural opportunities for the community by proposing a physical pattern that allows unhindered access to resources (work, etc.) and all aspects of a quality urban life.

6. To propose a new urban physical pattern that does not impose penalties on the less mobile or less fortunate.
7. To propose a model that provides for needs in order to permit a greater material security for the community.
8. To encourage the spiritual revival of the community by freeing it from by the competition for needs.

CHAPTER ONE
URBAN MALAISE

Architect and urbanist, Dr. D. Styliaras, writing in his book City 2000 + identified the undercurrents of urban malaise that flow unhindered whenever urban development or redevelopment is discussed. He states the overall problem as follows: "An overemphasis on technology, on organizational bureaucracy, on liberal land economics, on the exploitation of gullible and vain public attitudes has resulted in a city which is physically reduced to mere supply lines and services, land commodities, and building facilities, so that the terms 'development' and 'improvement' have purely economic significance" (City 2000, p. 34).

The rapid growth of cities in the last 30 years has infected the population with a set of beliefs that prevail in the face of any setback. Growth--the concept of an ever-increasing material well-being--remains unchallenged. Technology, bureaucracy, and laissez-faire economics have contributed to supporting the growth ethic--the ethic that by definition excludes any checks or balances. The concept of 'highest and best use' so favored by the real estate industry may not have any justification in the construction of a better city but nonetheless forms an essential component of the growth ethic.

Several assumptions underlie the belief that growth is the most important goal. Observers of urban decay ignore the causes and proceed to prescribe growth as a panacea, reasoning that feverish new development and expansion will somehow relegate the decay problems to the shadows of political and public consciousness. Fears are instilled in the populace that the limiting of growth will deprive them of their 'natural' birthright to expand into virgin territory, thus abandoning the 'old' for the new. It is assumed that a bountiful reward awaits those who aspire and work hard enough to achieve the promises of an affluent society--the rewards are always assumed as material, even though the purchase price constantly and rapidly rises. To suggest that a lowering of materialistic horizons is more relevant in our time is to many people a sacrilegious abandonment of society's goals.

The pursuit of growth for growth's sake has resulted in an urban pattern that resembles a bombed city in the centre and a cancer on the edge. Growth demands a vast infusion of energy and other resources that are quickly ransacked for their benefits and then disposed of in the most convenient (that is, least expensive) manner. The result has been the rapid depletion of non-renewable energy sources, the destruction of the world's forests and

unprecedented environmental degeneration. Air, water, and soil pollution is the result of just a few decades of quick and cheap resource exploitation; the growth ethic demands that the methods produce results as quickly and as cheaply as possible. It is inconceivable that such destruction could have occurred to our environment if society (producers and consumers) had had to pay the full price from the beginning of this growth period.

Technology has made urban growth possible in areas that formerly were too restrictive or costly. The draining of wet areas on the fringe of older cities, the re-routing of rivers, the flattening of hills facilitated urban sprawl and made it 'affordable'. Urban sprawl has resulted in the loss of millions of hectares of good, irreplaceable agricultural land throughout the world. It was assumed that everyone living in the older, compact inner neighborhoods aspired to a bit of 'land' around a free-standing single family structure. Sociologists and psychologists produced evidence that urban dwelling was a stressful experience and the rush to the edge (suburbia) was unprecedented. With the partially manufactured demand for single family housing strong, agricultural land could not be protected against the onslaught.

The mindless expansionist policies of the growth-at-any-cost proponents would not have been as successful if it had not been for the availability of very inexpensive energy. Evidence has surfaced that supports the idea of a conspiracy - a conspiracy to reduce the choices that a commuting public could have and to replace the good train system of the eastern United States with freeways and automobiles. Cheap energy was the key to the success of the automobile and tire companies in buying the railroads and purposely allowing them to degenerate at the same time that the concrete, asphalt and road-building lobbies were badgering the government for federal highway funds. The cost of energy was not a component when the growth formulae for success were written. The effect of these policies and of the former inexpensive supply of energy is now manifest in practically every industrialized country in the world.

The availability of inexpensive and seemingly inexhaustible supplies of energy and resources, combined with technological advancement and the ambitions of the mercantile mind have produced a 'commodification' of nearly all aspects of urban life. The demands of industrial growth pervade the urban dwellers' working and non-working life. The increasing scale of production has

demanded that efficiency become the major criterion. In order to ensure efficient production the worker is forced to repeat a few discrete operations thousands of times daily. The segregation of operations and the factory mentality of locating all functions in a 'grid' system have infected the consciousness of the city dweller. He begins to perceive his life as fitting into an efficient distribution of commodities in the city. This commodification that commercialism demands affects the city pattern directly: the city becomes part of the overall productive capacity of a highly technological and over-industrialized society. It 'delivers' goods and services and therefore must be designed in an efficient pattern. The dictates of ever-increasing monopoly control of production contribute to a large degree to the urban malaise.

The overemphasis on one way of getting things done has made a major contribution to the social component of the urban malaise. As cities expanded and more people left their workshops and neighborhoods to work in megafactories and live in amorphous collections of houses, several social problems developed. Communities that had slowly and carefully developed over a number of generations were destroyed; the result was alienation and a serious tearing of the social fabric.

The reliance on commercial relationships could not replace the long established ambiance of true communities. With the breakdown of community came the weakening of social responsibility (supported by the increasing competitiveness of commercial society). As social responsibility declines, environmental neglect increases. The almost universal use of motorized recreational vehicles allows an individual to 'play' alone and neglect his responsibility to society and environment, resulting in noise, air pollution and imposition on others.

The emphasis on the pursuit of economic goals does not by itself guarantee success and achievement of full satisfaction. Unfulfilled material needs (especially the desire for the single family house) further provide the drive for economic gain. Commodities are produced that are absolutely unnecessary for human survival, the production of which contributes to a worsening of the city environment. Competition for position in the society through commercial success dominates interpersonal relationships in a never ceasing cycle. The city perceived in these terms is simply a place in which to work; it is not perceived as being useful in a truly human sense.

Very important factors in the discussion of urban social malaise are those of scale and control. As the scale of production and organizational bureaucracy has increased, the abilities of the individual to control many aspects of his urban life have been usurped. This loss of sovereignty is one of the key problems that the author will address in chapter four through the presentation of an urban 'model' that restores individual control to the creation of an urban environment. The increasing scale has also become incomprehensible to the individual and community--the lack of access to information and an ever-increasing bureaucracy contribute to the feeling of helplessness and apathy. 'Massification' creates anonymity and isolation, which are detrimental to a healthy urbanity.

The dependence on the city solely for one's economic life condemns urban life to sterility and standardization and shapes the citizen's sensibilities towards the urban environment. If the city is perceived solely in economic terms, then the criteria applied to its growth and layout reflect industrial efficiency. The occasional 'human' touches (flowers and benches in commercial malls) are usually utilized to generate more income from a commercial activity or enhance the monetary value of the land. The concept of 'highest and best use' has contri-

buted to this entrenchment of property rights that demands economic return regardless of social consequences. Replacing 'outmoded' uses is usually regarded as growth and progress, and too often dictates the location and provision of good human urban facilities.

The discussion above has concentrated on the connection between social problems and the economic overemphasis of urban development. This single minded emphasis is reflected directly in the physical pattern that our cities have assumed. The accumulation of large amounts of capital and unprecedented profits allowed large developers to construct gigantic suburban areas solely for residential use and then connect them to the office tower concentrations by freeways. The entrenchment of this method of building cities remains. However, economic justification for its continuation is eroded almost daily by the increasing cost of energy and the decreasing supply of fossil fuel for private automobiles. It is this pattern of urban development that has made a major contribution to the depletion of fossil fuels through the over-reliance on one form of transportation (automobile).

As urban development shifted outwards, so did economic and political powers. The tax base fled the older residential areas and as the outer fringe populations increased so did their political power. The central city was starved for funds and decayed further. It is not to be expected that suburban municipalities would favor the distribution of tax revenues to areas requiring redevelopment. The lack of regional urban governments has contributed to the division of municipal powers; provincial funds are distributed to competing municipalities which strive to improve their service infrastructures at the expense of neighboring areas. As will be illustrated by planning legislation in several European countries (chapter three), a regional plan is of paramount importance and should precede local development.

As the title of the thesis suggests, and the definitions presented earlier clarify, the solutions to the problems encountered in the present-day city must be inextricably interwoven in an integrated structure that contains a great diversification of functions and is largely self-supporting. With that goal in mind, we can examine the existing city for its failure to provide sustenance and satisfying environments. This examination will be largely in physical terms, and the prototypical solutions presented

in chapter four will deal with the physical allocation of urban land uses.

The laissez-faire development of urban land has produced an unplanned hodge-podge of uses that are only occasionally controlled by zoning. It is zoning's main goal to segregate non-compatible uses--or those uses thought to be non-compatible. For the sake of expedient land division, large blocks of land are zoned into several use categories. Thus, workplaces and dwellings are separated and force the urban worker to commute. While profits are maximized by the utilization of zoning, the ultimate burden rests on the commuter. The 'unplanned' aspect of land division actually is very carefully planned--by those who stand to gain the most. Re-zoning older areas to permit high density results in windfall profits for the persons involved in the development process but frequently burdens the city and the taxpayer with an unmanageable mess. The indiscriminate use of zoning in a short term and near sighted planning context results in the 'economic' city discussed above.

The segregation of uses through the indiscriminate application of zoning creates the urban pattern prevalent

in cities. The separation of places of major activity--dwelling from workplace, recreation areas from both dwelling and workplace--dictates the mobility patterns that are choking the urban environment. Dispersed and fragmented, urban facilities demand individualized transport modes for servicing and use. The lack of purpose and focus contributes to an ever increasing helter-skelter and wasteful moving around in order for the urban dweller to satisfy his daily needs.

Movement in urbanized areas reached the crisis stage at least two decades ago but, instead of most cities responding to the challenge and instituting long range plans for the future, they followed the most expedient route. Urban sprawl was encouraged by the quick approval given to freeway construction that promised access to industrial areas and the central office districts. This highway infrastructure is one of the largest arguments against the construction of good public transit. It is argued that, since such a large commitment has already been made to use private transport, the shift to public transit is economically unjustifiable. Further, the argument accepts the low density sprawl that negates the benefits of transit uses. This typical head-in-the-sand position completely ignores the issue of future costs--

economic, environmental, social--that are increasing exponentially and making public transit more viable.

The despoilation of suburban areas through low density and dispersed facilities that require highway access is the pattern most visible in the 'additive' areas. The physical malaise of the older, central city is just as clearly manifest and probably has received less attention. In contrast to the new residential-only areas with their low density, the central city has become an unplanned explosion of high density requiring the movement of hundreds of thousands of persons into and out of its area daily. While residential areas contain dwelling spaces only, the central city has developed largely into an office and administrative center. Large complexes dominate the street-scape, destroying street level vitality and variety. Streets that contain commercial and office buildings exclusively are deserted and dangerous after 5:00 p.m.

The downtown pattern of office towers and parking garages precludes the urbanity that could exist in the daily market exchange of goods and services. A new 'trend' towards mixed-use structures is somewhat alleviating the sterility and banality of the central city,

but this is largely another exploitation of the need for urban services. Placing expensive apartments and restaurants on top of office buildings contributes very little to the life on the street and in public spaces. The new elite ghetto thus created does little to enhance the creation of good urban communities.

Too much emphasis is placed on physical modification by the planners who are projecting alternative urban form. To propose an altered urban design as a solution to urban problems without attending to the social ills is to propose no solution at all. Murray Bookchin succinctly clarified this issue in the introduction to his book, Limits to the City: "...to rescue urban life today would require a fundamental change in society, not just a new urban design. Important as design may be, it is a function of social life itself; and since modern society is basically irrational, it should not surprise us that city reflects and even exaggerates the social irrationalities of our time" (p. viii). As the first sections of this chapter suggested, it is the prevailing economic cycle that has contributed (to a large degree), to the urban malaise that we experience today. Profound economic and social changes are necessary prerequisites for the acceptance of alternative urban patterns.

The urban planner does not work in isolation, however. The economic and social changes will be achieved through the participation of all members of the urban community. Urban problems are seated firmly in the economic, political, and social institutions of our society. The physical problems are surface manifestations. Chapter two will present historical precedents that retain their validity and are refreshing alternatives to the city that we know. When reading chapter two one must be reminded that the examples presented were constructed under economic and social structures that were different from those of our largely bureaucratized and over-industrialized contemporary society. The reliance of modern urban population for all their needs on highly technological and centralized sources is unprecedented in historic cities. It is this lack of self-sufficiency that reinforces the urban form we tolerate today. The irrational insistence on the continuation of the economic and urban structures prevalent today must be dealt with before alternative urban patterns will be acceptable. Chapters two and three are presented to increase the awareness of rational urban alternatives.

CHAPTER TWO
HISTORIC
PRECEDENTS

The rejection of tradition and historic continuity is best exemplified by the appearance of most urban centres--dull monotonous streetscapes of large slabs and towers that are constructed as symbols to the prevailing ethos of progress and concentrated capital. The response to the demands of modern mercantilism has resulted in the virtual abandonment of urban areas that were perceived to be counterproductive in the strict definition of modernity. To attract investment and capital the managers of modernity believed that the replacement of historically valid urbanscape was necessary. Competition for height and glitter further contributed to the destruction and replacement of the 'old'. The new, the bright and shiny, were to portray progress, growth and a winning corporate attitude. The 'old' never stood a chance in this onslaught, and architects and planners were willing accomplices.

Exactly what constituted the 'old' and caused its demise? What elements still retain their historic significance centuries later and indeed can be resurrected (as several cities have begun to prove with heritage area designations)? To increase the awareness of ideas and features of the 'old' that are relevant for the modern city, the author has presented this chapter as a 'Lesson to be

Learned From Old Towns'. The examples presented illustrate some key principles that vernacular town planning embodies in dealing with outside forces such as severe climates and the diverse demands of pre-technological societies.

The elements that the old town was composed of are still valid today, even though the conditions for their applications have changed and technical and sociological changes of great magnitude have occurred. The earliest examples of good town building are those that are commonly referred to as vernacular architecture or also as anonymous, spontaneous, or indigenous architecture (Bernard Rudofsky). Vernacular architecture as practiced several centuries ago can be interpreted as built-form that is a in response to socio-environmental determinants. The compact forms that usually resulted were inspired by the society and the site. The site determinants included:

1. Agricultural Requirements: The land that was suitable for food production was inviolable. The drainage of swamps and large irrigation projects were not possible, thus reducing the amount of land suitable for agriculture. Elaborate terracing techniques were developed to increase the supply

of productive land as the photograph below illustrates. (See also the Tachai project in Chapter Three).



Fig. 1 Terraced fields--China

Rural values in concert with urban (town) values created the compact hill-towns we are all familiar with. The maximization of land suitable for agriculture and that suitable for urbanization was characteristic of much vernacular town building.

2. Protection: Marauding pirates and rival factions influenced the pattern adopted by early town-builders. A hill town reached by one path was much more secure than one located on a plain and accessible from all sides. Other natural defenses such as bodies of water were often utilized as well as clandestine locations reached only by arduous journeys through deserts or mountains.

Fig. 2 Peniscola, Spain



3. Symbolic Significance: The construction of towns in prominent locations, yet following the dictates of climate, agriculture, and protection; was favored whenever a strong statement was required regarding militaristic or monarchistic power. The acropolis of the town became the fortress with the rest of the town huddled at its feet. Seen from afar (across a plain) the town portrayed symbolically the power of the state within.

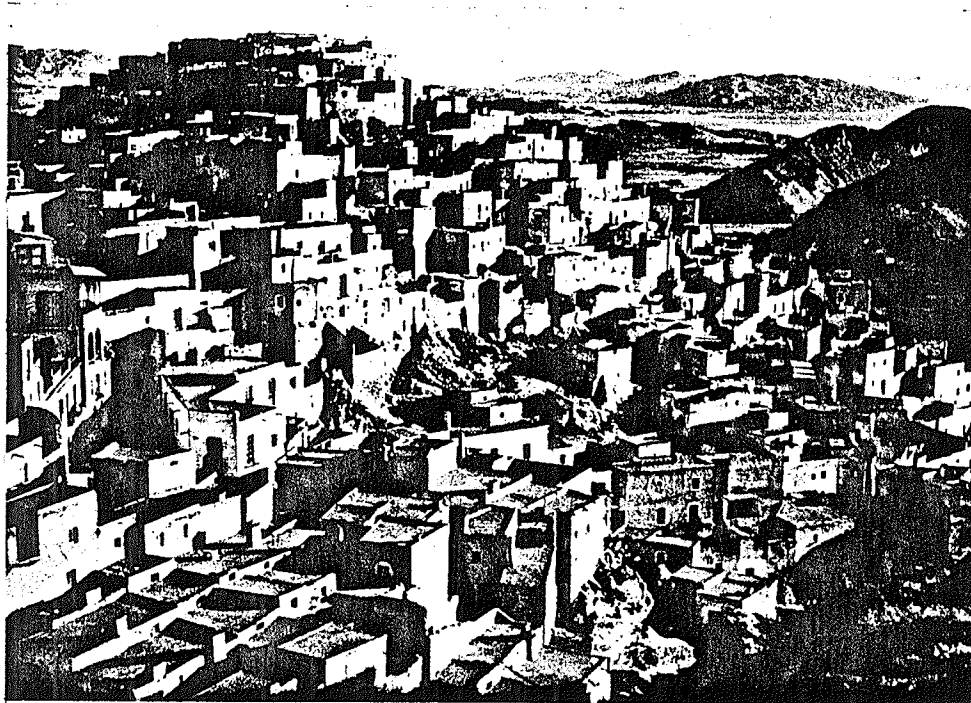
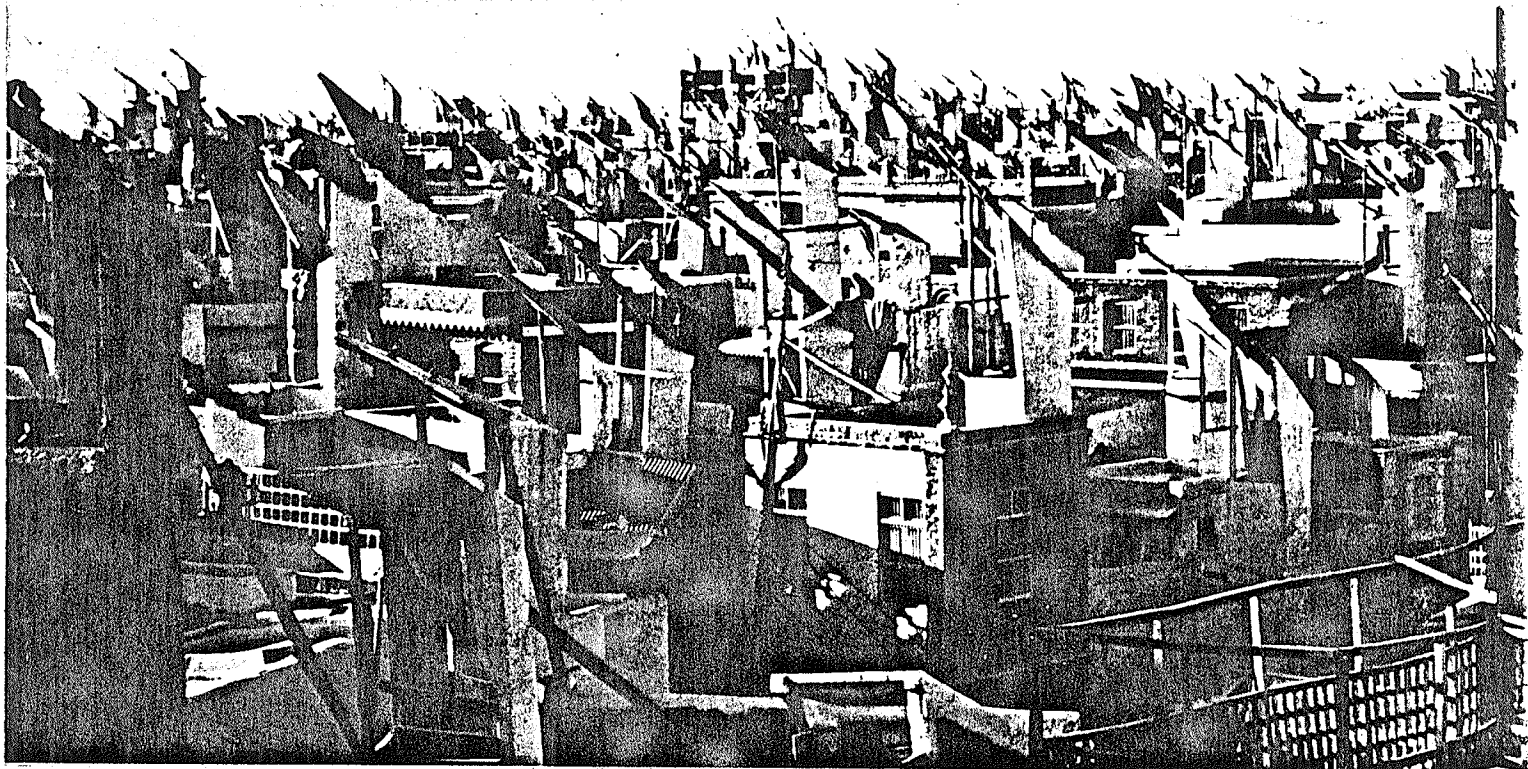


Fig. 3 Mojacar, Spain

4. Climate: Possessing a good knowledge of local and regional climatic conditions, the indigenous town builders responded to climate directly--from the closely cloistered casbahs to eskimo igloos. Climatic conditions were paramount in determining form of buildings as well as town layout. The type of building materials available often were climate-determined as well. Orientation to the sun and winds resulted in communities planned with climatic criteria foremost--the influence of the architect/planner did not exist to overcomplicate the solutions.

Fig. 4 Hyderabad Sind,
West Pakistan



The social systems that were responsible for construction of the historic towns were too diverse in form and content to elaborate upon here. However, an analysis of the towns constructed by vernacular builders demonstrates a few typical characteristics.

1. The importance of community: The concept of individual self-fulfilment taking precedence over community needs is largely unknown in early town-building. The emphasis on community needs ensured that the general welfare of the settlement would not be subordinate to the individual pursuit of profit and gain. The community provided the infrastructure in which the owner - occupier could shape and define his environment. This did not result in self-centeredness but further strengthened community infrastructure. Communal patterns such as those portrayed in Zanzibar (without the necessity for elaborate town planning to control rival factions), illustrate that community needs were perceived by individuals whose role in the society could not be one of isolation.
2. Workplace associations: The medieval town and city provided the background for the creation and strengthening of craft guilds. Early capitalist

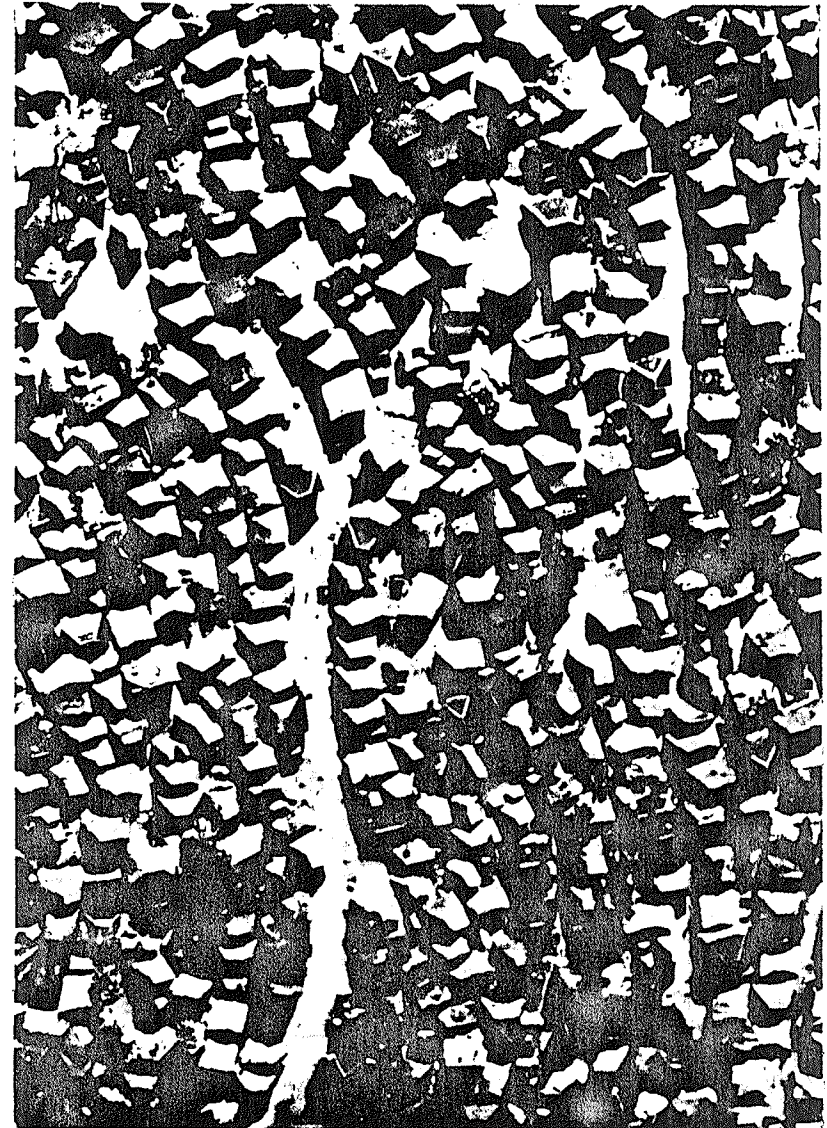


Fig. 5 Zanzibar

development was able to reconcile the aspirations of many divergent groups and the guilds were utilized as stabilizing forces. Essentially, the medieval town is composed of many markets, some large ones that deal exclusively in one commodity and many other local (smaller) markets located along almost any street. The craftsmen through their guilds operated workshops and store-front commercial outlets, as well as engaging in inter-regional trade. The medieval town reflected this primary concern with guilds and markets and as a result became a place of lively exchange.

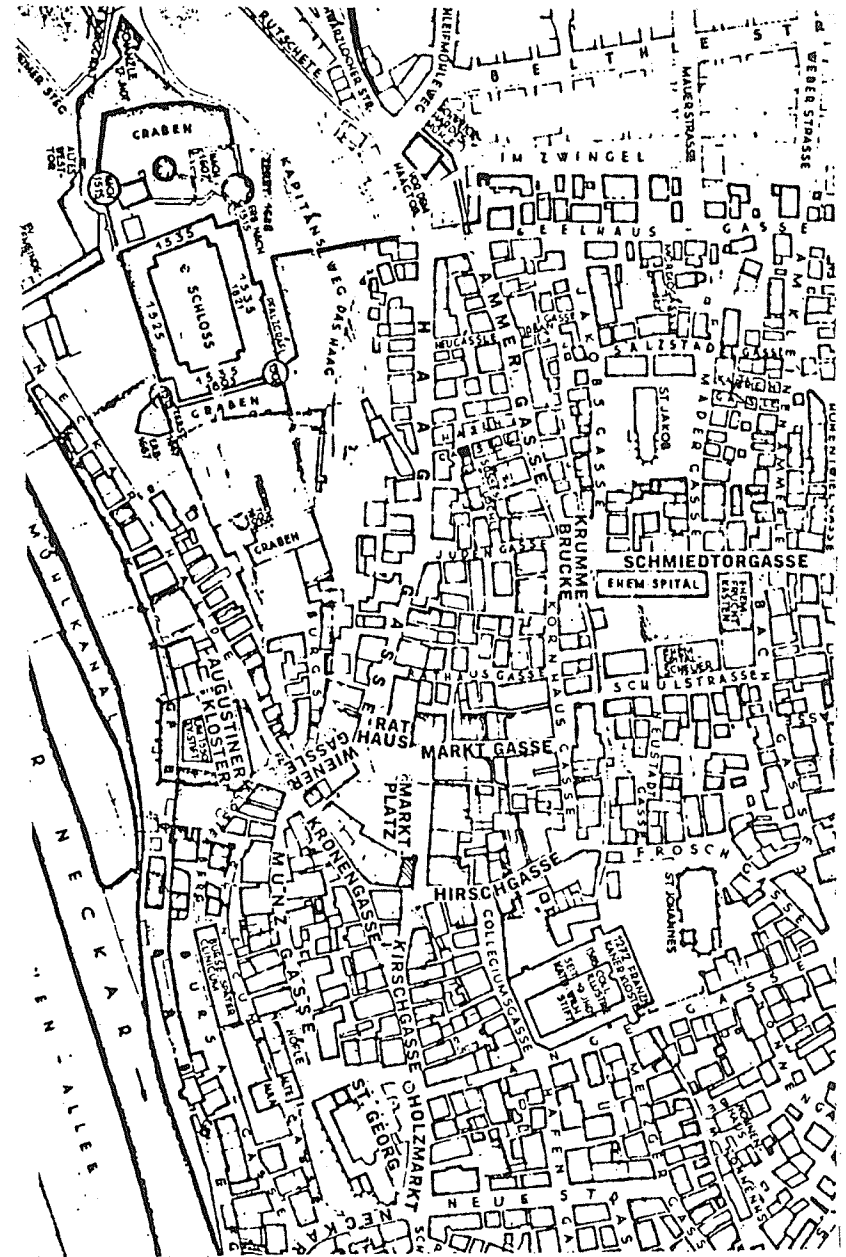


Fig. 6 Medieval
Town Plan

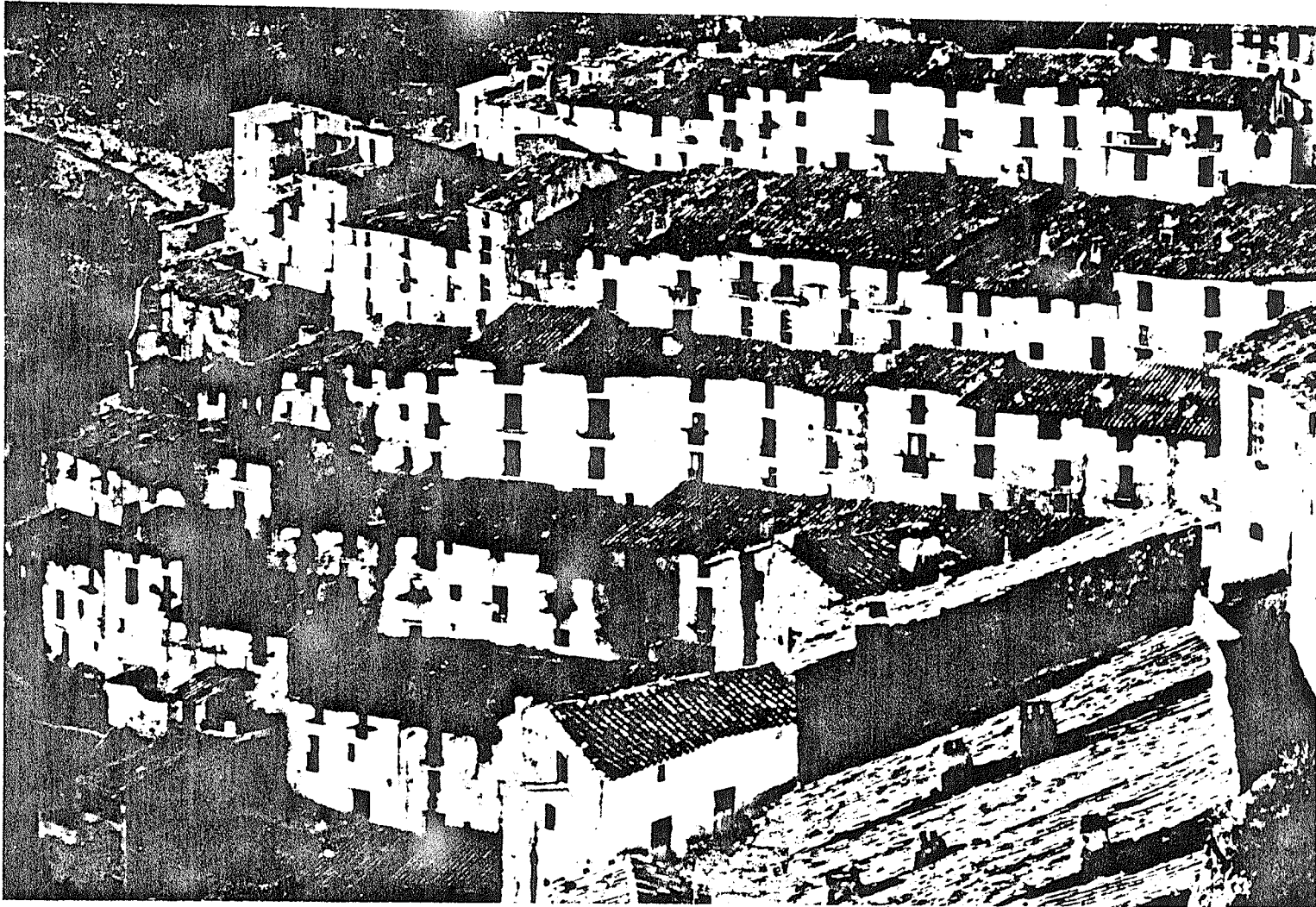
The lesson of old towns encompasses many areas that planners are trying to comprehend and propose solutions for. The over-complication of urban problem-solving creates ever increasing and insoluble problems - the largest of which may be increasing size. The valuable lesson learned from old towns is that there are limits.

The recognition of limitations on urban growth was a well-accepted criterion of urban development until the industrial revolution. The sustaining ability of the land and support systems was of paramount importance. Local and regional self-sufficiency was absolutely important, especially in harsh climates. Expansion was limited in many cases to the area that could be defended against attackers or the area that could be used for construction (mountain top villages, hilltowns). There was no recourse to technology or a national relief fund if flood or crop failure struck.

A predominant impression that a traveller receives when visiting an Italian hilltown or a Greek village is the humane scale of the layout and the architecture. The shapes of the structures are usually simple (squares, rectangles, barrel-vaults) and combined in a variety of orientations and positions. The repetition of a few forms did not result in sterility and monotony as has modern prefabrication.

'Unit' architecture (the repetition of similar or identical details) is well handled in creating a balance between unity and diversity as is illustrated in Villa Hermosa, Spain.

Fig. 7 Villa Hermosa, Spain



The combination of scale, form, material and texture creates a human scale that has recognizably been determined by man as the measure. Social gregariousness is enhanced by the density and communal arrangement of facilities. The village square and marketplaces are places for the exchange of information, whether political, commercial or social in nature. The 'forum' could occur anywhere that the necessary facility was provided--whether it was a covered arcade or large open or covered markets. As a result, social and cultural exchange was not inhibited by being proscribed to distinct locations.

The difficulty of capturing the human quality of old towns is felt whenever one attempts to construct (duplicate) the form without the substance. A pseudo-vernacular medieval town constructed in an urban area populated by commuters is completely invalid and negates all notion of responsible urban planning (and indeed may be very inefficient use of land and resources).

Pietro Belluschi (quoted by Saalman) refers to communal architecture as "...a communal art, not produced by a few intellectuals or specialists but by the spontaneous and continuing activity of a whole people with a common heritage, acting under a community of experience".

Traditional communal architecture was not 'devised' or foisted on the populace; it reflected a common heritage and was constructed within a community that shared experiences. These community experiences took many forms--social, political, economic--and were related to immediate and commonly perceived conditions.

A very important shared experience was that of employment. The most prevalent arrangement was that the workplace was usually just a few steps from the dwelling. Thus the 'form' was not injurious to the notion that work and the rest-of-life are inseparably components of a person's whole existence. Most of the work of course was craft-related and therefore the perception that work was a useful and satisfying occupation of one's time contributed to the general human-ness of the town. Time and motion studies had not yet diminished the satisfaction of work and brought about the destruction of creative production.

The 'community of experience' was also greatly enhanced by the participant role of the town's occupants. The

owner - occupier played a large part in shaping his own environment or in preserving its qualities. To construct towns displaying a strong communal nature the inhabitants must value co-operation above individuality. This is not to say that the individual cannot express himself creatively--in his art, his work, his particular philosophical orientation. It is rather to emphasize that the general welfare of the populace is not subordinate to the individual pursuit of profit and progress. The village of Tachai (chapter three) displays the Chinese version of this concept - the concept that wealth is defined by the well-being of all inhabitants of the town, not by the personal accumulation of a few privileged individuals.

CONCLUSION

The relationship to site and climate, the communal organization required to build the towns, and the harmony of urban and rural forces are all concepts that are relevant in modern town planning. As chapter three will display in the work of Bakema, Candilis, Josic, Woods--and the village of Tachai--it is possible to create modern urban patterns that are well suited to site and climate, can be built and operate with community participation, and can ultimately serve as models for urbanists. The historic examples presented in chapter two can be utilized as prototypes if properly understood and implemented.

**CHAPTER THREE
CONTEMPORARY
SOLUTIONS**

A valid approach to urban planning must combine the lessons learned from the study of historic precedents with lessons offered by valuable contemporary urban models and possibilities. The contemporary examples chosen for analysis are those plans and designs that have contributed directly to the prototypical design presented in the next chapter. The examples are mostly linear in overall composition and stress pedestrian orientation. Although other contemporary examples were studied briefly, those which were oriented toward automobile circulation patterns and low density dispersal of land and building uses are not relevant for the future city. The typical pseudo-suburban towns proposed or built in the United States have not been included--they are considered by the author to be failures, lacking density and fabric necessary to create suitable urban centres.

This chapter will present:

1. an historical review of new town planning in several countries,
2. an analysis of the new town of Toulouse Le Mirail, France (Candilis, Josic, Woods),
3. the work of Van den Broek en Bakema and the Amsterdam extension proposal, and
4. a new town constructed in China (1962-1967) that exemplifies the close connection between rural and urban development with the emphasis on skillful and nonwasteful resource utilization.

NEW TOWNS: HISTORICAL REVIEW

ENGLAND:

English planning legislation of the Post World War II period encompassed policies that were regional in scope and often were part of a national development policy. The new Towns Act of 1946 stressed a policy of decentralization and concerned itself with locating areas for employment. It can be interpreted as the first significant act in modern planning history that sought to achieve a comprehensive and large area plan. Dwelling and employment places were considered of equal importance.

Also in 1946 the Abercombie Plan was proposed as a solution to relieve the severe overcrowding of London. It envisaged the expansion of towns located in the London region and the construction of large housing estates with low population densities. The Keith Report proposed that fourteen new towns be constructed (1946-1950) and sited 20 kms from the older centres. For each new town a population of 20,000 to 60,000 was projected (density = 30 people per hectare). A green belt (1200 metres wide) around each new town was proposed to provide ample recreation space.

The Keith Report (1946) presented details for a development corporation to control the infrastructure preparation and housing construction. The corporation was to be responsible for the planning and administration of each new town, acquire the necessary land, and construct the necessary public housing. Other details presented in the report outlined the area required:

60,000 people	= 2,000 ha
green belt	= <u>2,400</u> ha
Total	= 4,400 ha

The town centre was to provide 4 ha per 10,000 inhabitants and the people were to be grouped in neighborhood units of 5,000 to 12,000 each. 4 ha per 1,000 persons for leisure areas and 1-2 ha per 1,000 persons for school areas were also stipulated in the Report.

These early new town policies and plans were essentially breaking new ground, and were conceived in a period of need and desire to rebuild a war damaged country. Of great importance was the emphasis on creating employment along with new housing. Ideally, the planners desired to make housing available in new towns to those

persons who had also secured employment locally, thereby reducing daily commuting. In practice, however, the low density of the early new towns contributed to the increased use of private automobiles--a world-wide-post-World War II phenomenon.

The initial new towns in England displayed some serious shortcomings that the author will deal with in his prototype design. One of the most prominent was the lack of employment balance. Industries usually were primary or secondary--tertiary industries including service-oriented employment, were non-existent. Tertiary employment lends a balance and variety to urban work that certainly would have contributed to a busier and livelier town. The early new towns also suffered from a lack of facilities and an absence of spontaneous social life--two of the key ingredients in a true urban community. The population balance of these towns was skewed towards young families who centered their activities in the home and did not contribute much to community life.

These problems can occur in any community, new or long established, but they seem to emerge and are most

strongly felt in newly-built towns which lack history and social and cultural continuity. The challenge is to design new communities with urban elements well defined and integrated so as to foster community spirit.

The later (1960's) English planners were aware of the shortcomings of creating isolated new towns and the South East Study (1963) changed the policy so that new development was linked to existing towns. Axial or corridor development radiating in all directions from London was proposed. The advantages of this plan were:

1. Existing and proposed lines of communication would be optimally utilized.
2. Large open areas for agriculture and recreation would be preserved.

The South East Study was followed by the South Hampshire Study (1966) which considered three basic forms that new urban development could take:

1. **Concentric Pattern:** Considered too rigid. No expansion possibilities, inflexible, and static. A pattern incapable of responding to changing requirements.

2. **Rectangular Grill:** Considered unbalanced in its layout, with no natural centre, and unsuitable condition for public transport.

3. **Linear Pattern:** This layout was favored because of its greater flexibility and adaptability and was the most suitable for public transportation schemes.

The South Hampshire Study fostered the Bletchley proposal (1967) which later became the town of Milton Keynes.

The Bletchley proposal follows the principles of linear patterning. The main centre is laid out linearly with four series of small compact residential nuclei on a linear pattern parallel to the centre. Four large industrial areas are located at the ends of the lines of residential development. A road network serves the individual nuclei as does a system of public transport (elevated mono-rail). Pedestrian circulation is separated from these traffic routes. The area surrounding the town is maintained for farmland and recreation.

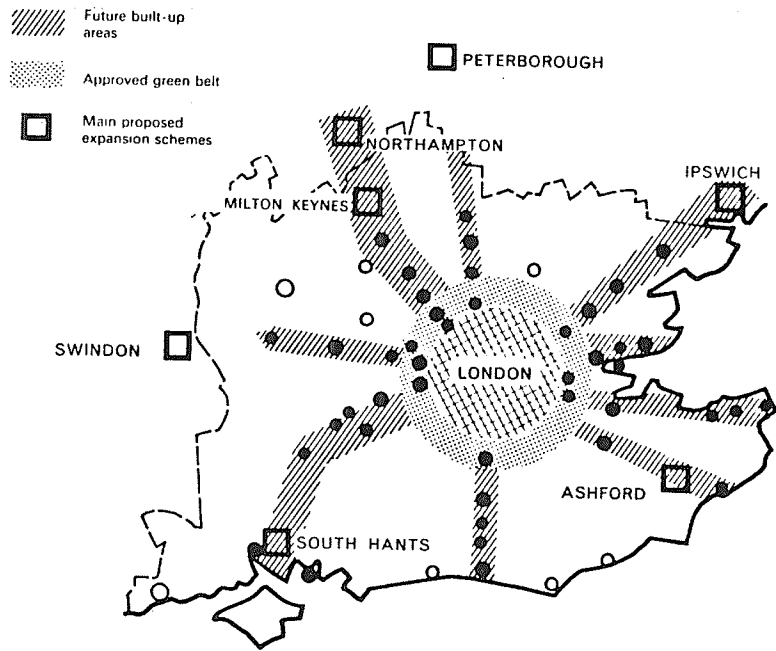


Fig. 8 London

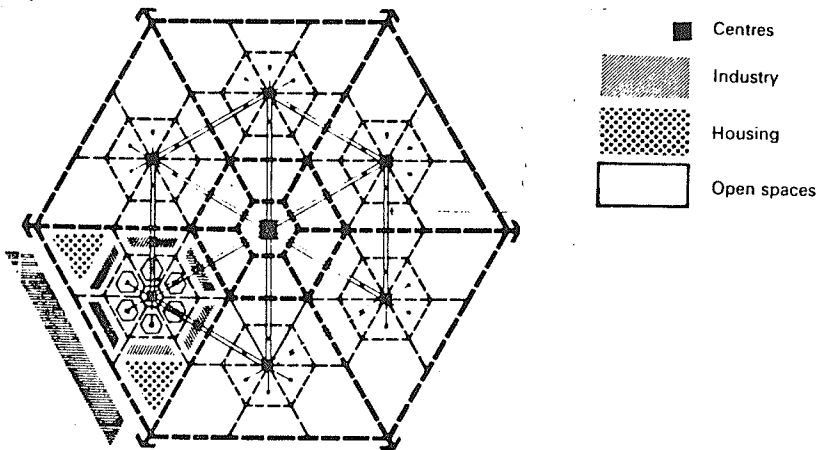


Fig. 9 Concentric

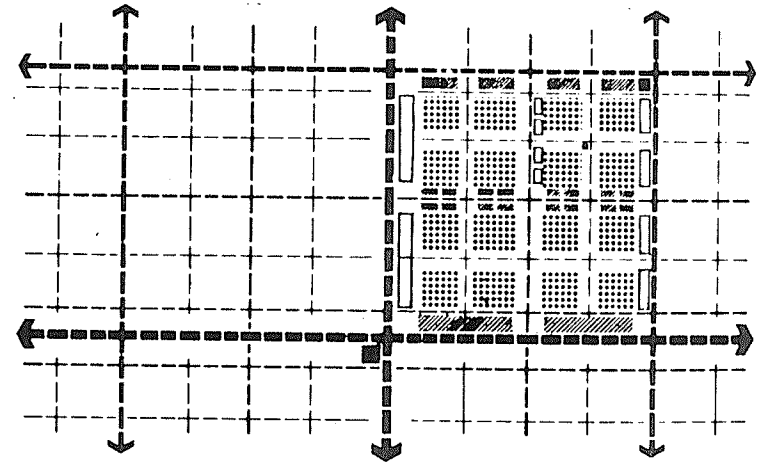


Fig. 10 Rectangular

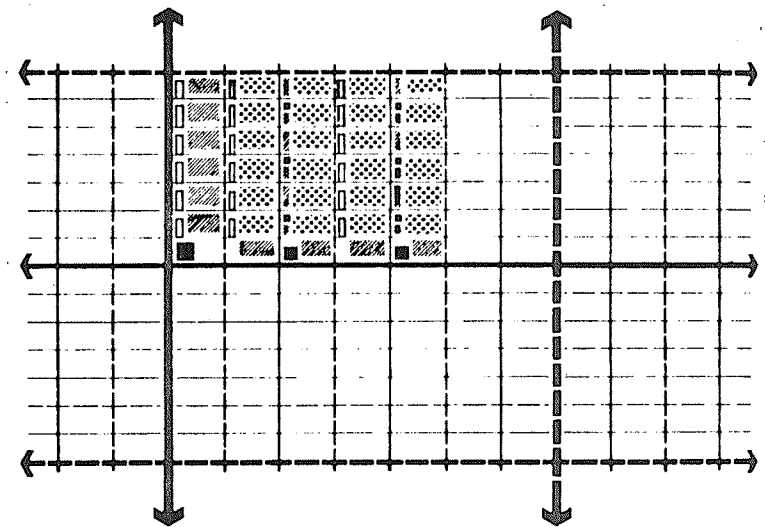


Fig. 11 Linear

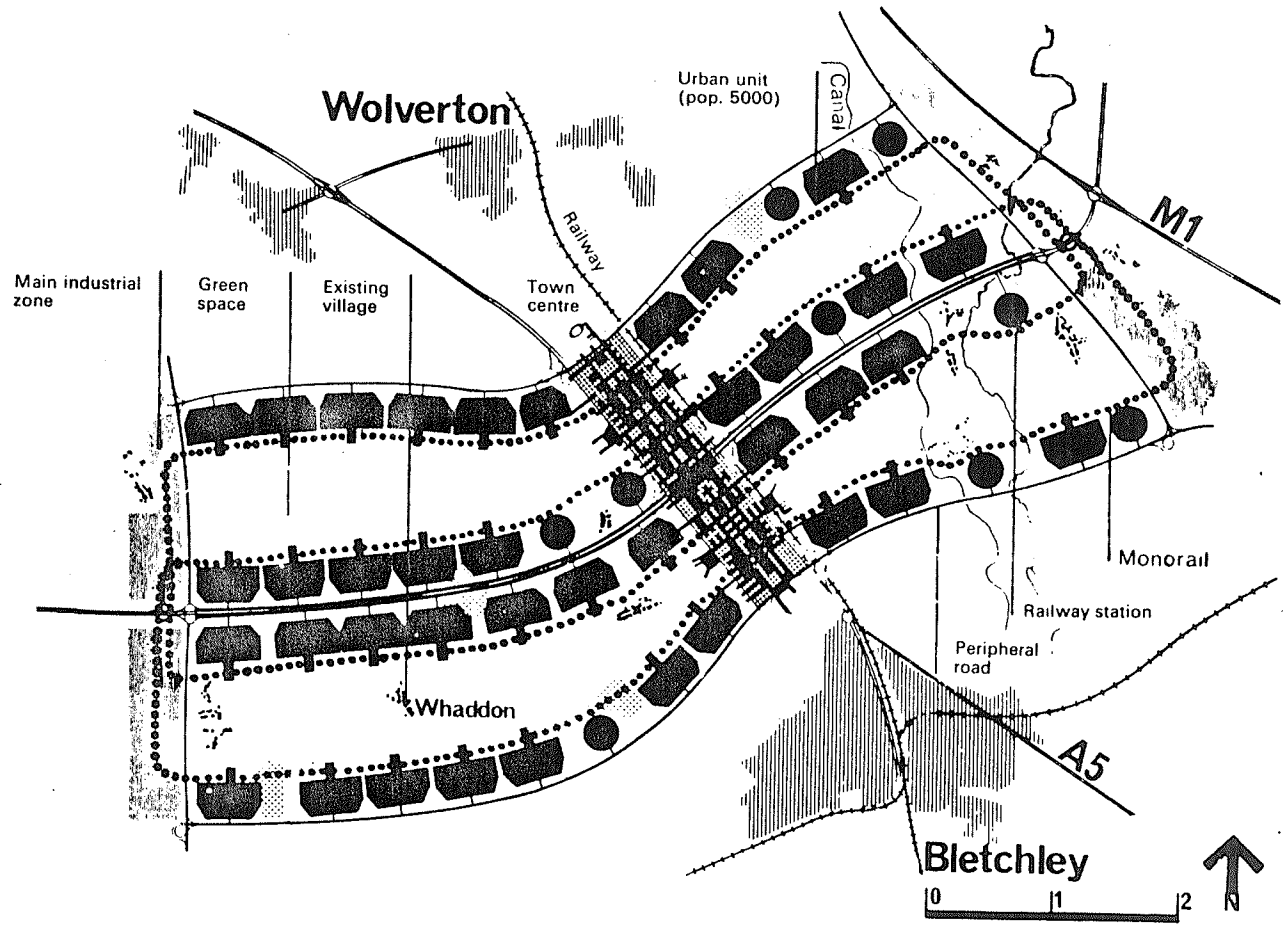


Fig. 12 Bletchley

Bletchley is a significant proposal in that it deals with the interaction of several urban forces and manages to combine them in a relatively compatible manner. The residential areas are all linked to each other, to the centre, and to the industrial areas by public transport. The housing faces linear green areas and the public transport is located between the housing and the green spaces but is constructed as an elevated system so as not to destroy the residential-green space connection. The transit stations are located at intervals of 1.2 km, thus the maximum walking time from house to station is approximately 7 minutes. With 5,000 persons per housing nucleus the density equals 125 persons per hectare--the environment is small and compact but varied (individually designed) to avoid monotony. It could be imagined that the centre would be the liveliest urban place in the entire town, supported by the mix of population and land uses that foster the urban spirit envisioned by the planners.

SCANDINAVIA:

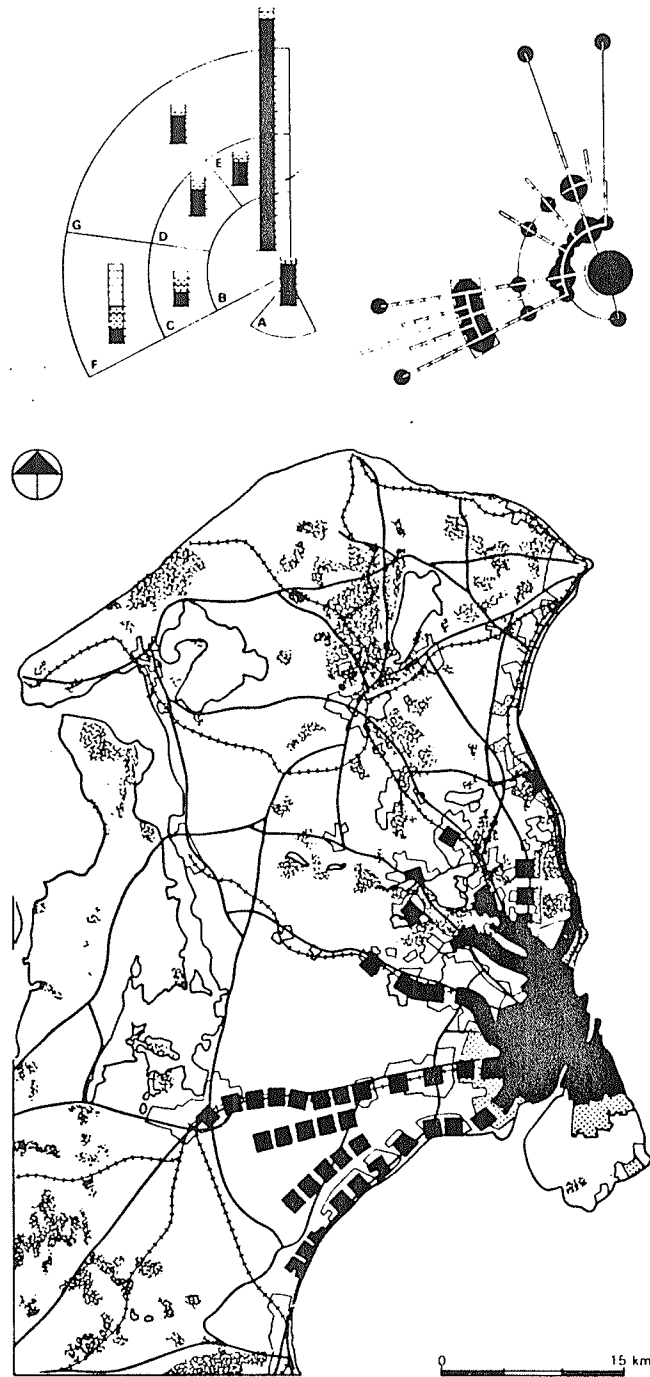
Of special relevance to this thesis is the 'finger plan' of Copenhagen, Denmark (1947). The plan is essentially regional in nature and proposes that development occur along axes served by railway lines. Each development is

to be separated by guaranteed green spaces, that is, the plan empowers local councils to acquire land to avoid speculation and designate areas for development and areas for agriculture and green space. In this manner, there can be guarantees that the pressures of speculative development will not erode the open areas and that the development areas will always enjoy good access to the countryside. The 1952 plan reinforced this concept and proposed lines of satellite towns linked to the underground railway system. Neighborhood units of 10,000 to 20,000 persons were to be located within a radius of 500 metres from each station.

Copenhagen, Stockholm and Helsinki share common characteristics regarding town planning that have relevance to the principles embodied in this thesis:

1. Role of the Capital:

The Scandinavian new town proposals do not stress complete decentralization but emphasize and attempt to enhance urban concentration. Positive aspects of density are identified and the importance of the capital (large) city is recognized--i.e., its ability to provide exchanges of economic



Town planners' proposal

At this stage the extension of the 'fingers' towards the town of Roskilde and Køge Bay is stopped up and includes the setting up of town sectors with populations of 250 000 whose links with the city centre and the rest of the region must be assured, as well as with Sweden (Malmö in particular)

1. Housing

- Unit of 10 000 dwellings
- Dwellings planned by the transport engineers
- Number of dwellings planned for the first phase
- Number of existing dwellings 1962 - 1963

Land including

- A** The island of Amager
- B** The towns of Copenhagen, Frederiksberg, Gentofte, Hvidovre and Rødovre
- C** The areas inland of Roskilde and along Køge Bay, including Tåstrup and Ishøj
- D** The areas inland of Frederikssund and towards Farum, including Måløv and Farum
- E** The areas inland of Hillerød and towards Helsingør, including Birkerød and Hørsholm
- F** The areas on the outskirts of Roskilde and towards Køge Bay, including the nearby towns
- G** The remainder of northern Zealand

2. Urban centres

- Centre of Copenhagen
- Large new centres
- Large secondary centres
- Local centres near railway stations
- Main road links
- Main road and suburban rail links
- Area of urban extension
- New motorway

3. Public transport in the urban area

- Areas with good public transport services (less than 30 min. from the city centre with through services, at least 3 an hour in peak periods)
- Areas with fairly good public transport services to the city centre
- Areas poorly linked with the city centre

Fig. 13
Copenhagen

information, administrative services, study centres, and a full range of services that have developed over a long period of time and could not be easily re-created elsewhere. The capital also provides employment and related amenities for a highly skilled and professional populace that would be reluctant to live in small or isolated communities.

2. The Importance of Urban Centres:

Each new town was to contain an urban centre that would not rival the centre of the capital but would provide a variety of amenities and activities, employment opportunities, shopping facilities, leisure areas, and a local or regional administration centre.

3. Freedom of Choice:

In direct opposition to the ideas of the English planners, who insisted that a direct link exist between employment and housing allocation, the Scandinavians chose a more balanced approach. The new towns were not regarded as completely independent units but as places that could provide housing and work places in situ or the possibility of commuting (public transit) to the capital for employment.

4. Physical Patterns:

Preferential Directions: The earlier concentric patterns were abandoned and a choice made to limit the direction of development to a few 'preferred' directions. The determination of which directions were to be utilized depended on the choice of which areas were to be protected (retained as open or agricultural). Recreation areas located between the lines of development were easily accessible by all the inhabitants. The policy of preferential directions therefore ensured that large areas devoted to recreational uses would be preserved forever.

5. Transport - Housing Relationship:

Emphasis was given to public transportation modes, and the use of private transport was de-emphasized to the extent that, for the Stockholm plan, projections were that by 1980 only 10% of daily commuters would be able to reach the center by automobile. This emphasis also permitted the government to prepare the infrastructure (transport system) before the erection of buildings and related services. The housing areas were to be no larger in radius than 500 metres from each transit station and the predominant housing types

were tower blocks and blocks of apartments (low-rise). Thus the density of housing justified the transit line and the location of stations. The correlation is direct between the efficient use of transit and the necessary density (efficient use of land) to support the mobility infrastructure.

As the prototype presented in chapter four will clearly demonstrate, these five Scandinavian principles are achievable in a Canadian context and are still relevant--especially given the recognition by policy-makers that scarce resources are forcing Canadians to change their approach to the way in which regional and urban land is utilized.

NETHERLANDS:

In 1966 a national master plan was prepared, outlining the general development desired, as well as concrete suggestions for implementation. Town plans were prepared and financial support was given for the provision of employment and services in the new towns. The planning authorities viewed their role as creating political and psychological measures to achieve the national goals.

The Amsterdam master plan for expansion was given prominence and followed the linear model. Railway stations were to be located 700 to 1,000 metres apart with 80% of all housing within 500 metres of a station. Access to green spaces, as well as a system of cycling tracks were also important features. The centres of each nucleus along the transit line were to include socio-cultural facilities in addition to employment and service facilities. One such proposal will be presented later in this chapter.

Less successful was the implementation of the new town plan of Lelystaad. The major concerns were to surround the new town with a green belt and locate green spaces within the centre itself. Observers of the construction of Lelystaad have concluded that work was begun without much regard to the plan (which was perceived as unrealistic), thus negating an opportunity to achieve coherence. The absence of a long-term implementation schedule and the lack of an official body or corporation to control and be responsible for the construction of the new town resulted in haphazard development, much like that of contemporary unrestricted urban areas.

FRANCE:

New towns planning policy in France was preceded by the 'grand ensemble' or large-scale housing estate idea that quickly became known as 'scarcellite'. These monotonous estates composed of a youthful population were completely devoid of any amenities and were no more than bedrooms for commuting workers. The Master Plan for the Paris Region (1965) recognized these shortcomings and proposed the creation of new towns in suburban areas to revitalize and urbanize areas that were left isolated by earlier suburban (residential-only) development. The Master Plan recognized that a large population was necessary to attract 'urban' features--office jobs, specialty shops, theatres, recreational facilities--and examined the main aspects of town life -employment, leisure, transport.

Also recognized was the essentially regional scope of creating new towns to handle increasing urban populations. The Paris region master plan presented here illustrates the large planning framework (regional) that was deemed necessary to balance development forces.

The later study for the new town/urban intensification project for Evry (1969) dealt with the creation of an urban landscape with continuity: central area, social amenities, public transport. The new town of Evry was to be incorporated into an existing residential area that lacked urban features.

In 1968 a study was commissioned for the new town of Argy-Pontoise, the basic aims of which were:

1. phasing the various stages
2. emphasizing open - air leisure activities
3. balancing local employment with resident working population
4. emphasizing importance of external contacts.

To summarize some general characteristics of the Paris Region master plans within the framework of the clearly stated goal to maintain the unity of the urban region by linking several new centres into a network of urban centres:

1. The urban centre is assigned the major role in revitalizing former housing areas and giving a strong focal point to the development.

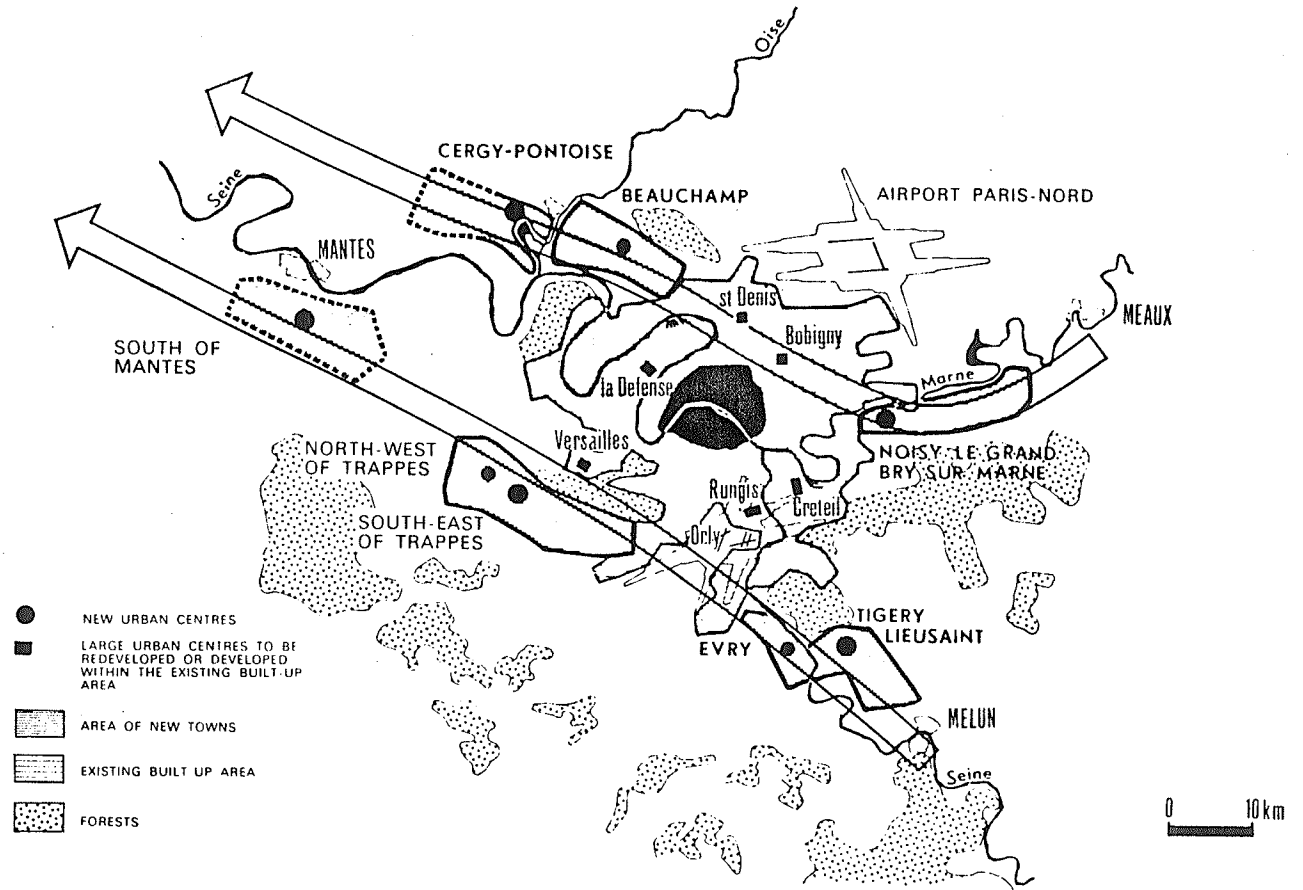


Fig. 14 Paris Region Master Plan

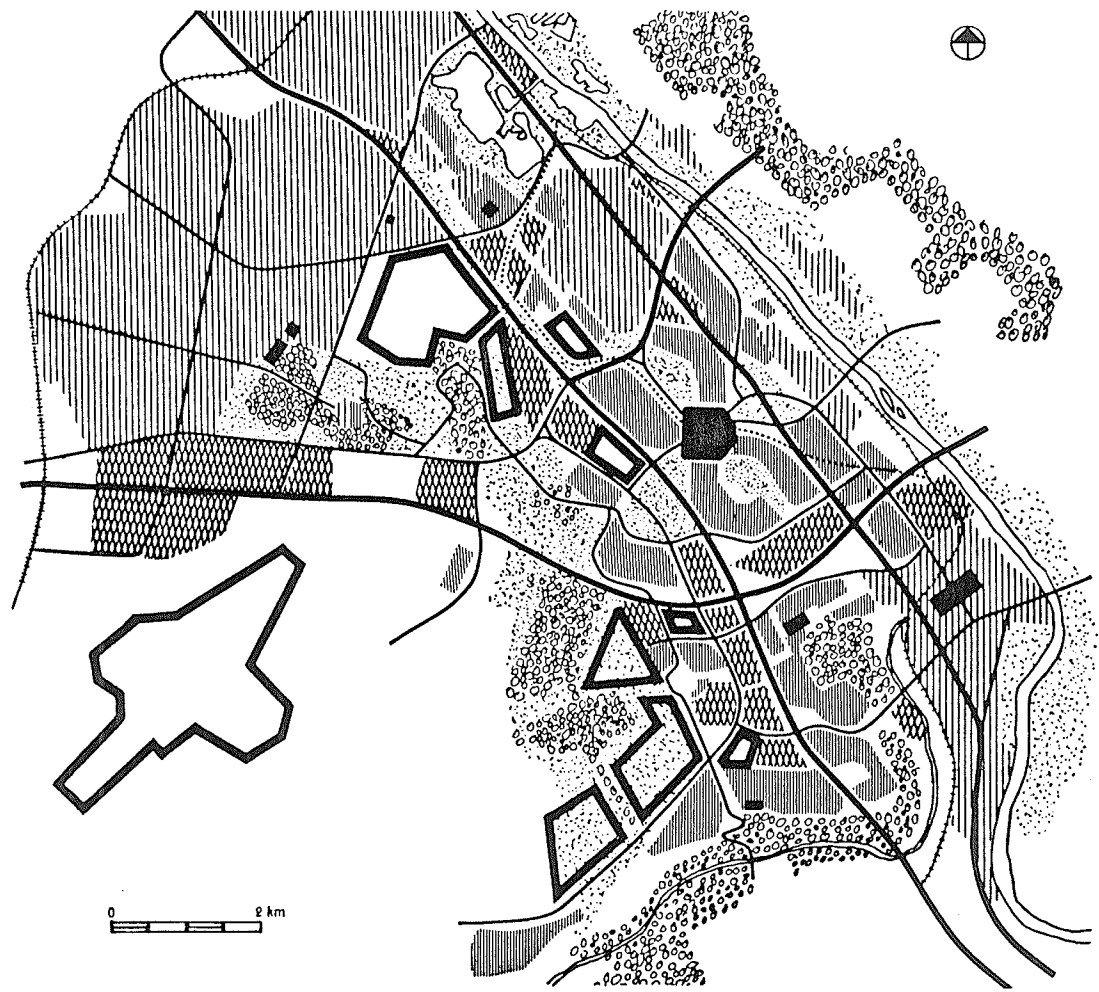
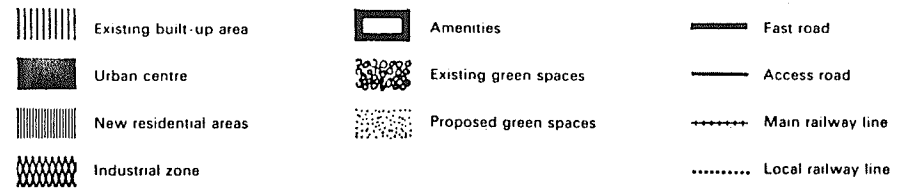


Fig. 15 Evry

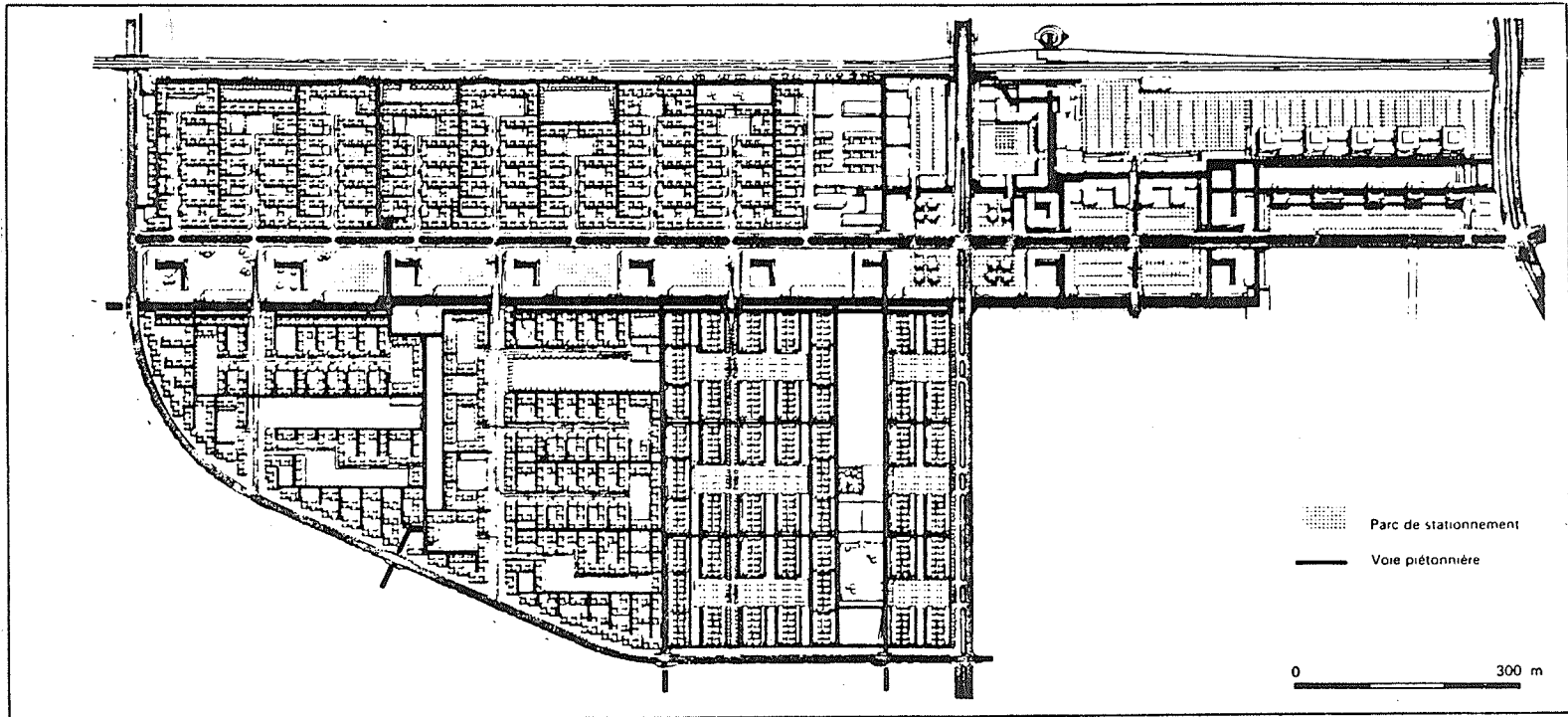


Fig. 16 Albertslund

2. Leisure areas land and water are important.
3. A balance is to be achieved between work in the new town and the resident population. The possibility of choices for the inhabitants is ensured.
4. Infrastructures for public transport are emphasized and limits are set to private auto use.
5. Planning flexibility is desirable to achieve and ensure balanced communities that change over time.
6. A continuing search is undertaken for interdependence between various elements in order to achieve interconnecting wholeness in an open-ended model.

A new town that typified the dangers inherent in allowing an over-engineered, super-rationalized master plan to displace the original well-intended goals is Albertslund. The plan illustrates the shortcomings of planning goals that focus on zoning, especially when rigidly applied. This results in an excess of uniformity and visual monotony. The buildings and the layout produced in Albertslund lend

themselves to prefabrication and ease of construction with lower costs but fail as urbanizing elements. (Prefabrication does not necessarily mean sterile environments; it can be effectively utilized to create variety and vibrancy.) Another criticism of new towns like Albertslund is that they were not created to be self-sufficient, hence the town centre only provides goods and services. Most other urban activities are lacking. This allows prefabricated uniformity to be applied indiscriminately.

TOULOUSE LE MIRAIL:

The area of Le Mirail in Toulouse, France was chosen by the local council as the primary development area and a competition held in 1960 resulted in the selection of the design submitted by G. Candilis, A. Josic, Sh. Woods, for a new town of 100,000 inhabitants.

As the plan of the pedestrian traffic patterns illustrates, the main ideas of the plan were:

1. predominance of the pedestrian
2. adaptation to the site
3. avoidance of monotony

4. definition of the specific character or identity of the new town.

The intentions of the architects/planners were therefore to create a permanent urban framework that could be built in stages over a period of time and be adaptable to changing conditions. The elements of this infrastructure are:

1. the Linear Street--highly concentrated activities and density of collective life.
2. communications system
3. continuous green spaces

The functions of the street are stressed throughout: the street is the element through which a citizen of the town finds his 'place'; it has a 'primordial' function in the life of the town; the street belongs to "... the children and the elderly, the hurried and the idle, the lookers-on and the looked-at, it should enable spontaneous demonstrations and daily activities ...the street is for all" (Candilis, 1975). The street therefore functions as a community meeting place.

The first stage in the construction was a new town in itself and was constructed along a linear green area that existed--gardens and parks that were on existing residential estates. On this 400 hectare site was constructed a Linear Centre, 4 metres above ground, containing collective functions and the highest residential density. The raised platform or 'artificial soil' was to contain light weight transportable structures that would be rearranged according to need and serve undefined temporary activities.

To increase the self-sufficiency of the new town, several centres were provided to enhance urban activities--shopping centre, cultural centre, social centre--arranged along the linear centre or a street. The intention was to achieve a mixture of activities necessary to support good urban life. Commercial outlets were to provide food, clothing, and other necessities. Other facilities included banks, bookstores, doctors' and dentists' offices. Nursery schools and day-care centres were provided along with multi-purpose rooms, theatre, cinemas. Public facilities include a gymnasium, indoor swimming pool, library, meeting rooms, exhibition spaces, workshops (multi-use). A social health centre and housing for the elderly were also present in the centre.

Lageplan Wettbewerb

Plan masse concours

Site plan competition

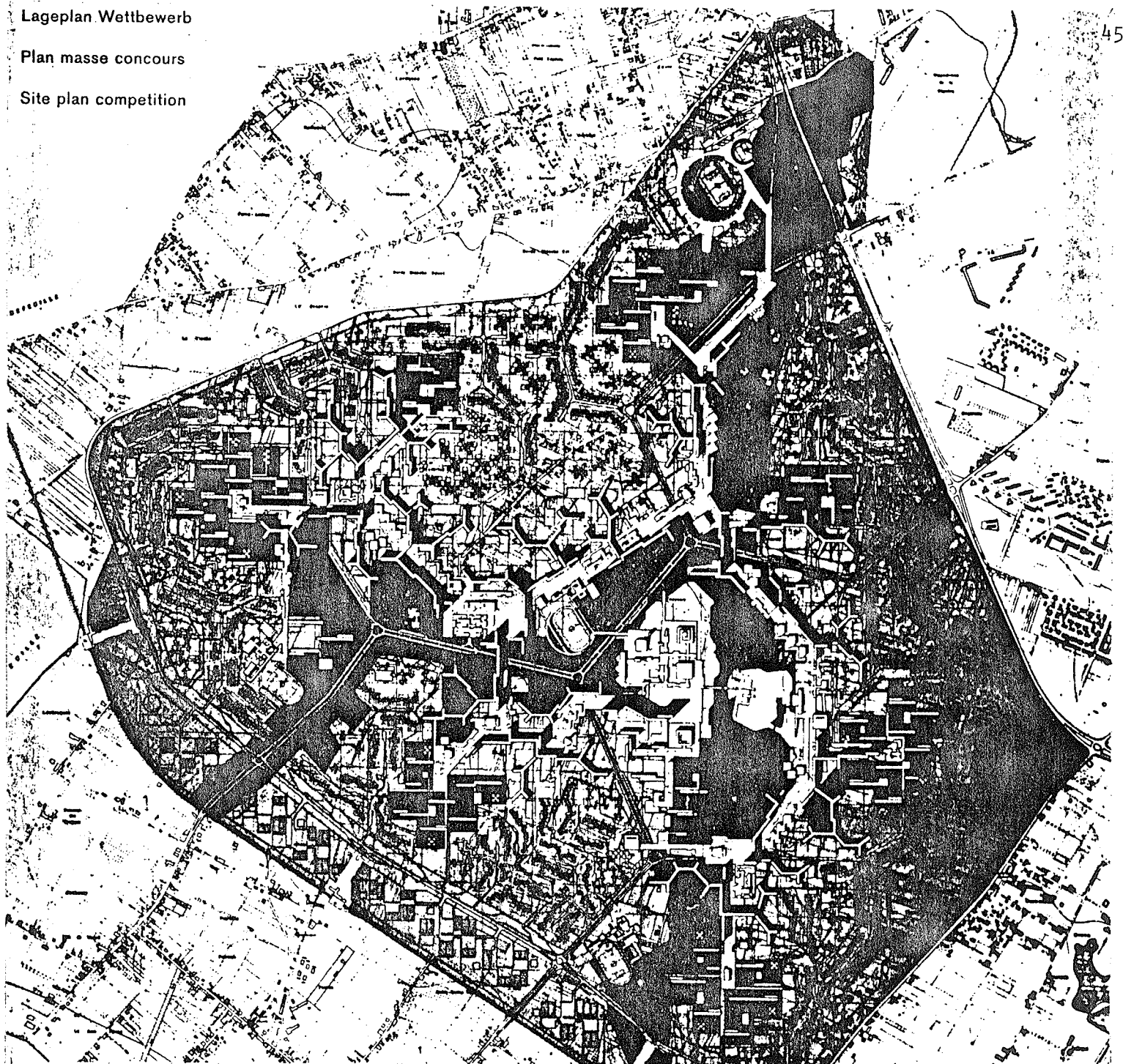


Fig. 17
Toulouse
Le Mirail

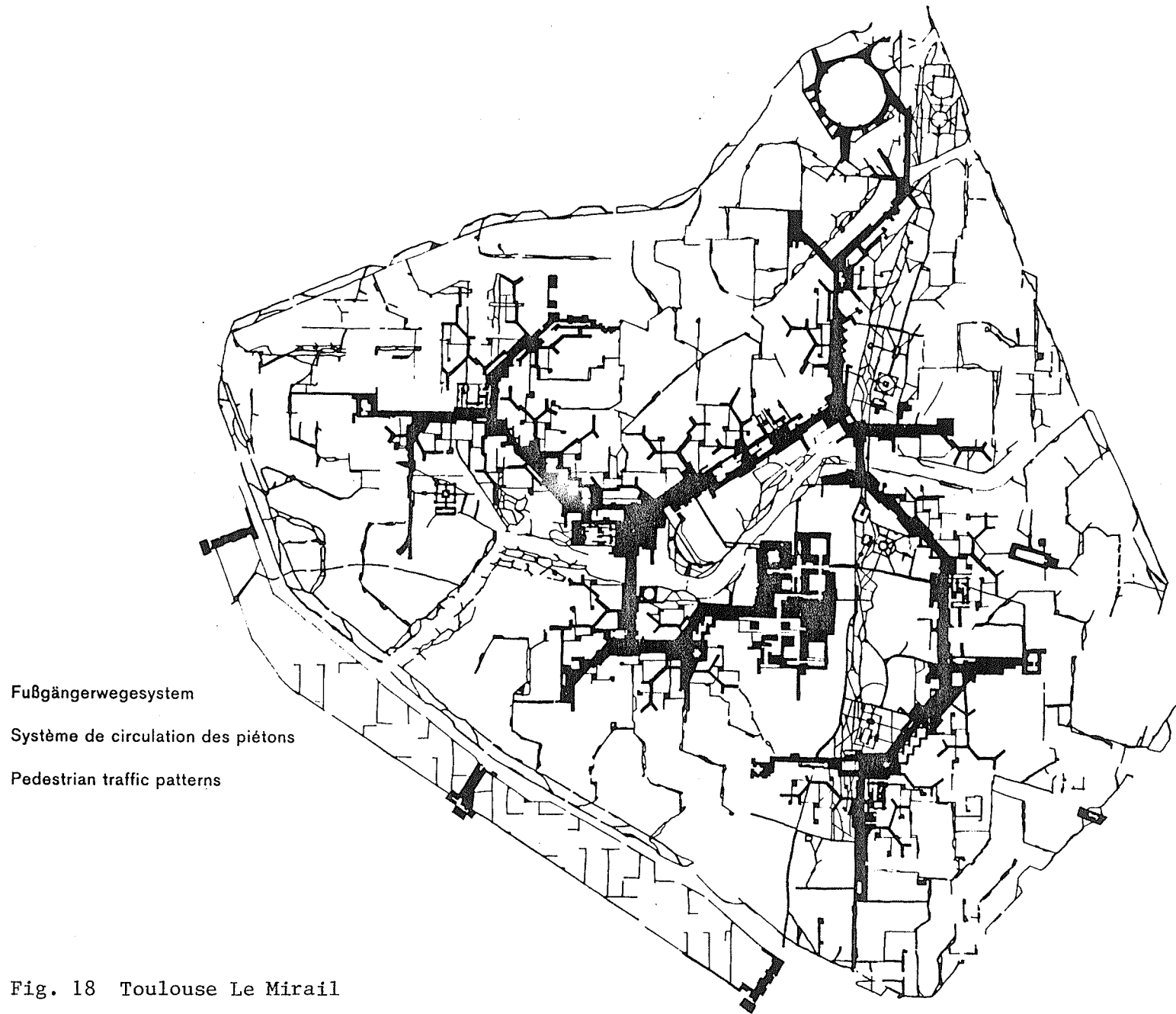


Fig. 18 Toulouse Le Mirail

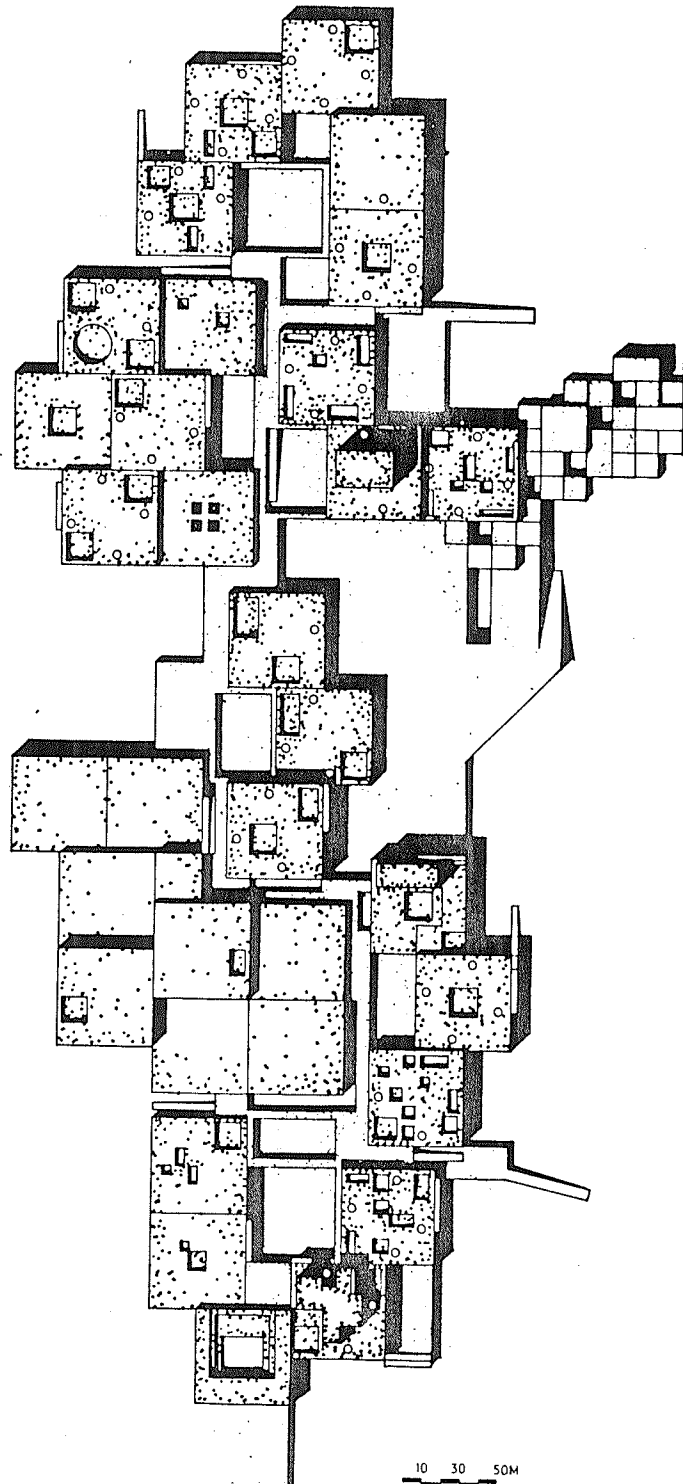


Fig. 19 Regional
Town Centre



Fig. 20 University

In addition to the centres provided along the Linear streets, an area of 25 hectares was designated 'Regional Centre' to serve a regional population of 3-4 million inhabitants. Since the exact nature of the requirements was unknown in the early design stages a plain 50 by 50 metre modular system was proposed, linked on the interior by a pedestrian network and on the outside by the automobile network. A very significant contribution to the ideal of the urban 'carpet' concept was the university built at Toulouse Le Mirail. Essentially it is a container that can be transformed as conditions dictate. Organized in a modular system, the university structure is adaptable and permits modern university life to occur unhindered. The physical form relates to the larger system of the town and is an appendage to the linear street.

The thesis appendix contains more detailed aspects of the plan but from the preceding discussion it should be clear that Toulouse le Mirail has much to offer to urban revitalization or new town construction. It clearly demonstrates a structure which in turn is composed of elements that do not contradict or harm each other. The separation of pedestrian and automobile is of paramount importance and it can be projected that the introduction of an elevated transit system would still be compatible

with the overall structure. The continuous green system in relation to the movement network and the location of main activity generators (centres along this network), strengthens the overall cohesiveness. As well, the adaptable building systems ensure that changing requirements will not make the entire concept obsolete.

AMSTERDAM, NETHERLANDS
PROJECT STUDY FOR PAMPUS 1965
Van den Broeken Bakema:

Combining the traditional relationship of residential development to polder landscape with the requirements of an expanding modern urban population, this project was proposed as an extension to an existing centre in a regional (national) framework of urbanization. The architects have rejected the notion of concentric expansion and are committed to a linear expansion--that is, a harmonious connection between 'moving' and 'staying'.

The major principles of the project are:

1. to provide a town for people to live and work

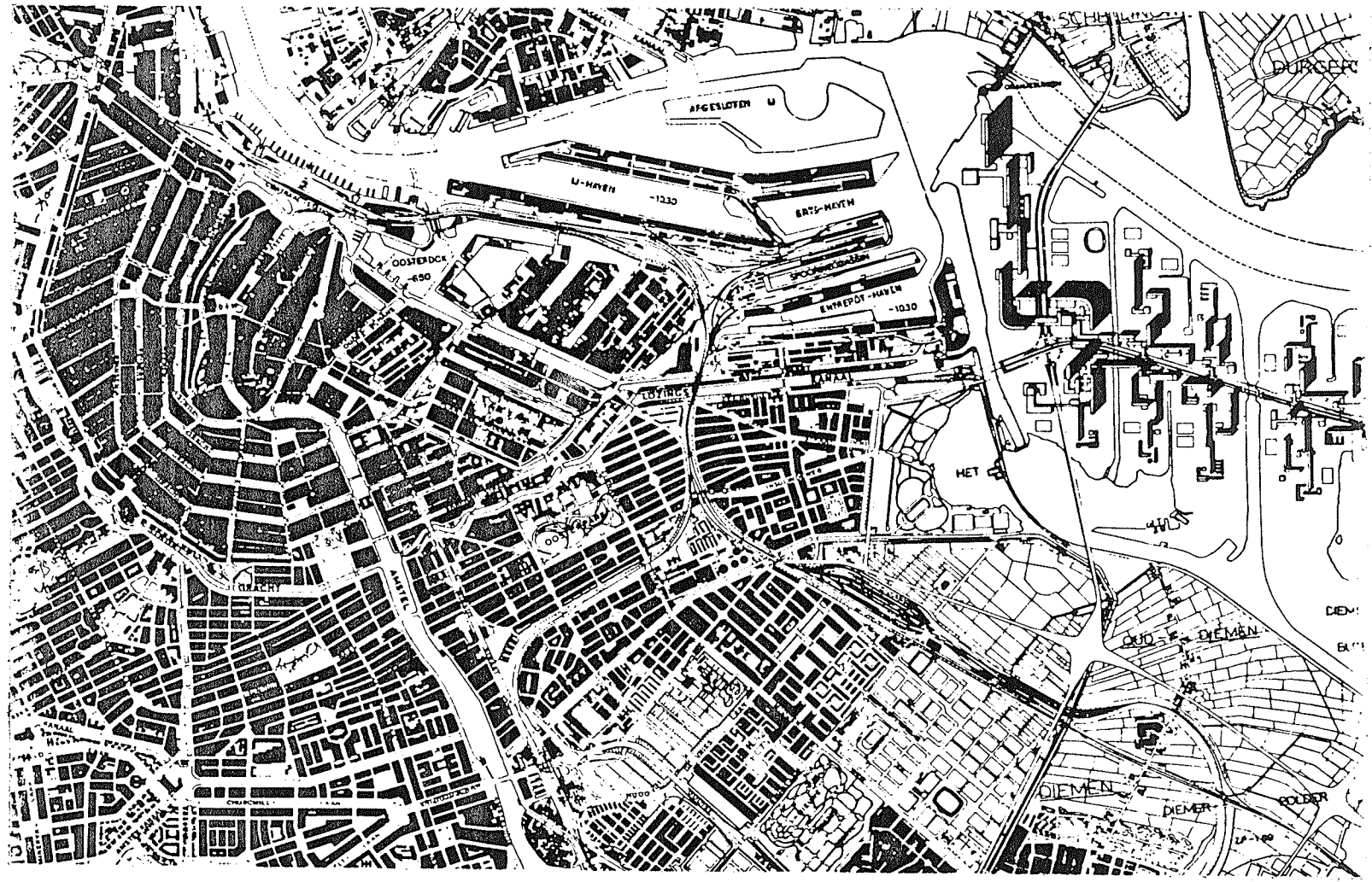


Fig. 21 Pampus Project Study

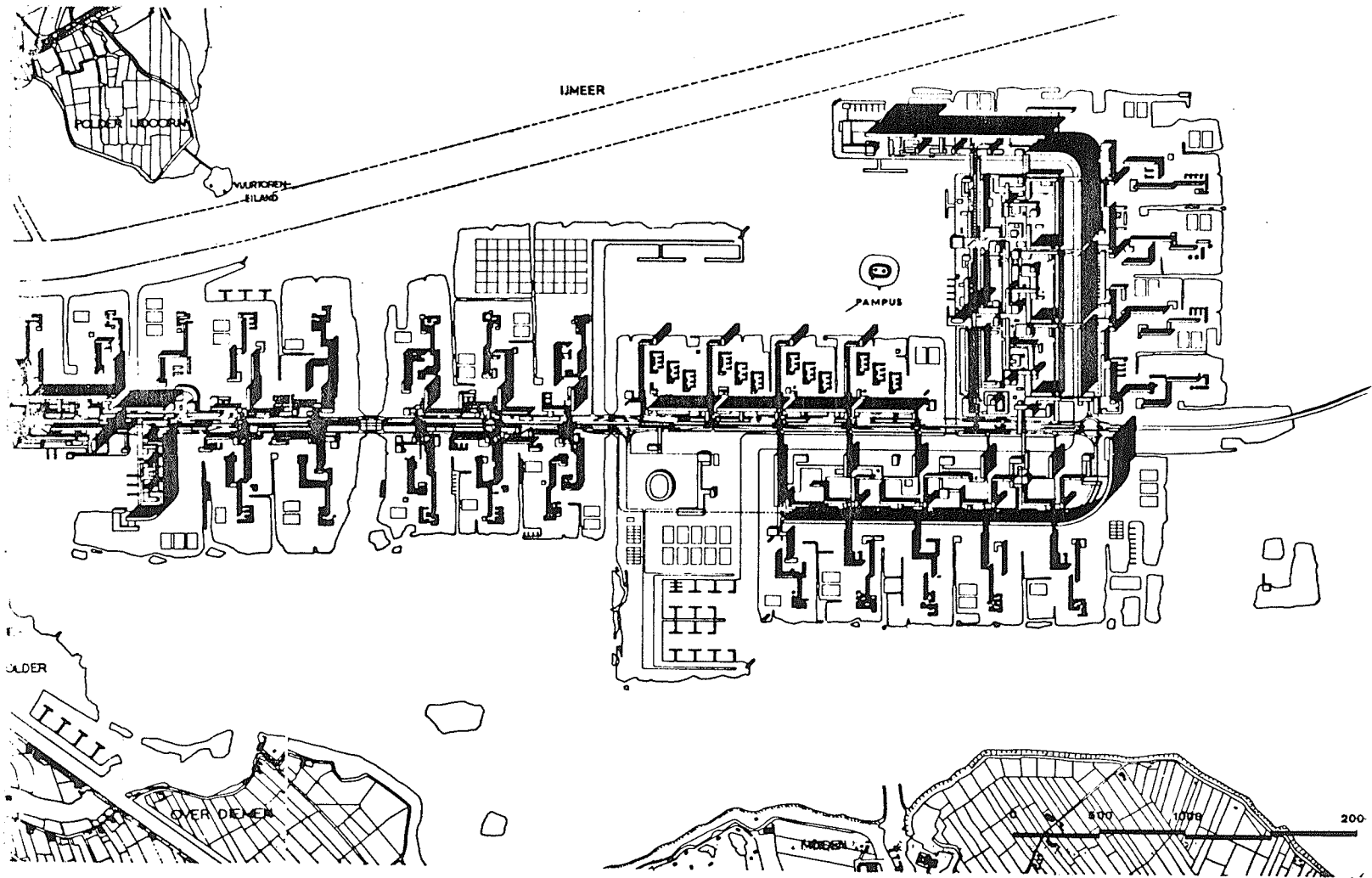


Fig. 22 Continuation of fig. 21

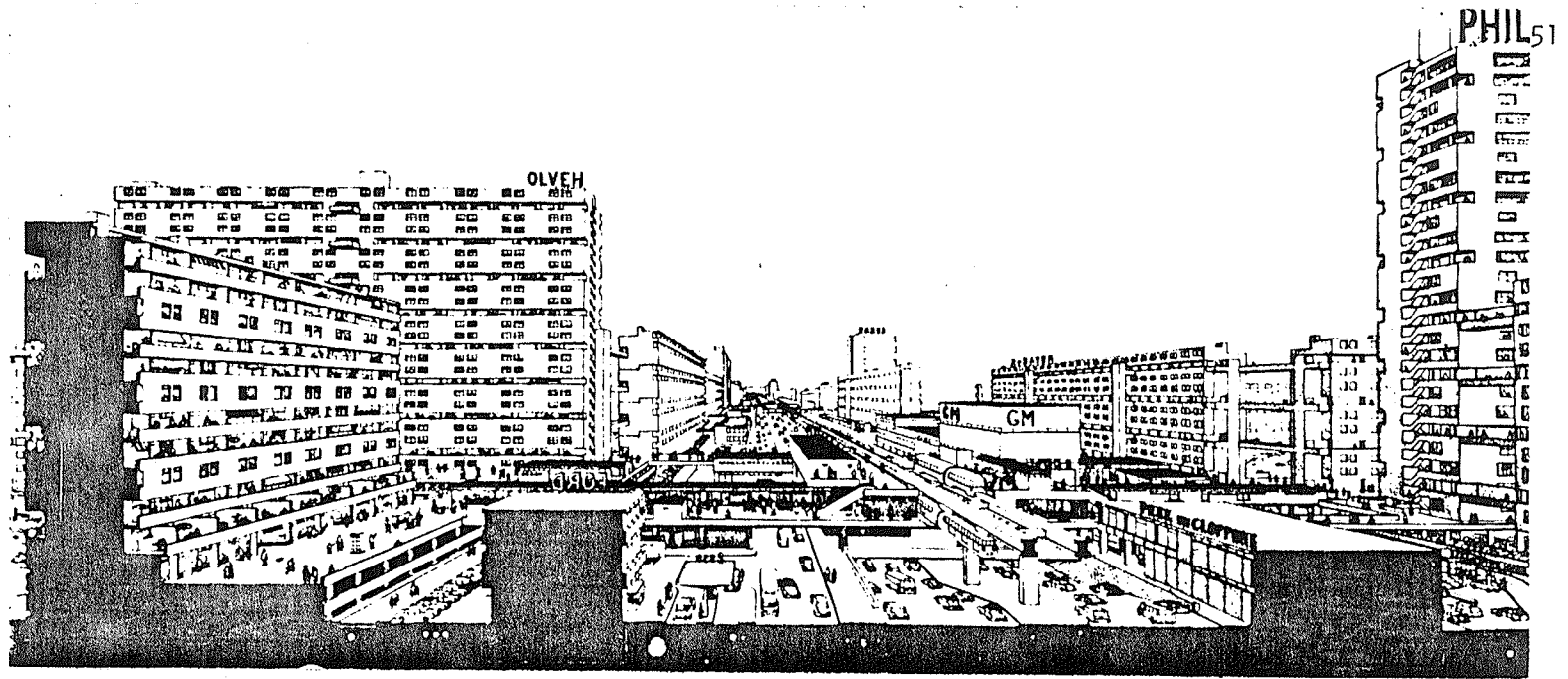


Fig. 23 Pampus

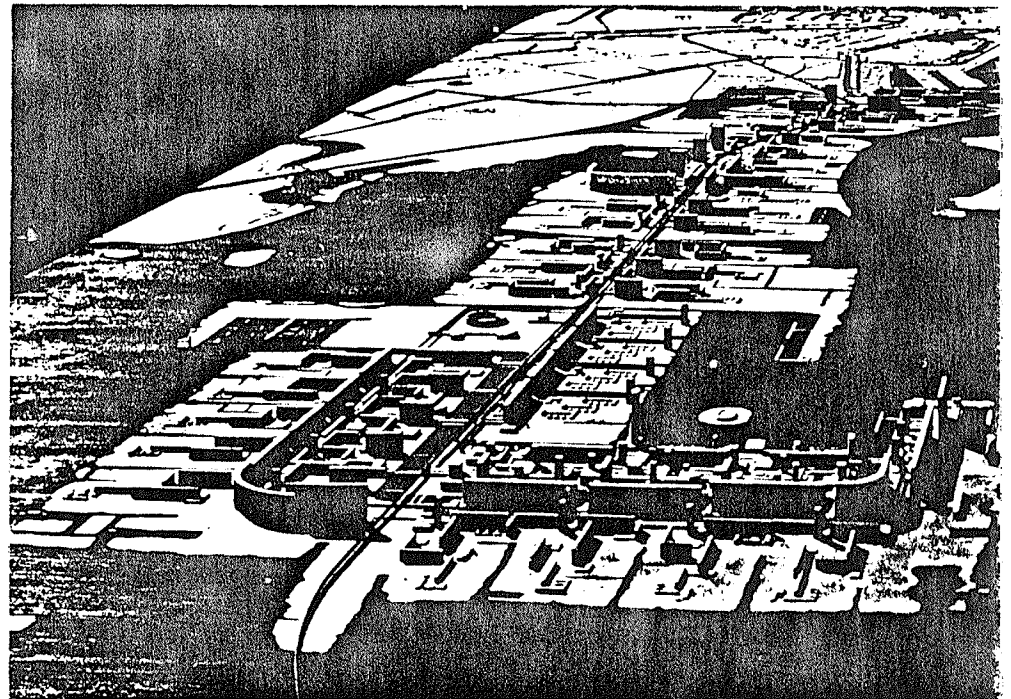


Fig. 24
Pampus

2. to provide the town structure in the middle of the countryside, thus facilitating access to recreation areas (including water as in Pampus)

Structurally, the major element is the main throughfare that permits private and public transportation. Offices and shops are located along this spine that travels the entire length of the development. The housing located along this centre is in the form of large apartment buildings, and institutions are also included to serve the inhabitants. Some low-rise forms of housing are provided just outside the main 'core-wall' buildings.

Bakema's ideas of the residential structure as a framework or 'vertebral' building are apparent in his Pampus proposal. While the buildings may appear to be complete mega-structures, they are actually prepared to the point at which the dweller may begin to participate and complete his own 'home'. Bakema's planning projects usually stress the importance of inhabitant participation in the planning and construction stages. His ideals are consistent with his desire to improve the communication systems employed by architects and planners so that the dweller is not handicapped by his lack of access to design 'tools'.

TACHAI NEW TOWN, CHINA:

This innovative village, built in the face of nearly insurmountable difficulties, reveals some key principles of integrated urban - rural development that will become increasingly important in this country as agricultural land is depleted by urban and suburban sprawl. The balance between agriculture and industry is a national economic goal in China and was adhered to in the development of Tachai so that agriculture would not be neglected, creating food shortages.

Tachai is a very influential model that is studied and copied throughout China and serves also as a model for the self-sufficiency that this thesis projects. Its importance is twofold:

1. within the structural context of the nation it is a model of independent organization and has transformed the rural economy and community,
2. it indicates completely new methods of approaching the reality and life of the inhabitants. Tachai's universal relevancy is to the settlement problem in terms of regional planning, town organization, architecture, and engineering. It

must be emphasized that Tachai is a successful model in the manner that it resolves the relationship between local and national programs. It follows the general plan for resource utilization in the entire nation (systematic, rational, controlled). It is entirely compatible with the individualized local programs of agricultural and resource development.

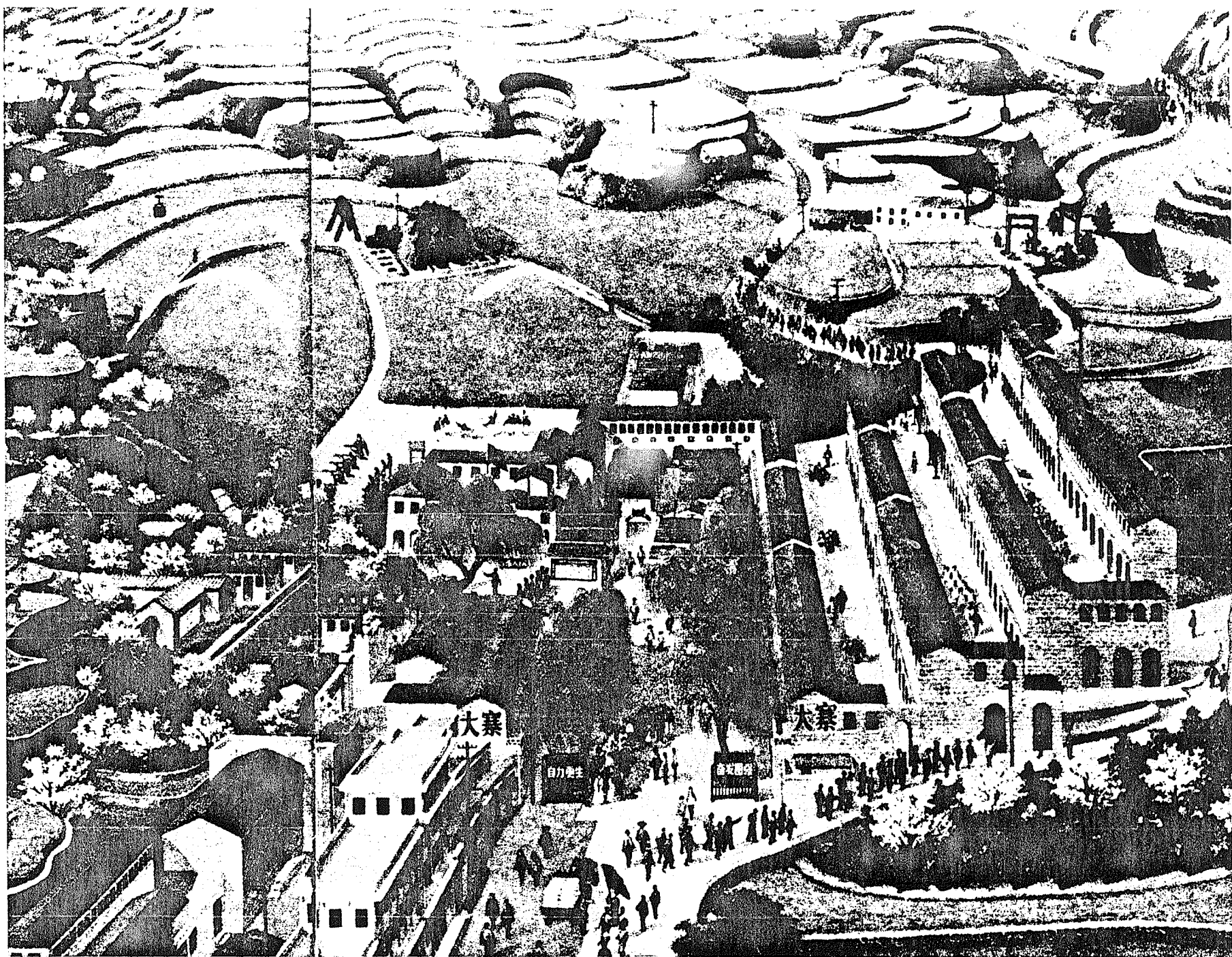
The flooding of 1963 in the Tachai area destroyed most of the fields and traditional cave dwellings. The Agricultural Production Co-operative and the 'Brigade' (village administration) held a series of meetings and debates and voted to pursue a reconstruction program that emphasized field reclamation (5 years) followed by village rebuilding (10 years). All work was largely completed by 1967. When the operational decisions were made in 1963, the local population also decided to achieve their goals through a self-help program (without State aid) but clearly within national development guidelines. Innovation, experimentation and progressive development formed key goals in their program.

The terracing of the fields combined agriculture and technology to achieve:

1. fertile fields on steep land,
2. conversion of hills into flat areas,
3. conversion of temporary fields into permanent ones.

The resulting land retains water, soil and manure and is very fertile. To avoid further flooding, canals were constructed, along with an underground tunnel to divert water away from the village.

The village itself is an important component of the overall composition, harmoniously combining buildings with nature. The major residential buildings are linear and arranged in terraces up the slope. The linear open spaces serve as the street, threshing floor, square, community courtyard--effectively separating private and public functions but still serving as important elements of communal cohesion. Traditional construction methods and local materials are utilized to construct all the buildings and effectively maintain an historical continuity. The linearity of the buildings is derived from the terraced agricultural land and is united with it in a harmonious whole.



The village also contains facilities for production (light industry), public utility, repair workshops, agricultural support, a social and cultural complex, a commercial centre and a stock farm (on the edge of the village). In the 1970s, infrastructural improvements were made to roads and services.

CONCLUSIONS

This chapter has presented a brief and selective historical review of how other countries and cities have tried to come to grips with the problems of rapid urban development since the Second World War. The main points that emerge are:

1. The urban growth of England, France, the Netherlands, Sweden and Denmark was considered a national concern and was to fit national policies-- policies that were political and economic. Economic policy (including industrial and agricultural strategies) was the determinant of the urban policies. Individual cities did not have to rely on narrow self-interest to guide them in their new programs.
2. Regional planning received prominence. The regional plans were tailored to fit within national policies and were not to be counterproductive to the economic goals of the country as a whole.
3. Local planning of individual cities and new towns was to reflect and serve as the implementation tool for the larger policy formulations. Again, consistency was required so that the new towns provided the employment and housing called for in the national and regional plans.

The new town plans were not entirely successful and many have structural shortcomings that create as many problems as they solve. Their successes and failures, however, have provided the author with an understanding of the scope of urban problems. Canada lacks strong national industrial and urban policies. Few regional plans have been prepared that treat a group of cities and towns as an entity that must co-operate to utilize resources effectively. The prototype proposed in the next chapter is local in its scope but regional and national in its location in the industrial 'plan'. The lessons learned in chapters two and three ensure that 'self-supporting' will not be synonymous with isolation and entrenchment.

The Chinese example, Tachai, approaches the difficult contradiction that usually arises when self-sufficiency is discussed or proposed: the problem of resolving self-sufficiency within the larger goals of the region and the nation. Decentralization and localism can co-exist with an infrastructure of economic and social realities that are regional and national. It is within this context that chapter four presents a viable solution to the urban problems identified in the first chapter.

CHAPTER FOUR
PROTOTYPE DESIGN

The author has presented, in the first three chapters, the background or the prerequisites for understanding where we have been and where we could possibly go. He now proposes a 'prototype' that seeks to incorporate the lessons learned from old towns and from attempts by the author's contemporaries to deal with urban problems. The author's prototype does not attempt to 'reinvent the wheel' but utilizes valuable lessons learned by historic town-builders and contemporary new town planners--lessons such as the importance of good public transit, concentrated urban facilities, and non-wasteful land utilization. (See appendices for specific examples.)

GOALS OF PROPOSED URBAN STRUCTURE

- 1) The environment must include all the needs basic for the support of human existence without over-emphasizing one aspect at the expense of others.
- 2) This balancing of diversified needs is nurtured in an environment that relies strongly on cooperation and the sharing of facilities.
- 3) Self-sufficiency should not be achieved in one locality or region to the detriment of other locali-

ties. Inter-regional cooperation is also necessary for balanced self-sufficiency.

- 4) Fulfillment of the needs of the community should not be imposed. That is, each individual must feel that his contribution is required or necessary but not demanded. Access to information and educational networks are most important in providing all community members with a shared consciousness.
- 5) A social structure must be provided that is receptive to alternative organizational forms of community life. The physical structure can be altered to reflect these social forms.
- 6) The community's goals for a non-wasteful and environmentally-benign life style must be reflected in the physical pattern.
- 7) The prototype must incorporate in its physical patterning:
 - a) non-wasteful land use patterns
 - b) non-polluting urban and rural development
 - c) highly integrated and diversified uses

- d) all compatible uses provided within a framework that permits mobility
- e) a physical framework that is essentially a 'support' system to encourage change and transformation as required by the community's changing needs.

ENERGY

While politicians and the citizenry argue over the price of fossil fuels, the rationale for their use is not seriously challenged. Homes, offices, factories, are still largely heated and cooled by fossil fuels. Although a few prototypical solar heated homes and buildings have been constructed, the larger issues are not challenged. The distribution of urban uses over a wide area is a major contributor in the misuse of energy. In each application of the author's prototype, energy is conserved by the compactness of the overall form which reduces the need for energy as well.

Essentially, the prototype is a model of energy efficiency achieved through several design features:

- 1) Access into and out of the site is via (electric) public transit. The combustion of gasoline occurs only in trucks that service the structure and in emergency vehicles. Private automobiles are not driven into the site but remain peripheral.
- 2) Heat producing industries such as recycling plants are located so that waste heat is 'borrowed' for residential use. If an industry uses hot water for some process, then the waste water can be utilized for the heating of other spaces when the industrial use is completed.
- 3) All residential structures are solar oriented. The east-west linearity of the main 'street' facilitates the location of residential units so that glazed facades are oriented to the south as is each unit's outdoor space. Passive solar energy is the primary heat source, supplemented by heat pumps (exchangers) and renewable (electrical) heat sources.
- 4) The compactness of the overall site allows most activity areas to be reached on foot or bicycle. Handicapped persons are transported via electric carts.

- 5) The architecture of the overall structure is climatically determined--north facades are blank and enclose service areas. High-rise towers are avoided to reduce the effect of cold winter winds on windward facades and the summer's heat on southern facades.

DESIGN FEATURES THAT STRENGTHEN SELF-SUFFICIENCY

It is the author's intention that the prototype must avoid proposing a cloistered and self-centered ghetto in the larger urban region. A high degree of self-sufficiency is required and is facilitated by the prototype design.

- 1) Employment opportunities in areas of food production, education, manufacturing and recycling--as well as in shops and workshops--are provided along the main 'street' and to a lesser degree in the neighborhood connectors themselves.
- 2) Each dwelling unit contains an outdoor deck that is partially a growing area. All southern facades are solar greenhouses, thus allowing vegetable growth year round.

- 3) Larger agricultural areas are provided in close proximity to the residential units. Some are in the form of allotment gardens situated near the recreation areas while other agricultural production occurs in larger community gardens that are supplanted by solar greenhouses for year round production. The importation of food is therefore greatly reduced.

- 4) As discussed, most energy sources--solar, wind and biotherm--are on the site itself, thus reducing the dependence on imported fossil fuels.

- 5) A wide variety of educational opportunities enhances and expands the urban experience. The population may participate in industry or agriculture to learn diversified skills rather than be dependent on one narrow specialty.

- 6) Within walking distance from dwelling and work place are located large recreation areas integrated with the agricultural areas. Those sites located adjacent to bodies of water also offer rowing and sailing in addition to participation-oriented land activities. The inhabitants are not forced to commute long distances in the evenings or weekends for leisure and sports.

- 7) The architecture of the structures is such that the user can participate at an early stage (design and construction). A 'framework' approach enables those who so desire to participate directly in affecting the shape and accoutrements of their shop and dwelling.

- 4) Subsidize users who are unable to afford higher rents by taxing more profitable users. Thus, craftsmen's stalls could be located in prominent areas instead of in less accessible locations.
- 5) Enhance accessibility. Workshops and dwelling units in close proximity to each other and to other urban facilities permit mobility among functions and a more direct participation in the action.

THE INTEGRATION OF DIVERSIFIED ELEMENTS

As discussed in the previous section, the key elements of self-sufficiency are essentially few in number. A very important principle is that the self-supporting urban structure retain a lively activity pattern that avoids the sterility of most 'planned' new towns. It is therefore proposed that a highly diversified accommodation pattern be instituted from the inception. This accommodation pattern would:

- 1) Permit a freedom of compatible uses to locate without hindrance of zoning.
- 2) Prevent large institutions from dominating large sections of 'street' facade.
- 3) Allocate locations to create day and night activity. Thus, entertainment uses may be located adjacent to financial and retail outlets.

PROTOTYPE URBAN STRUCTURE

The sketches that follow are various applications of the prototype design. Each application or site contains in varying degrees the main characteristics of the prototype:

- 1) a main central axis that is
- 2) surrounded by neighborhoods with
- 3) streets and private paths along which are located
- 4) occupational, residential, educational and service functions.

PEDESTRIAN SYSTEM:

The pedestrian system occurs on three main axes:

- 1) **Main axis:** A pedestrian deck located above the rapid transit and servicing level that is continuous and covered. Along this axis are located the major educational and commercial facilities as well as housing and work places. It is the axis that contains the highest intensity of uses.
- 2) **Neighborhood axes:** Each is perpendicular to the main axis and accommodates residential, neighborhood-level commercial and working places.
- 3) **Inner axes:** Each is a private axis that services housing units.

TRANSPORTATION SYSTEMS

The major transportation mode is the light rapid transit that is integral with the urban infrastructure itself. It is located along (under) the main pedestrian axis and serves industrial and commercial users as well. Traditional truck servicing occurs on a level below the main pedestrian

deck, but no other private vehicles are stored on site. Private automobiles cannot penetrate the site and are stored in peripheral garages. Electro-assist vehicles are used in the neighborhood and inner axes for the movement of goods and elderly or handicapped persons.

INDUSTRIAL AND AGRICULTURAL SYSTEMS

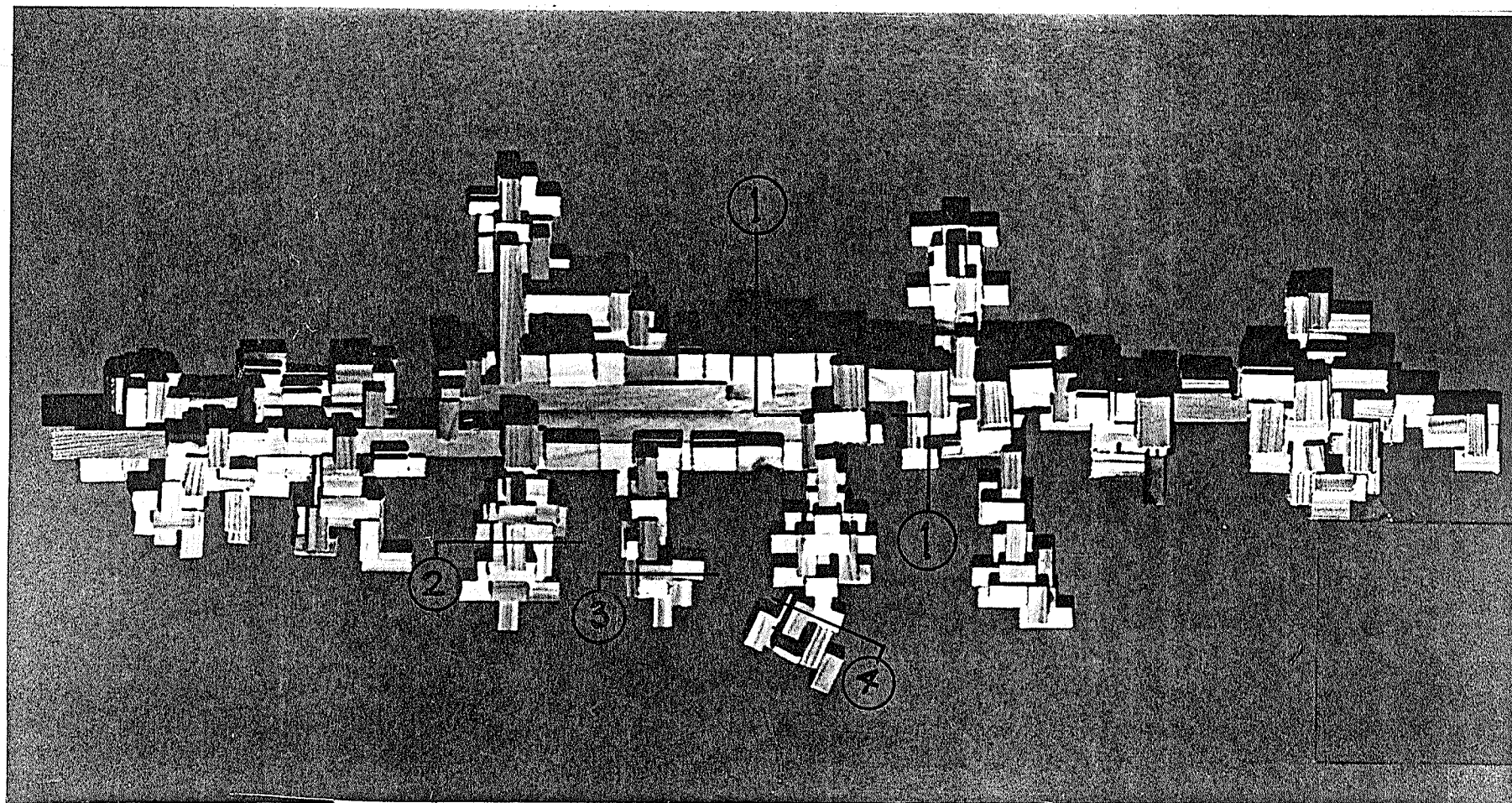
The industrial system is integrated into the urban infrastructure and is composed of:

- 1) Larger plants located on the periphery of the site (e.g. recycling industries).
- 2) Smaller plants located in the urban structure:
 - a) on the main axis--medium size manufacturing plants
 - b) small clean workshops on the neighborhood axes
 - c) individual workshops and galleries along the inner axes.

The important principle is that a great number of urban workplaces can be located in close proximity to other uses especially if they are designed with non-polluting criteria.

The agricultural system enforces the self-sufficiency and is another highly compatible use. Each dwelling unit has a growing area that is also a solar greenhouse for winter use. The use of hydroponic methods can expand the productive capacity. The entire site is served by allotment gardens (private use) and by larger intensively farmed areas that provide year round produce as well as employment. The processing of agricultural produce is another local industry and some exporting may occur.

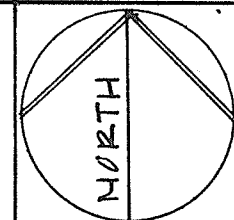
It should be remembered, when studying the sketches, that it is not the author's intentions to provide a 'complete' architectural model that would result in a deterministic solution. The sketches are indications and suggestions for a framework or infrastructure that is to serve as a vehicle for community cooperation in achieving a self-supporting urban life that provides one's physical and spiritual needs.

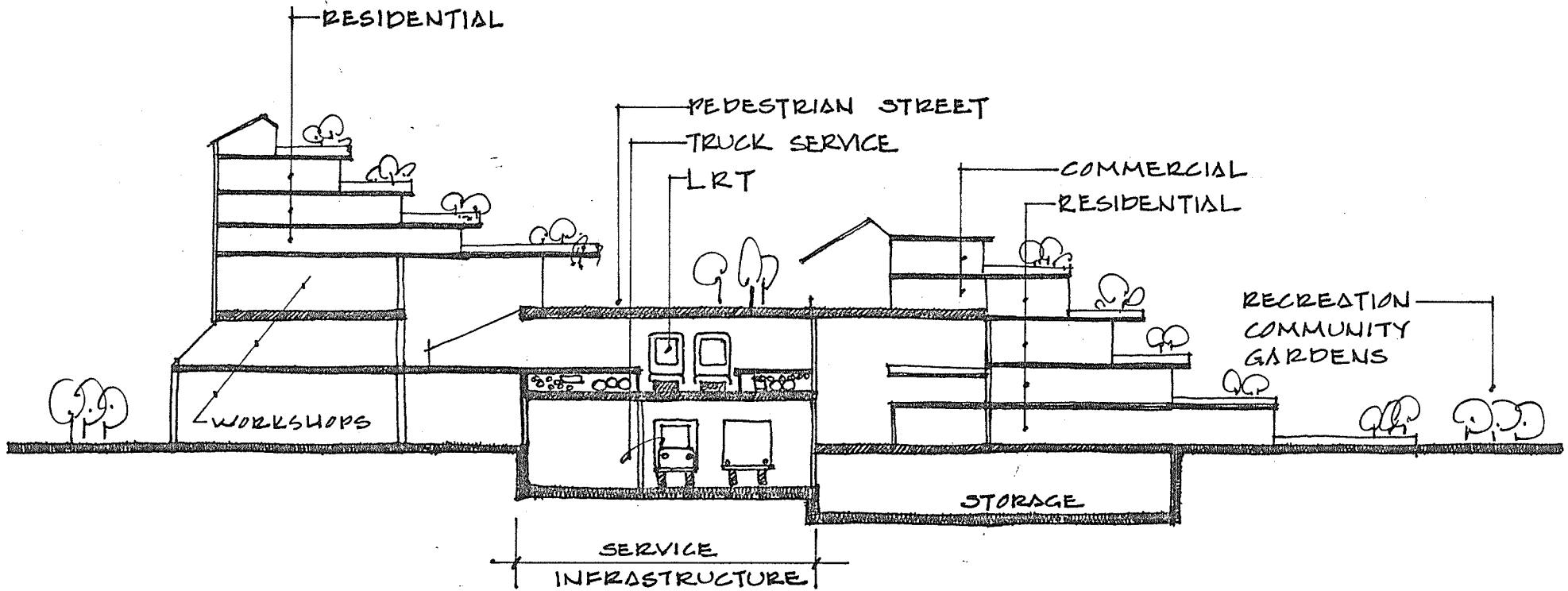


PROTOTYPE DESIGN
MODEL

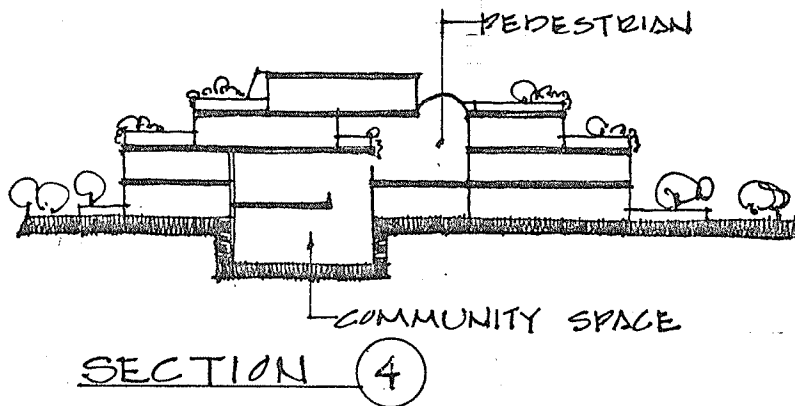
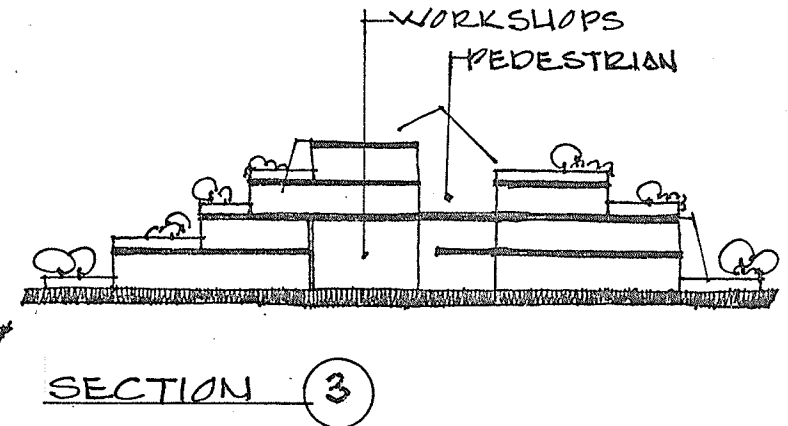
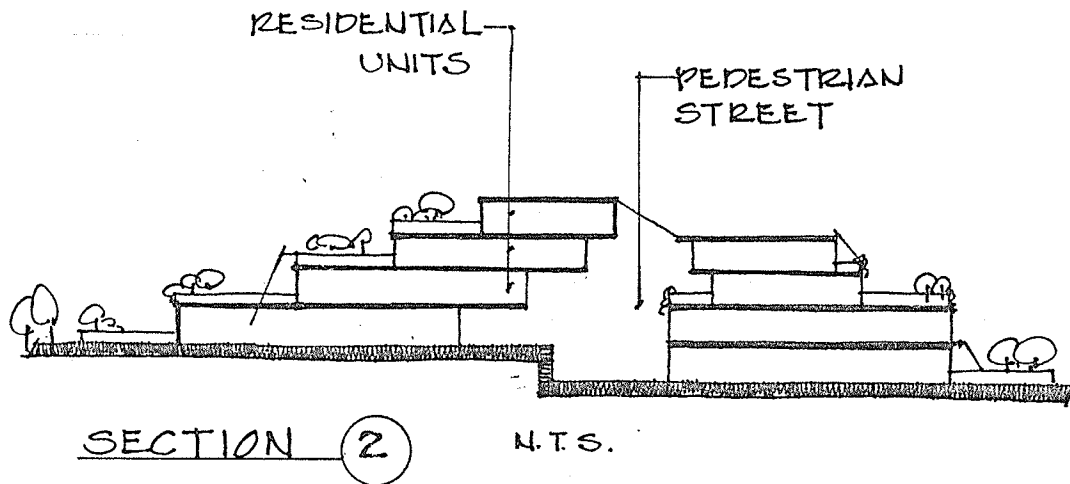
PLAN VIEW
OF MODEL

MODEL SCALE: 1:1000



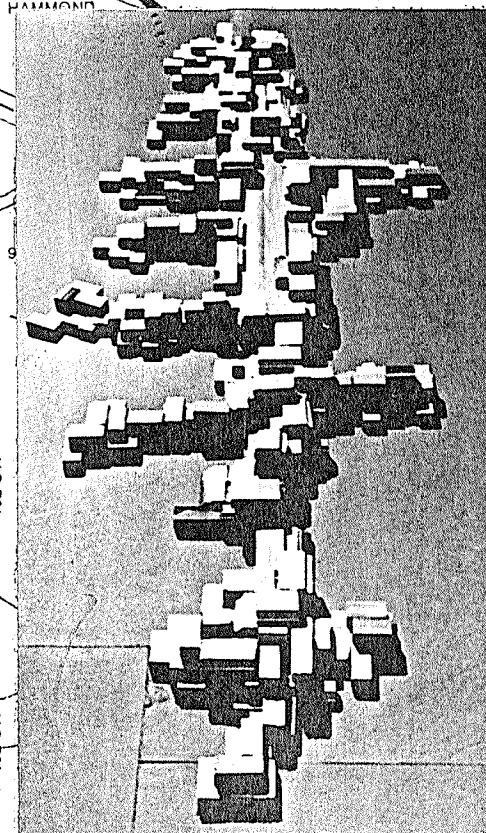
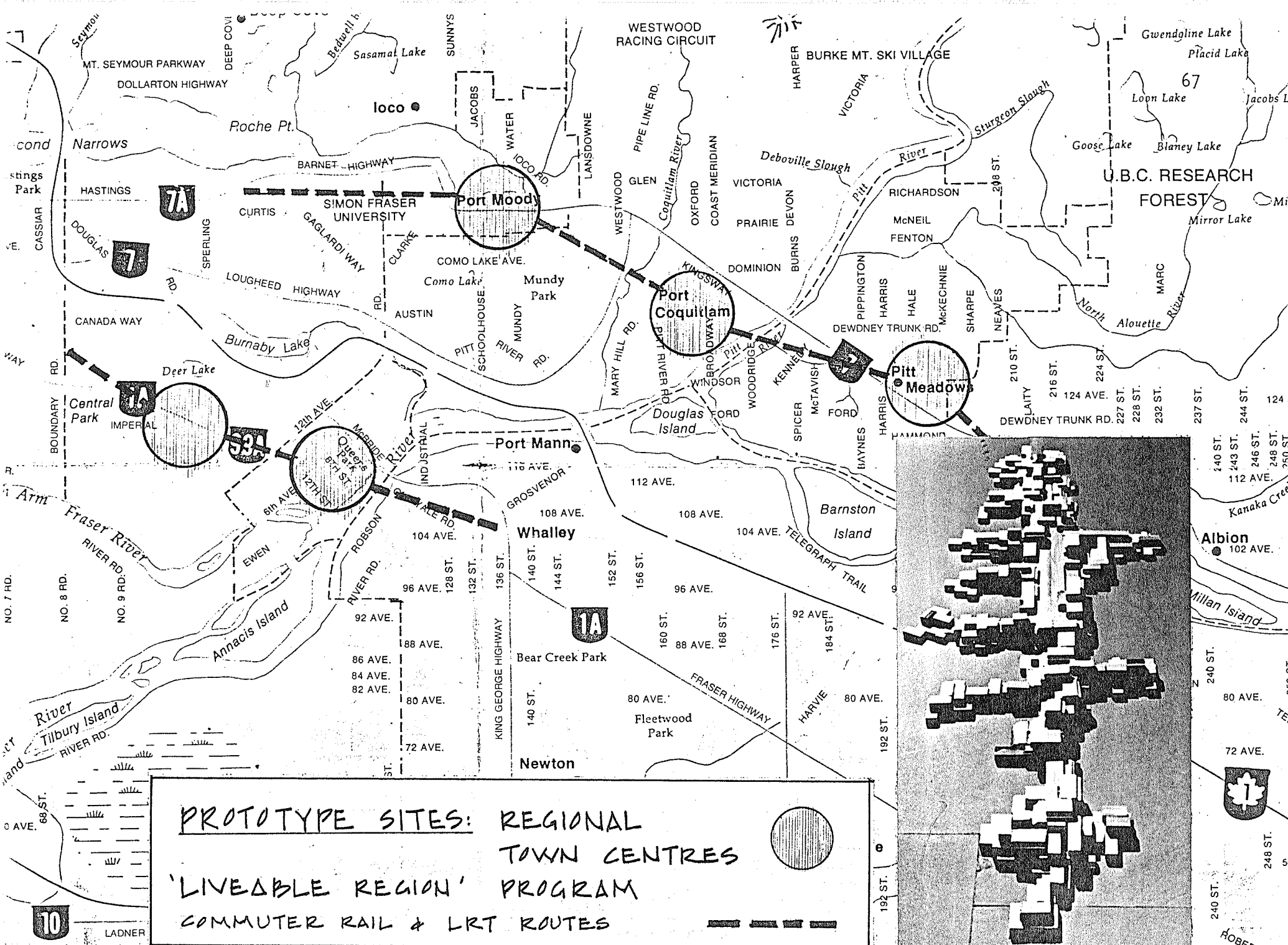


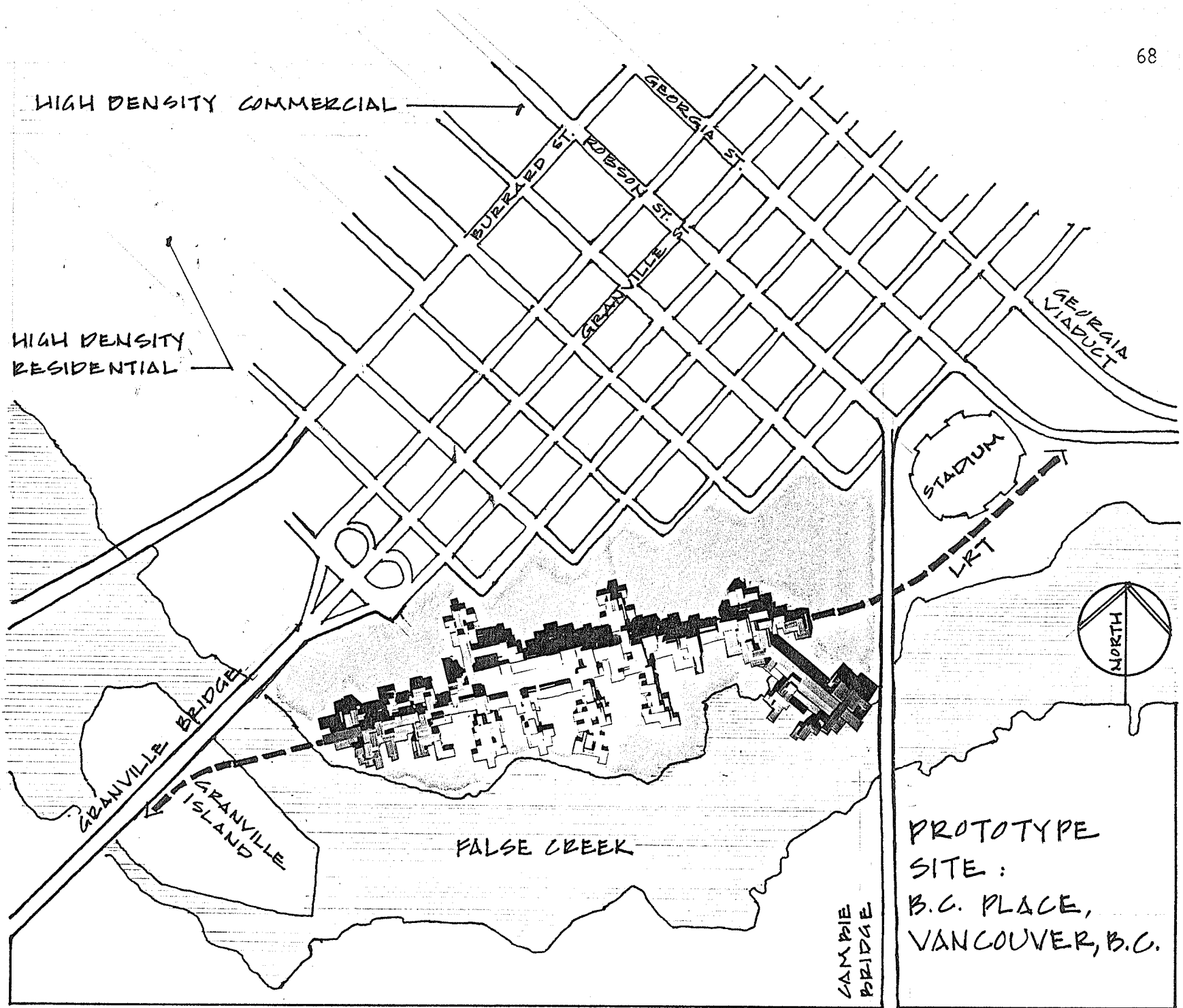
	<p>SECTION ① N.T.S.</p> <p>MAIN AXIS</p> <p>SERVICE INFRASTRUCTURE</p>
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NEIGHBORHOOD AXES

- NEIGHBORHOOD LEVEL COMMERCIAL, WORK PLACES, EDUCATIONAL, ENTERTAINMENT SPACES.
- RESIDENTIAL UNITS WITH DECKS AND GREENHOUSES.
- DIRECT AND EASY ACCESS TO ALLOTMENT GARDENS AND RECREATION AREAS.
- VARIETY OF HOUSING TYPES WITH USER PARTICIPATION IN DESIGN AND CONSTRUCTION.





HIGH DENSITY COMMERCIAL

HIGH DENSITY RESIDENTIAL

FALSE CREEK

STADIUM

LRT

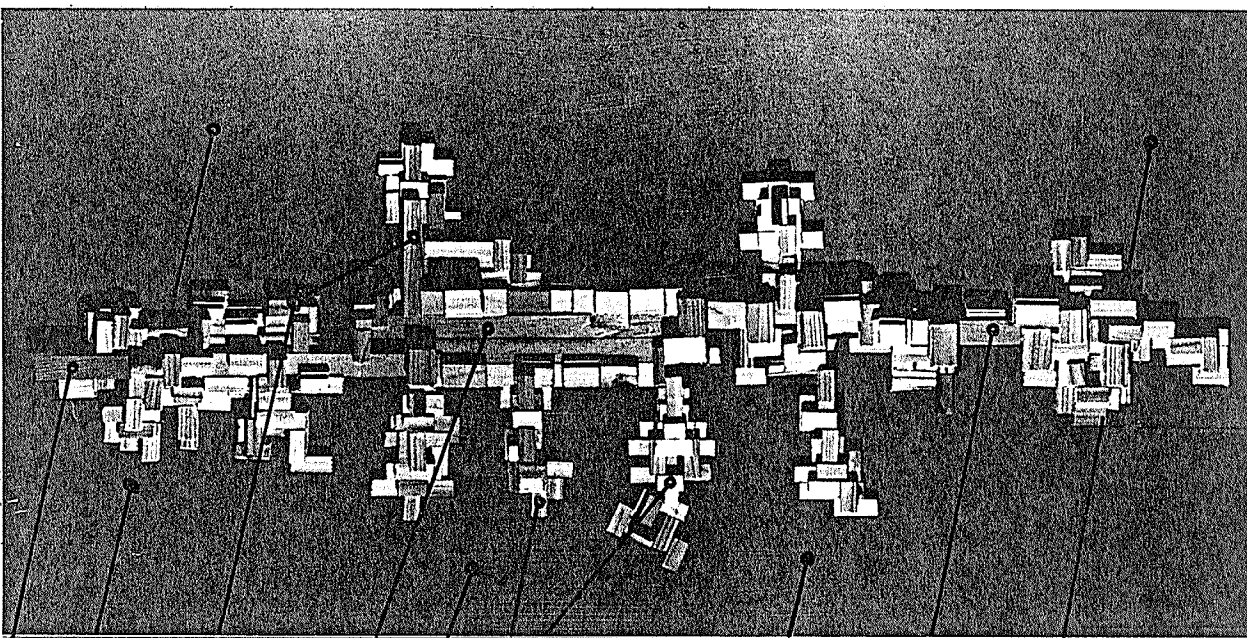
NORTH

PROTOTYPE SITE :
B.C. PLACE,
VANCOUVER, B.C.

CAMPIE BRIDGE

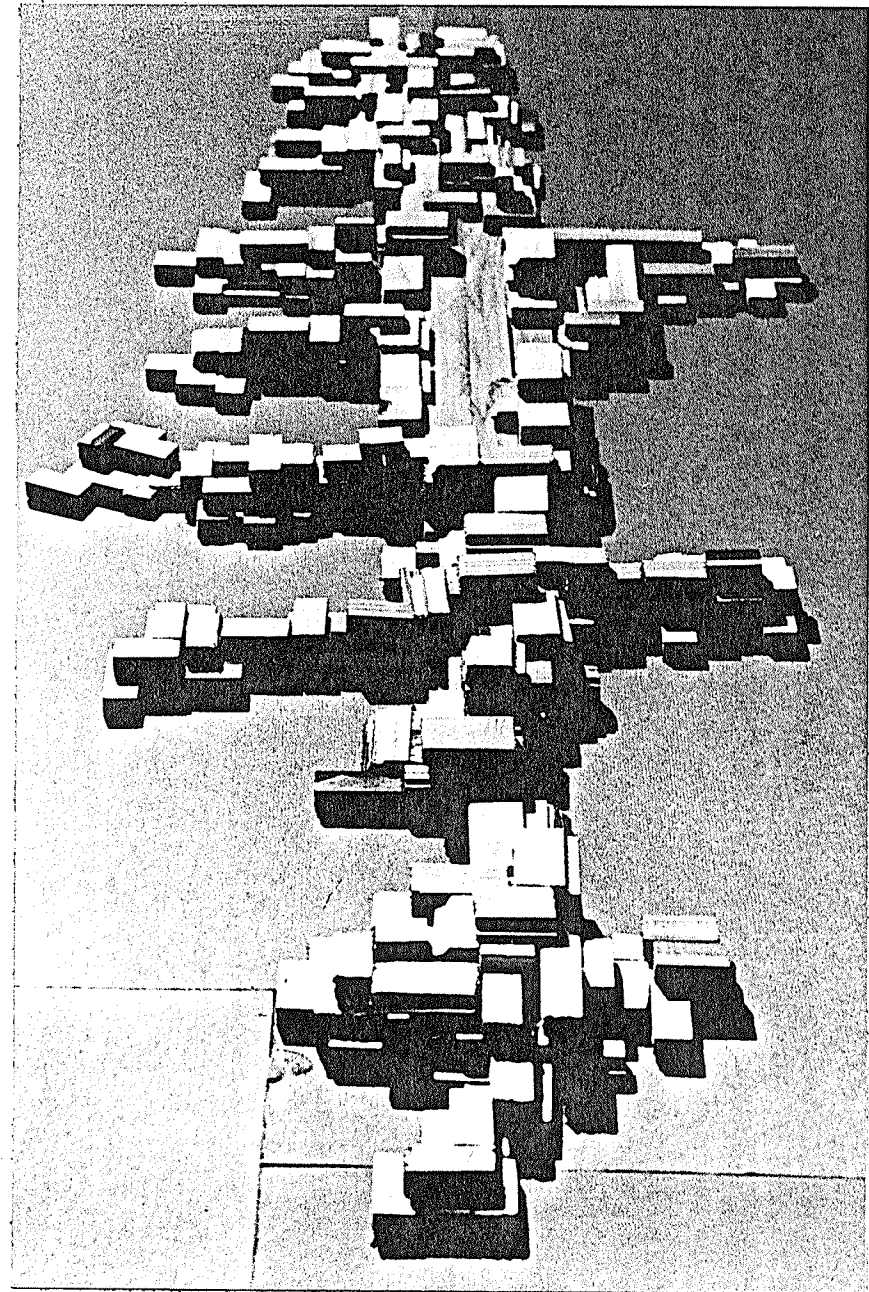
SITE UTILIZATION

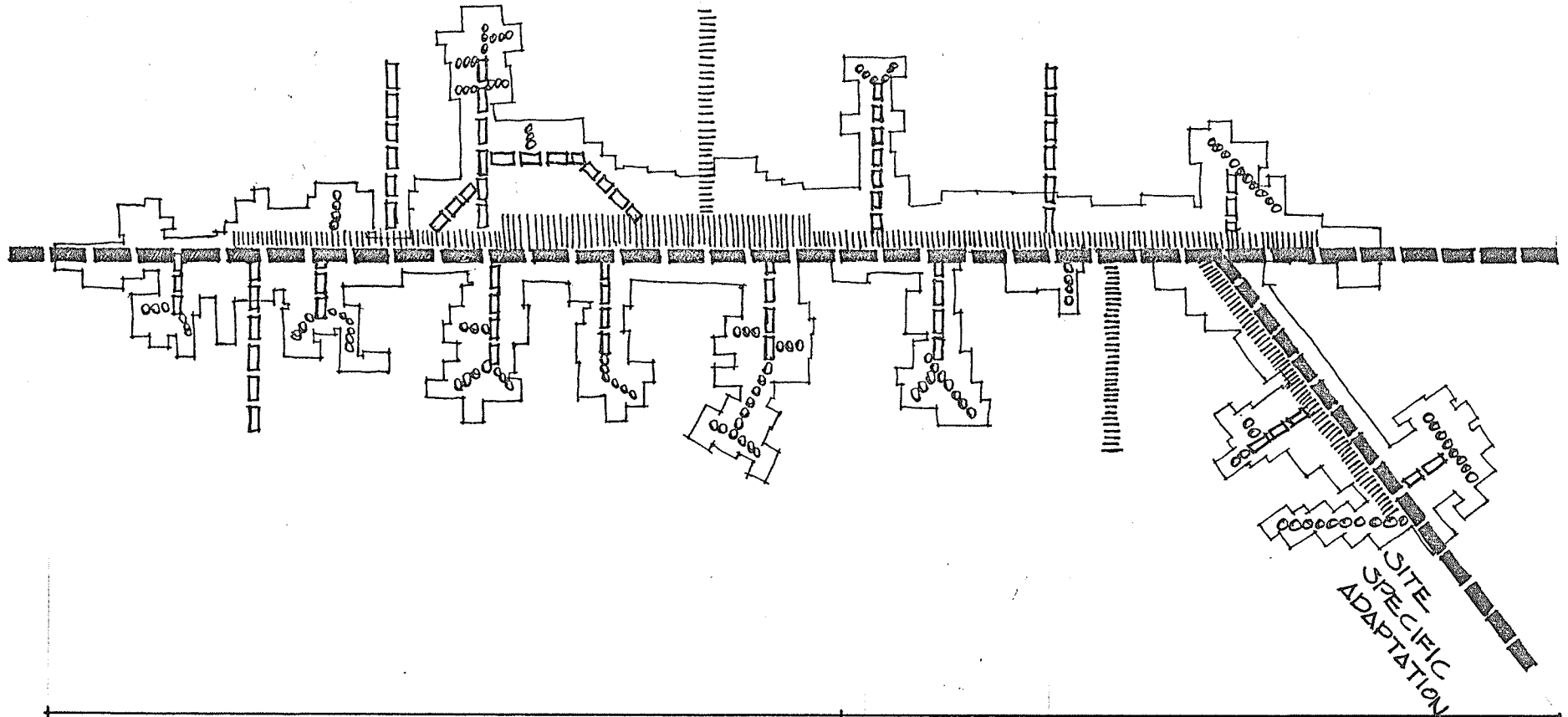
- LRT ROUTE
- ALLOTMENT / COM-MUNITY GARDENS
- WORKSHOPS / PROCESS
- STATION / MARKET
- RECREATION AREAS
- RESIDENTIAL - INNER AXES
- RECREATION AREAS
- LRT ROUTE
- ALLOTMENT / COM-MUNITY GARDENS



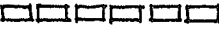



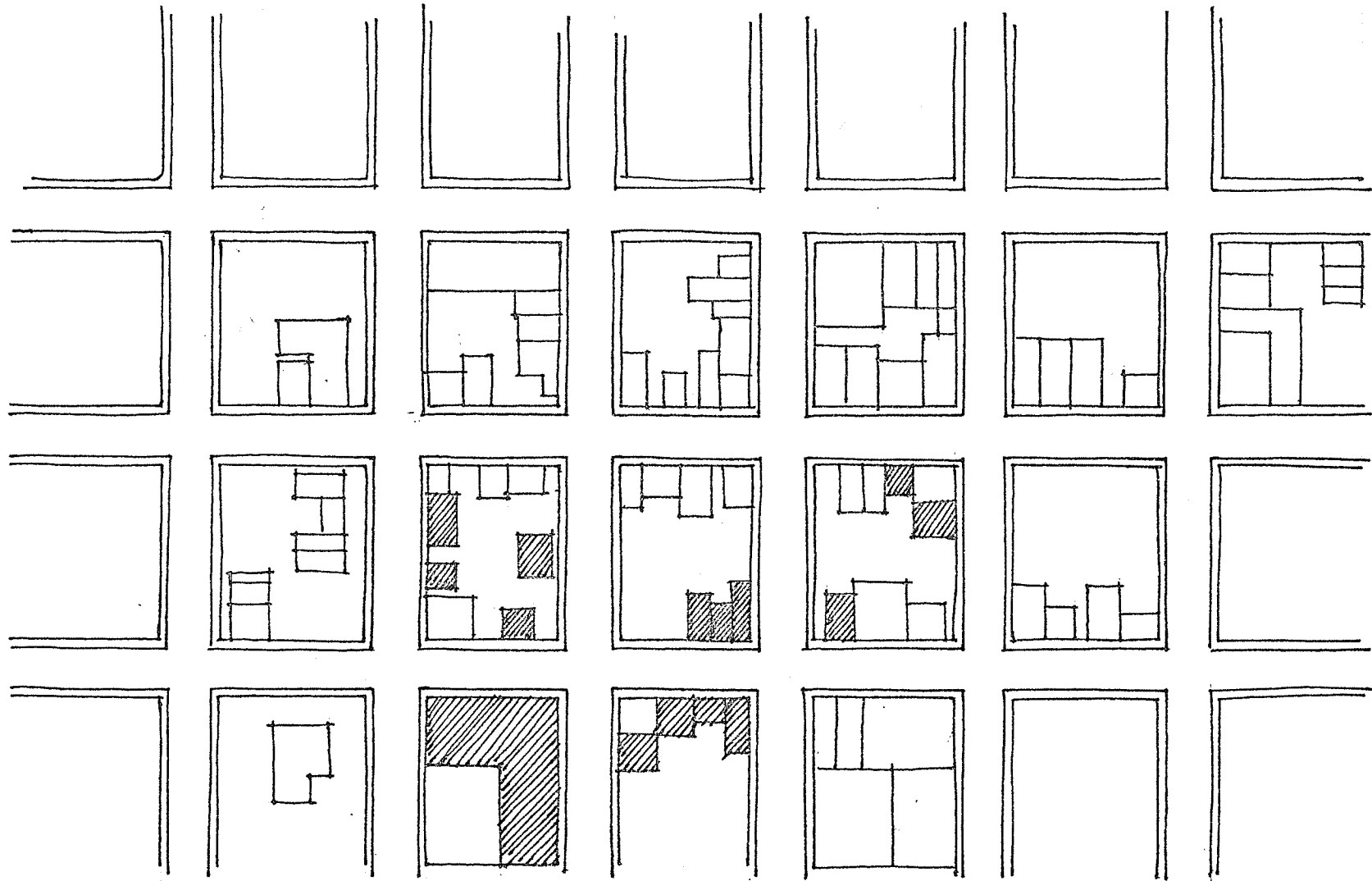
SELF-SUPPORTING URBAN STRUCTURE — A DIVERSIFIED- INTEGRATED MODEL



- AN ARCHITECTURE THAT IS A DIRECT RESPONSE TO A HIGH DEGREE OF URBAN SELF-RELIANCE.
- CONSTRUCTION SYSTEM BASED ON INFRASTRUCTURE AND INFILL.
- INDIVISIBILITY BETWEEN VARIOUS FUNCTIONS AND ACTIVITIES.
- EASILY MANAGEABLE SCALE, UNDERSTOOD BY ALL PARTICIPANTS.
- A HIGH DEGREE OF USER PARTICIPATION AT ALL STAGES.
- EASE OF CHANGE AND ADAPTATION — SITE AND CLIMATE.
- CONTINUOUSLY CONNECTED PATTERN OF BUILT AND OPEN SPACES.
- PROVISION FOR PRIVATE AND PUBLIC ACTIVITIES.
- NONWASTEFUL LAND USE INTEGRATING URBAN AND RURAL.
- HIGHLY DIVERSIFIED ACCOMMODATION PATTERN.
- ORGANIC TOTALITY WITHIN A SOCIAL AND ECOLOGICALLY COMPLEMENTARY INFRASTRUCTURE.



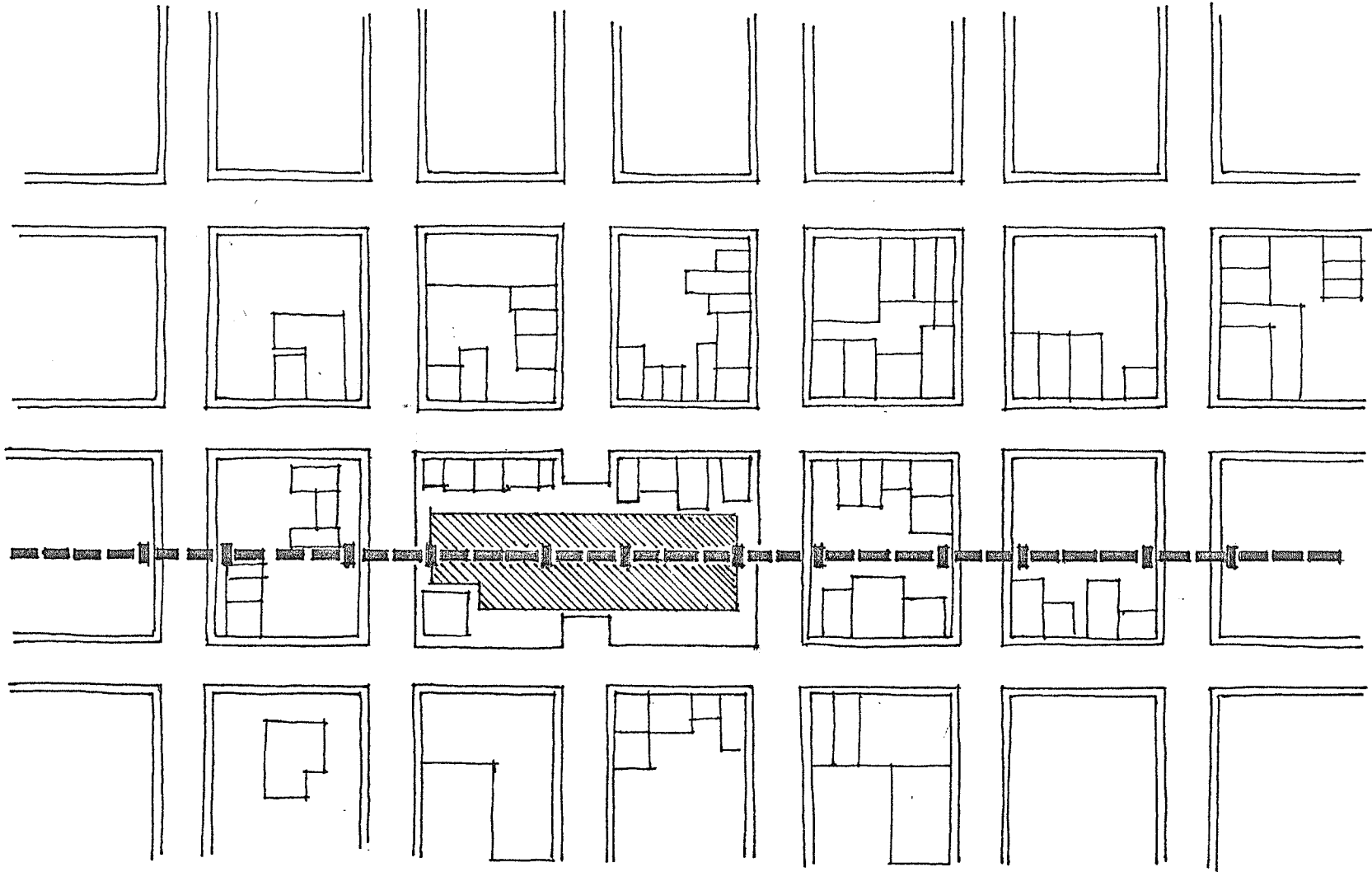


<p>MOVEMENT PATTERNS PEDESTRIAN AND PUBLIC TRANSIT</p>	<p>LRT ROUTE</p>	
	<p>PEDESTRIAN AXES</p>	
	<p>MAIN AXIS</p>	
	<p>NEIGHBORHOOD AXES</p>	
	<p>INNER AXES</p>	



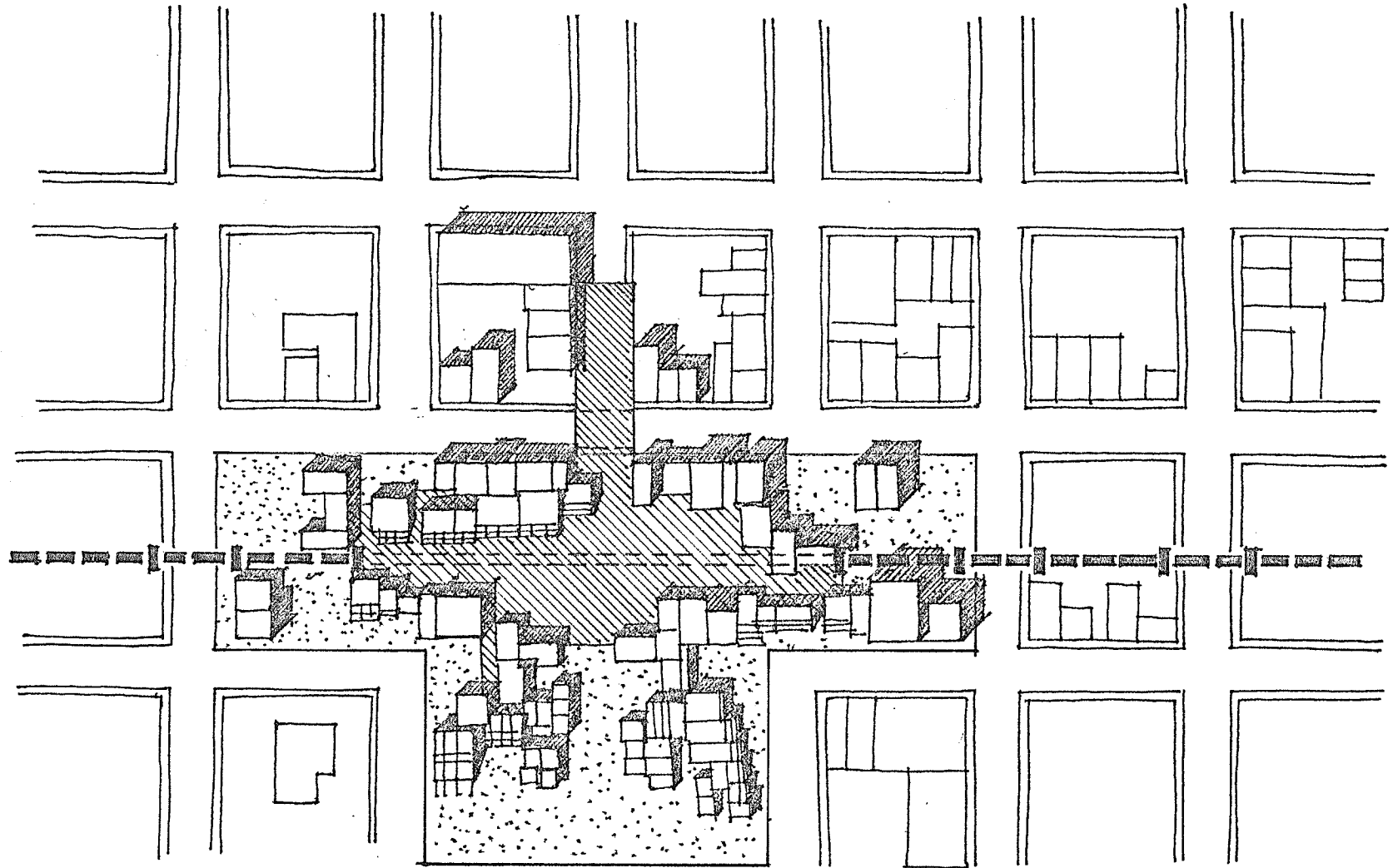
 BUILDINGS TO REMAIN
 BUILDINGS TO BE REMOVED

PROTOTYPE APPLICATION:
 REDEVELOPMENT OF INNER
 CITY DECAYED AREA



—|—| ELEVATED LRT
▨ PEDESTRIAN DECK ABOVE
LRT STATION.

PROTOTYPE APPLICATION:
REDEVELOPMENT OF INNER
CITY DECAYED AREA - PHASE ONE



<ul style="list-style-type: none"> ▬▬▬ ELEVATED LRT ▨▨▨ PEDESTRIAN DECK ▫▫▫ OPEN SPACE AND RESERVE FOR FUTURE EXPANSION 	<p>PROTOTYPE APPLICATION: REDEVELOPMENT OF INNER CITY DECAYED AREA - PHASE TWO</p>
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CHAPTER FIVE
CONCLUSIONS

The urban structure presented in chapter four is a physical manifestation of the author's conclusions regarding the requirements of the future city. It is insufficient, however, to alter the form without changing the substance in addressing underlying problems. Murray Bookchin, in his book Limits to the City, agrees that urban design "provide the basis for greater human contiguity, the structural instruments for community, a measure of contact with nature, possibly tasteful architecture, and easy access with places of work, shopping centres, and service enterprises". However, he cautions that "it leaves undefined the nature of human contiguity, community, and the relationship between the urban dweller and the natural world. Most important, it leaves undefined the nature of work, the control of the means of production, the problem of distributing goods and services equitably, and the conflicting social interests that collect around these issues" (p. 118).

The author as urban planner makes his contribution to change by presenting a prototype that incorporates an 'organic totality'--a harmony of forces that attempts to eliminate the current blight experienced in the modern city. It is the task of society to reconcile the major social and economic conflicts. Far-reaching changes in

economic, political and social relations are required to achieve a more egalitarian urban life.

LAND - USE

It is conceivable that the price of land near a proposed transit line and urban structure as proposed would skyrocket as speculators moved in ahead of the actual development process. However, this speculative disruption of orderly development can be prevented by several changes to land development practices:

- 1) Generally, land is a resource that is to be utilized for the benefit of community. This does not imply the removal of individual property rights, but is rather a protection against manipulation by privileged actors in the development process.
- 2) Undeveloped urban land or agricultural land near urbanized areas should initially be declared 'agricultural reserve'. Thus, as plans are being prepared, the hand of the speculator is restrained.
- 3) The 'agricultural' designation can remain on most of the land since its ultimate use will be rec

reational and agricultural. Again, the land may be individually owned, but with the clear understanding that its designation will not change.

- 4) The land on which the urban structure is built will increase in value drastically. This value, however, is directly related to a public decision to construct rapid transit and to permit high density uses. The increase in value, therefore, belongs to the community with compensations to participants in the construction process.

Removing urban land, agricultural land, and housing from the list of commodities that provide speculative profit is one of the most far-reaching changes that our society can make. Politicians and planners can be the forerunners by prescribing detailed legislation that will facilitate this change. As the community realizes that its chances of solving housing and other urban problems have improved, its members too will participate to ensure the success of the land use legislation. Most importantly, the participation by a large number of community members in the redevelopment or development projects can serve as a vehicle of social change.

It is the true measure or test of urban design's success when the physical models enhance human contiguity and community. Physical changes without social changes usually lead to a truncated solution. When design becomes a "natural actualization of the social relations that formed the basis of urban life" (p. 98 Limits of the City), an organic wholeness is created that establishes an inseparable quality to the two. To design monolithic structures controlled by monopolistic corporations is to defeat the possibility of effective and egalitarian social change. To allow chain stores sole access to food distribution is to deny the possibility of a good allotment garden-green house system to develop. To usurp the power and control of the inhabitants by imposing political and economic solutions from centralized decision-makers is to completely negate the possibilities of achieving the self-supporting urban prototype.

FURTHER WORK

As a prototype, the self-supporting urban structure can be treated as a 'policy' statement--a statement of the author's intentions and projections for an alternative urban future. Much has been written by architects and planners concerning urban futures and alterations to

current development practices. Although discussions and model building are valuable, present day conditions indicate that changes are required in the next two decades. The implementation phase is possible with today's technology and can incorporate development (construction) practices without the necessity for radical new technology to further complicate the process.

An implementation schedule is presented here to establish the possibilities and future directions for the self-supporting model:

- 1) 1980 to 1985:
 - a) an intense public debate to challenge outmoded development procedures.
 - b) legislative changes to propose new land protection acts and strengthen existing ones.
 - c) the accumulation of a capital fund for the construction of rapid transit and other infrastructure requirements.
- 2) 1986-1990:
 - a) based on wide community participation, a compilation of plans for future development.
- 3) 1991-2000
 - a) the construction of infrastructure-transit lines and stations in first phase.
 - b) the establishment of agricultural production areas to provide future residents of new sites with assured food supplies.
 - c) construction of residences and workplaces concurrently with temporary support spaces
 - d) replacement of temporary structures with more permanent ones.
- 4) 2000-
 - a) the alteration of uses within the structure as conditions and requirements change
 - b) the testing and measuring of social, political and economic changes enacted in the late 20th century.
 - c) the continuation or expansion of the model into areas previously immune from problems or more fortunate--a process of balancing regional disparities.

- b) acquisition of sites through public expropriation and equitable reimbursement to existing landholders.
- c) the construction of the initial line or lines of public transit

To effect an implementation schedule that will substantially alter urban patterns within two or three decades requires a commitment to replace the obsolete with a more viable urban future. The author is committed to creating a new synthesis that combines individual and community needs within an urban infrastructure that is socially and ecologically complementary.

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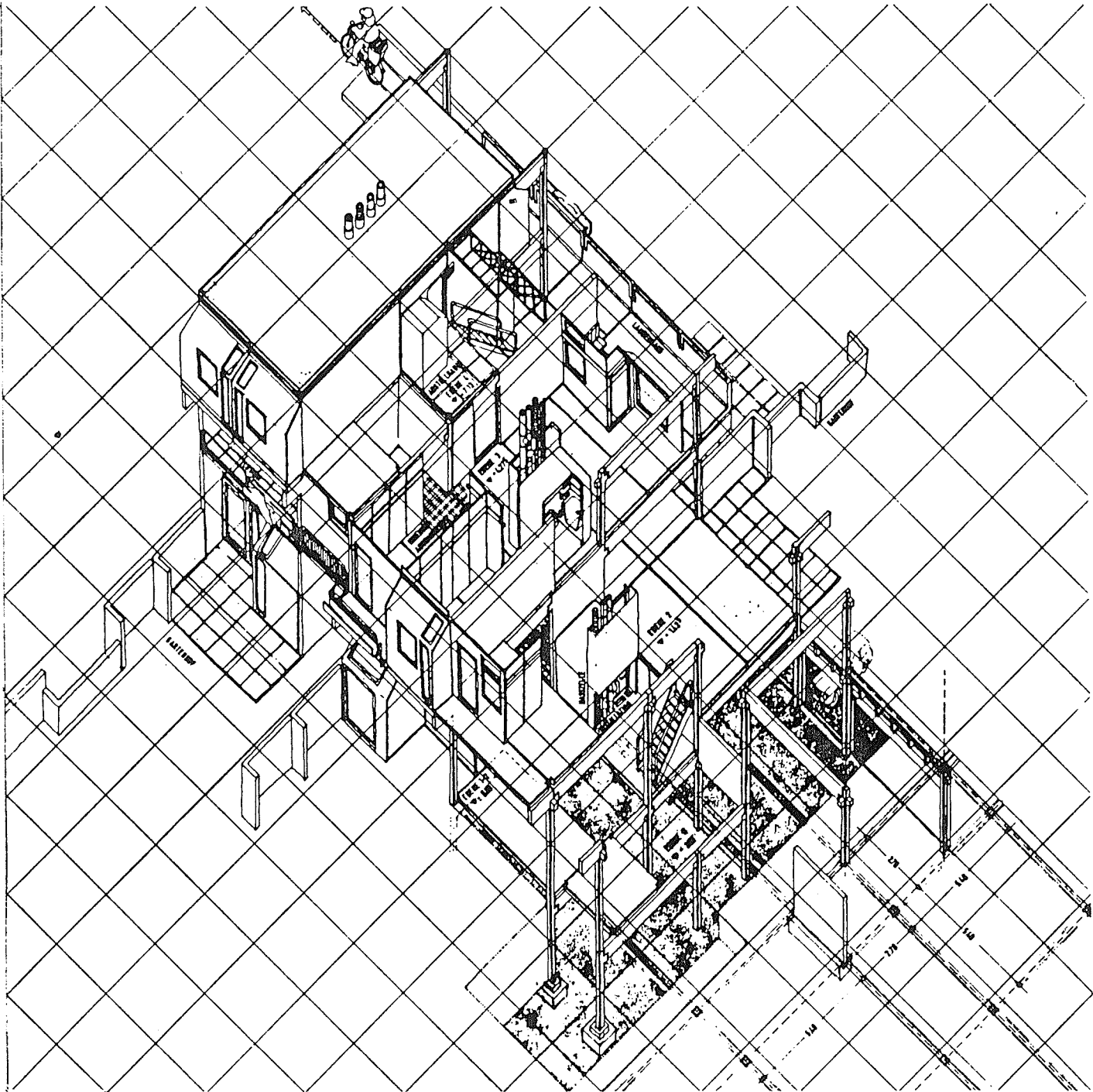
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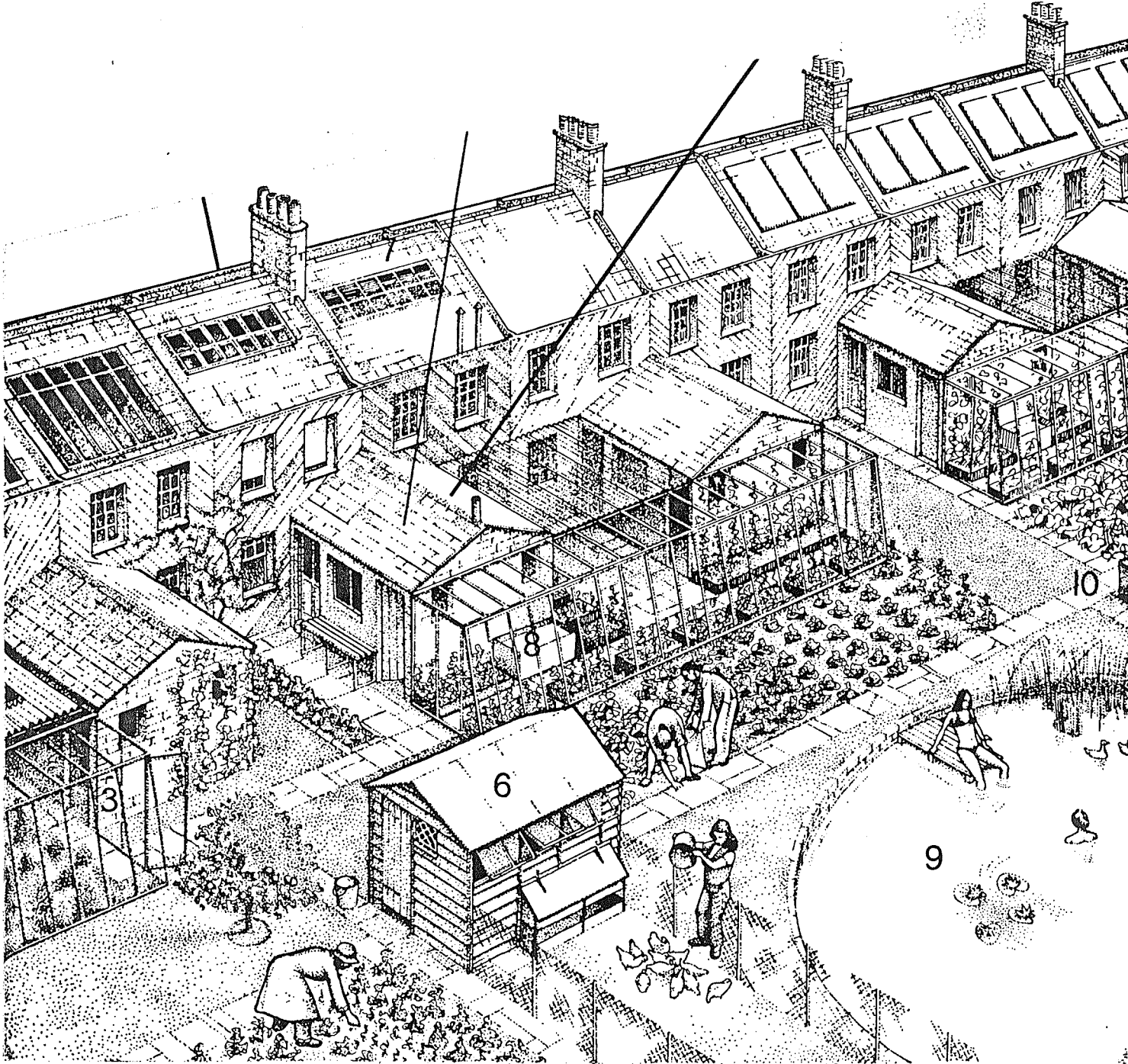
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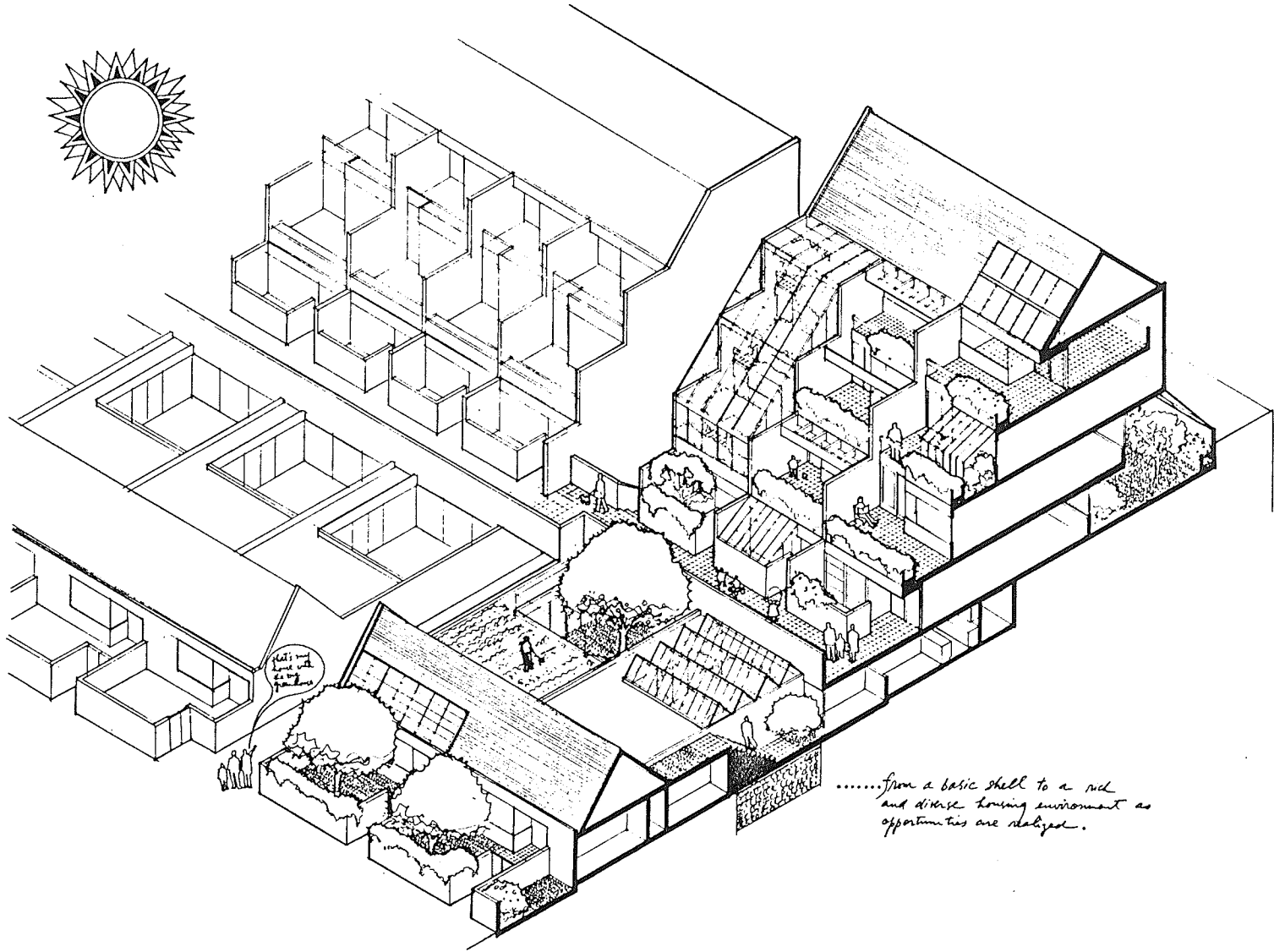
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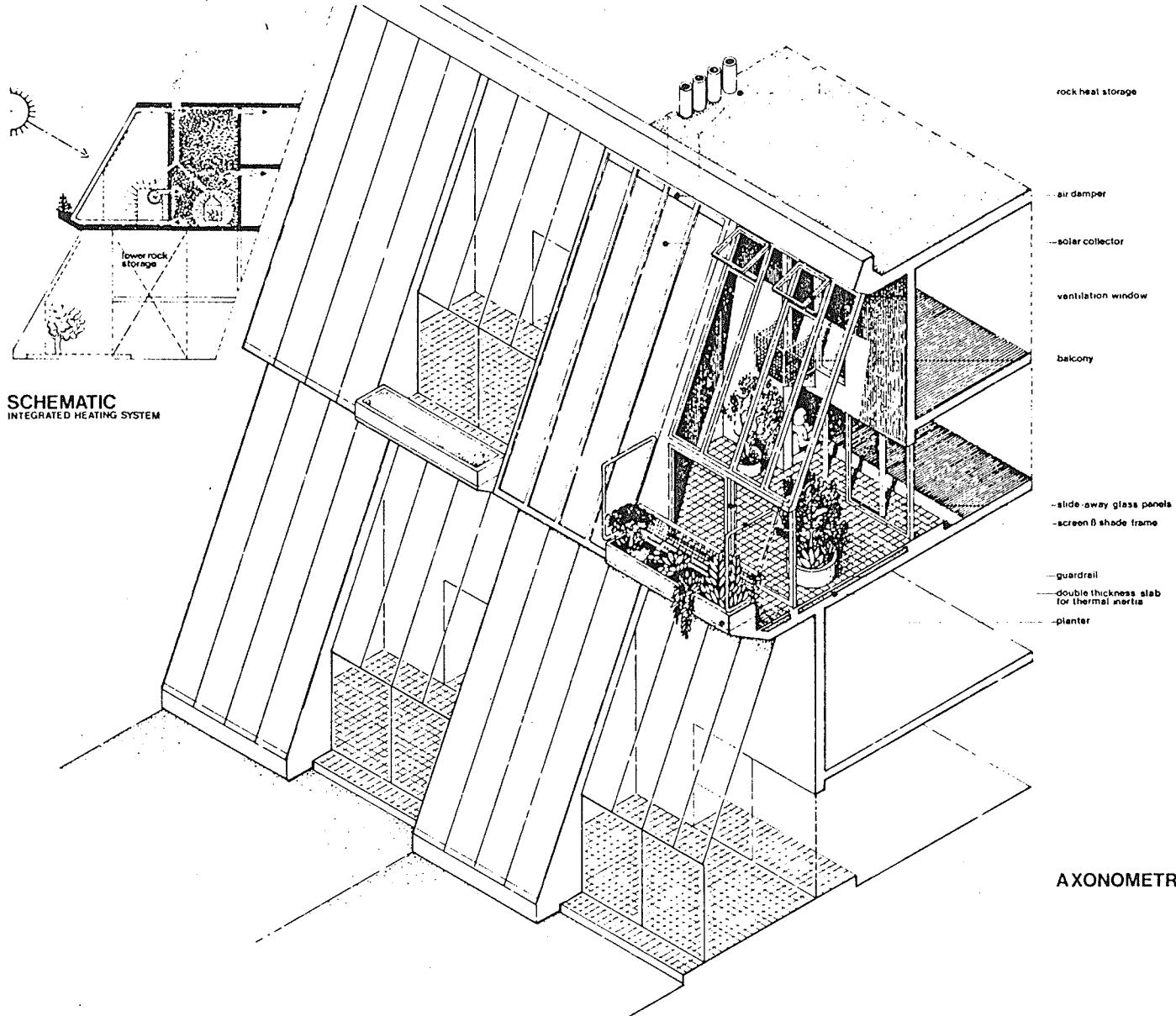
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APPENDIX









SCHEMATIC
INTEGRATED HEATING SYSTEM

rock heat storage

air damper

solar collector

ventilation window

balcony

slide-away glass panels

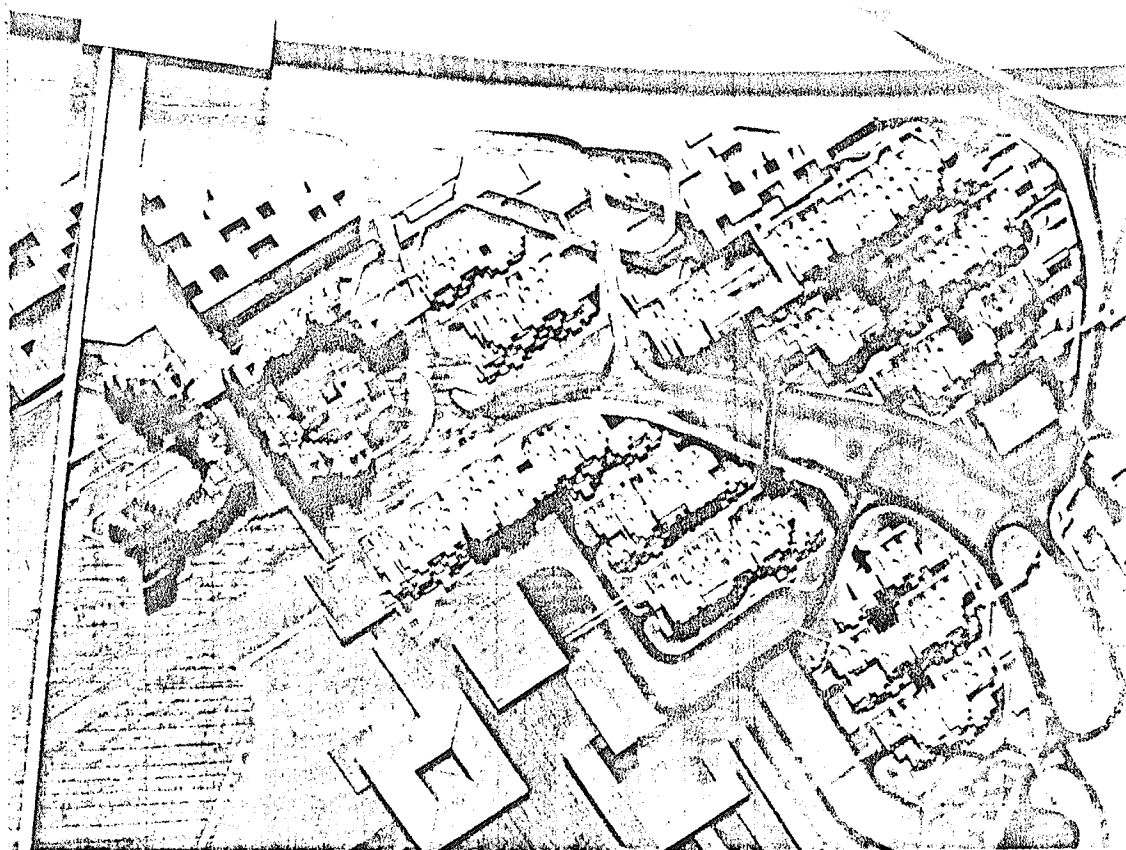
screen & shade frame

guardrail

double thickness slab
for thermal inertia

planter

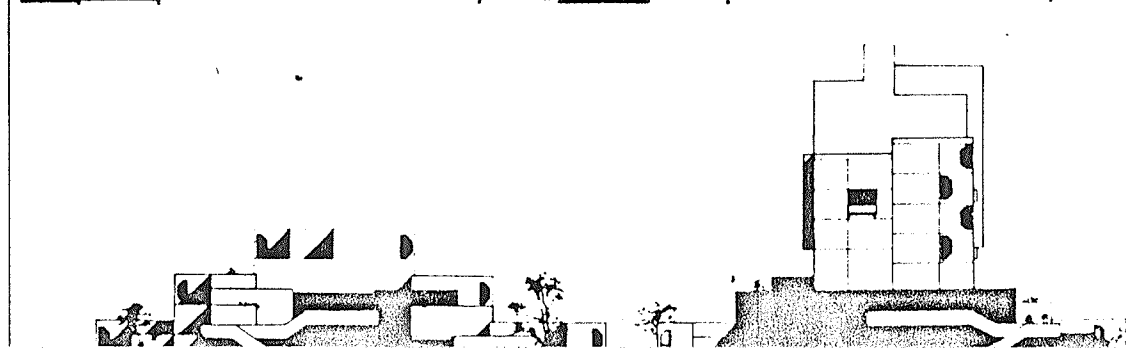
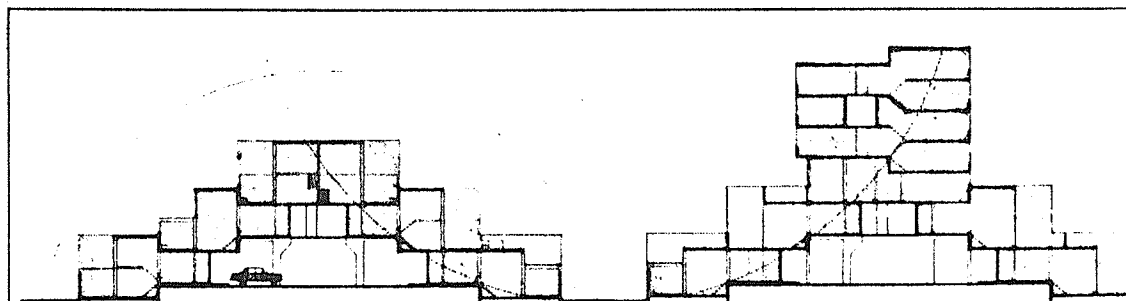
AXONOMETRIC

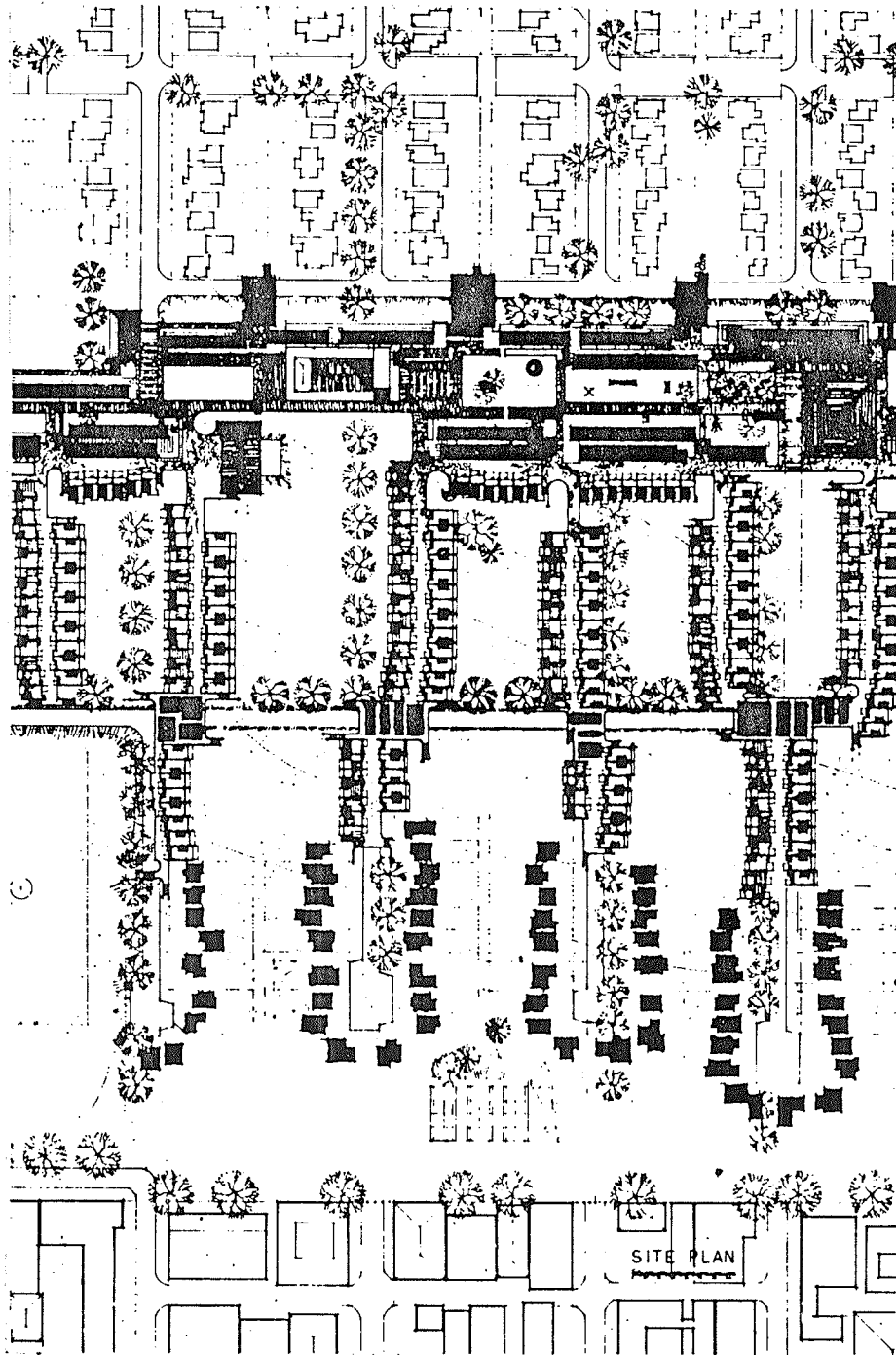


**Pont de Bois
Ville nouvelle
de Lille-Est**

**“ 1077 logements
semi-urbains ”**

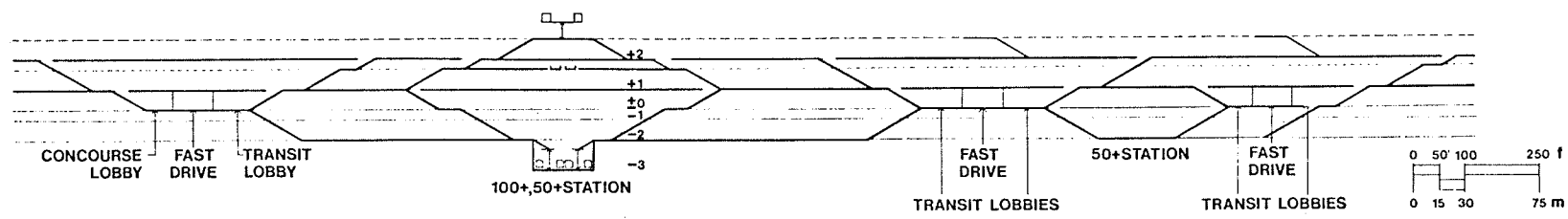
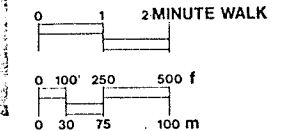
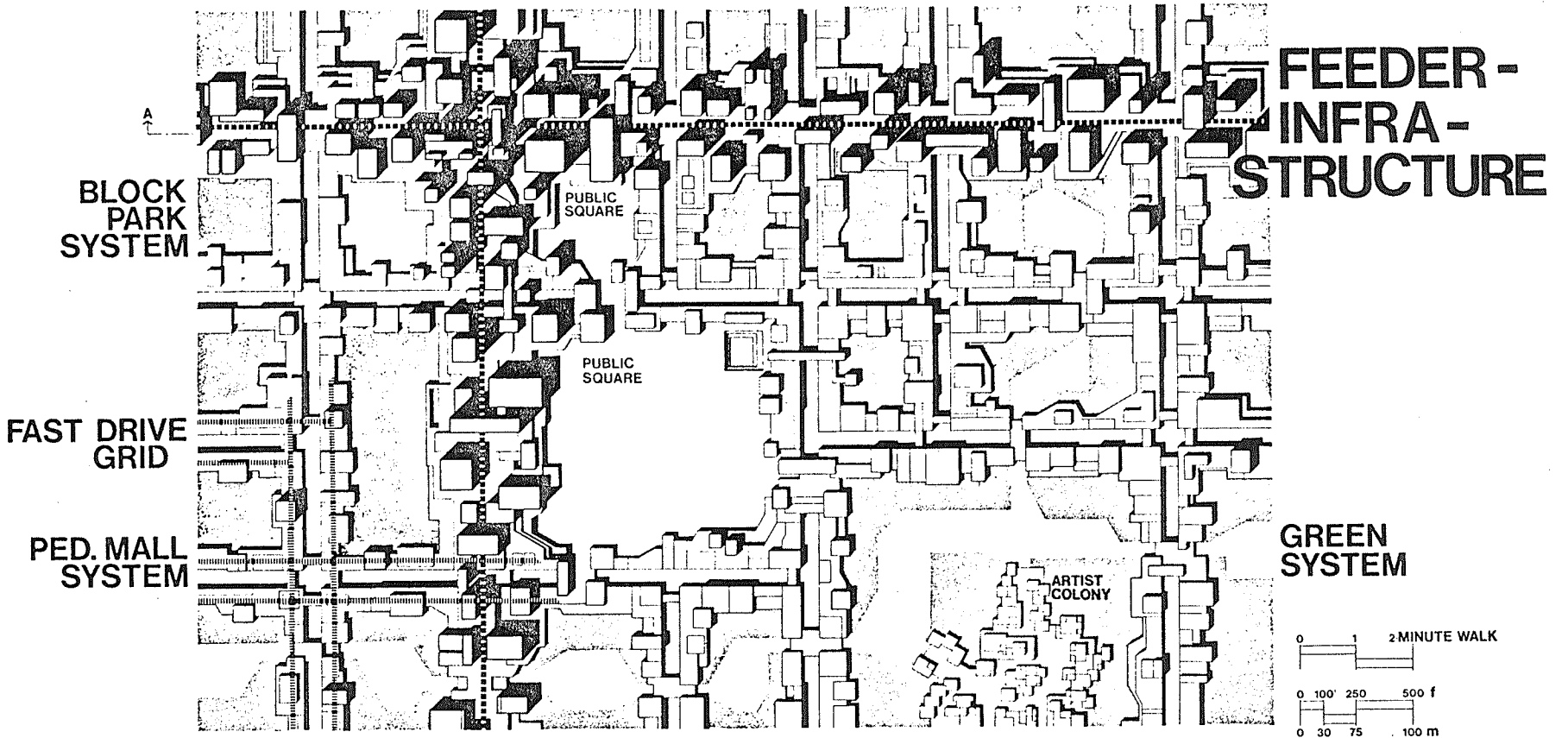
Maitres d'ouvrage :
Foyer du fonctionnaire et de
la famille (799 logements),
O.P.H.L.M. de la communauté
urbaine de Lille-Roubaix-
Tourcoing (223 logements)
et Société anonyme d'H.L.M.
de Lille et environs
(55 logements)
Architecte : Atelier Josic
Fin des travaux prévue
pour 1976





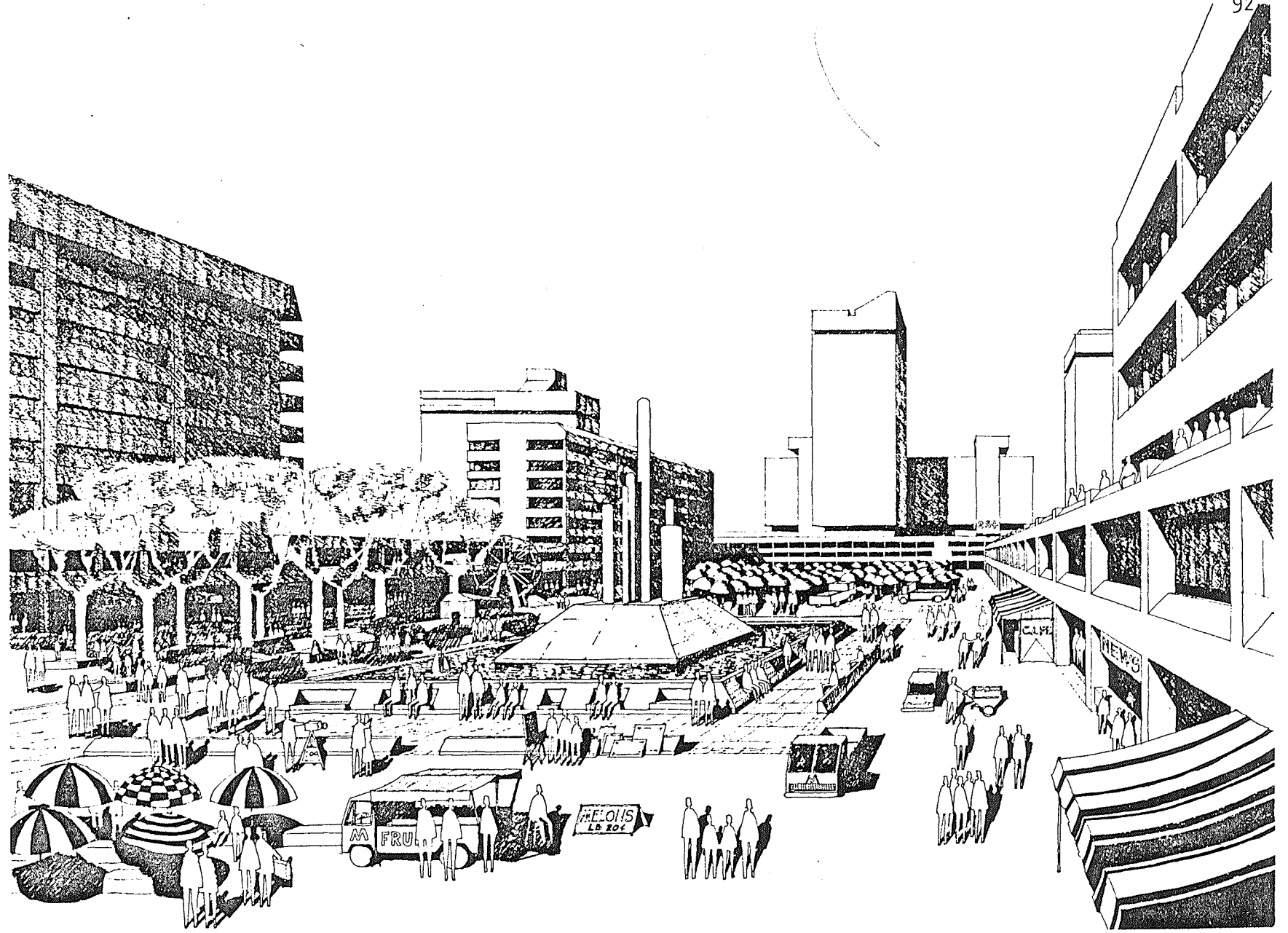
90 -
Plan of Urbville showing the three zones of housing, their relations to institutions at nodes and the central pedestrian strips, center of many activities. It also indicates how the system can be used to merge to an existing district.

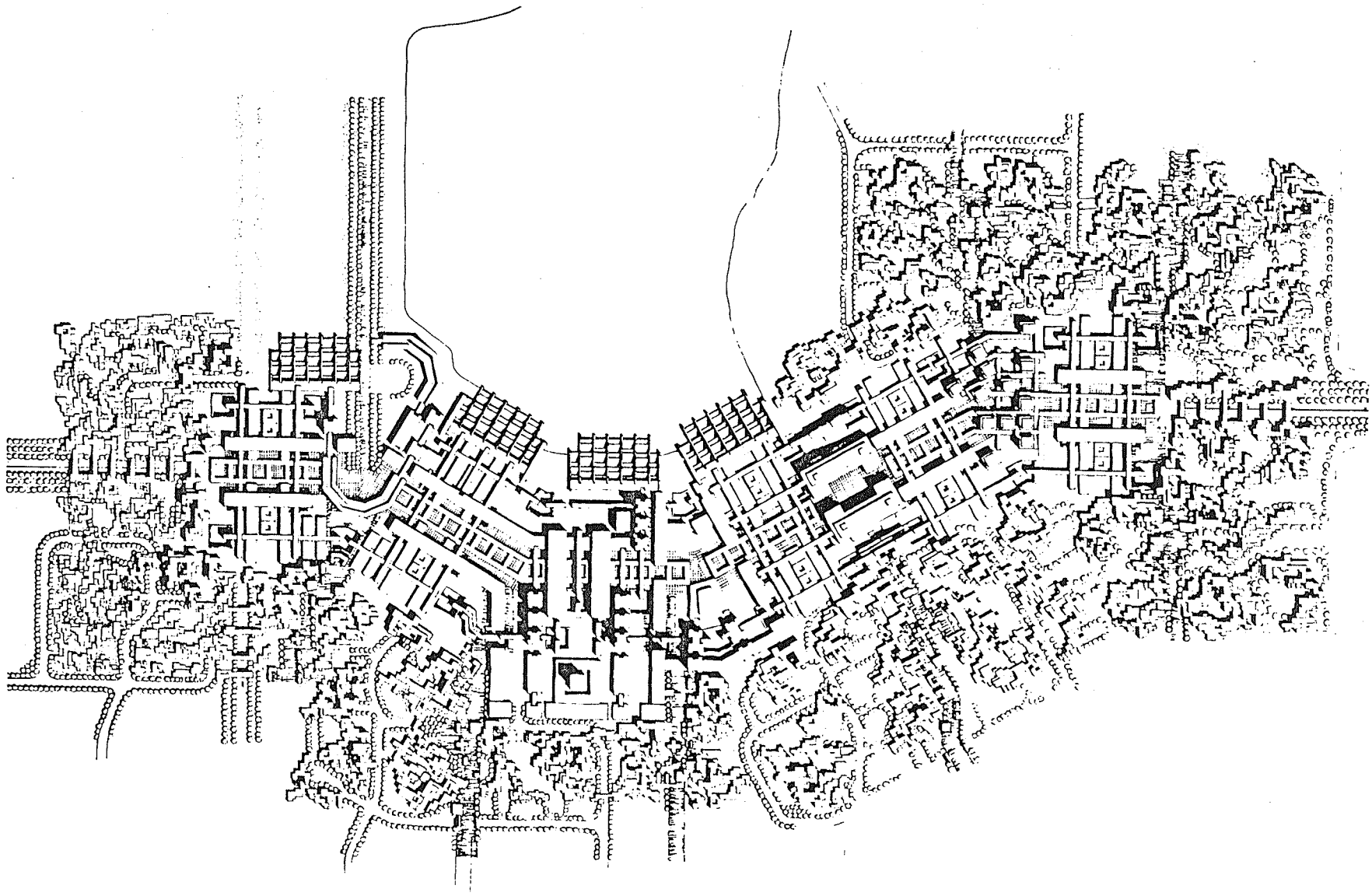
Plan d'Urbville montrant trois zones d'habitations, les relations entre établissements et centres d'activités et indiquant comment un système peut-être (intégré) adapté à une région.



SECTION A

NOTE: Vertical scale double



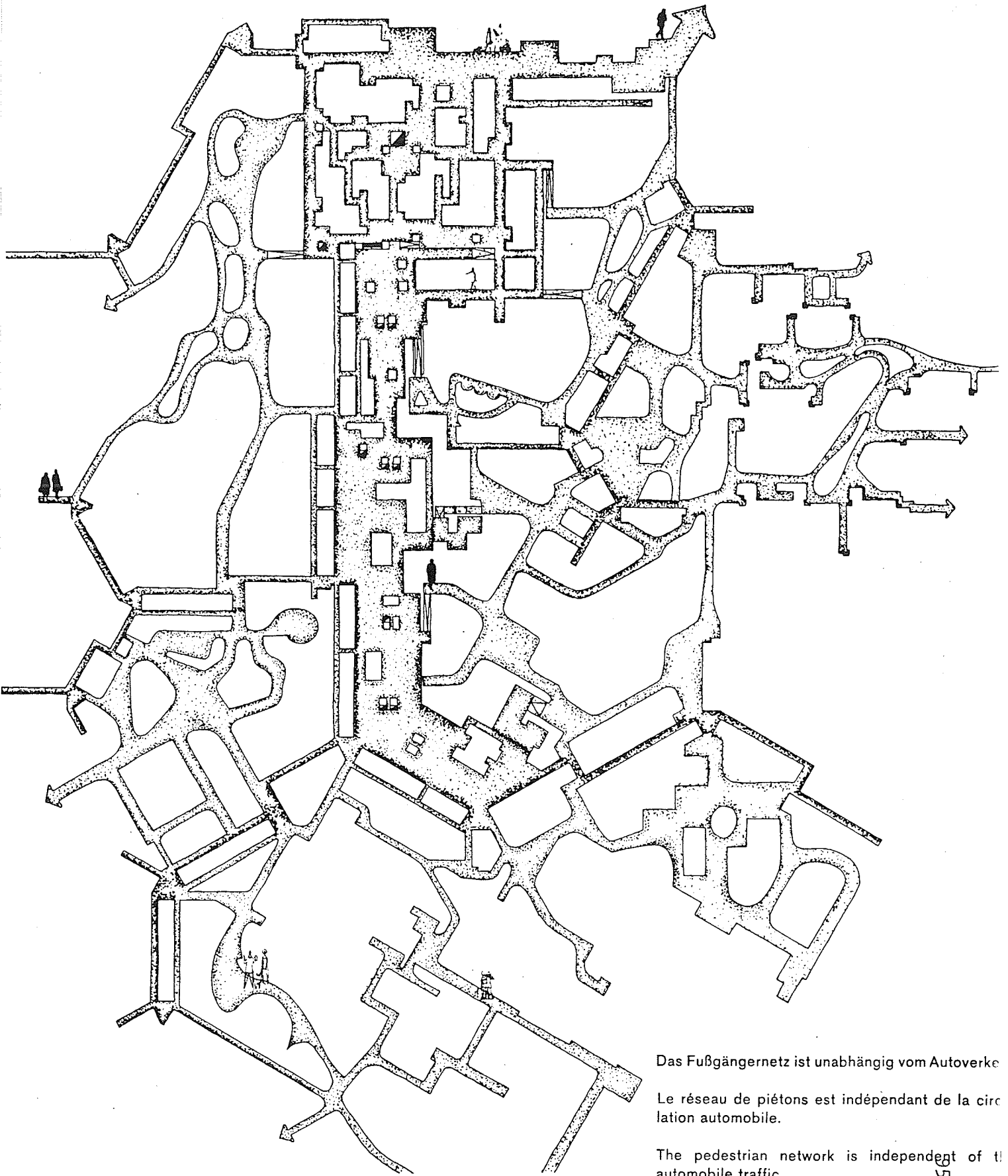


The central area of the Deer Lake Town: There is a continuous pedestrian path with civic squares and commercial malls opening up from it. Housing ter-

aces are stepped down to the Lake and stacked housing clusters are surrounding the commercial core.

DETAILS

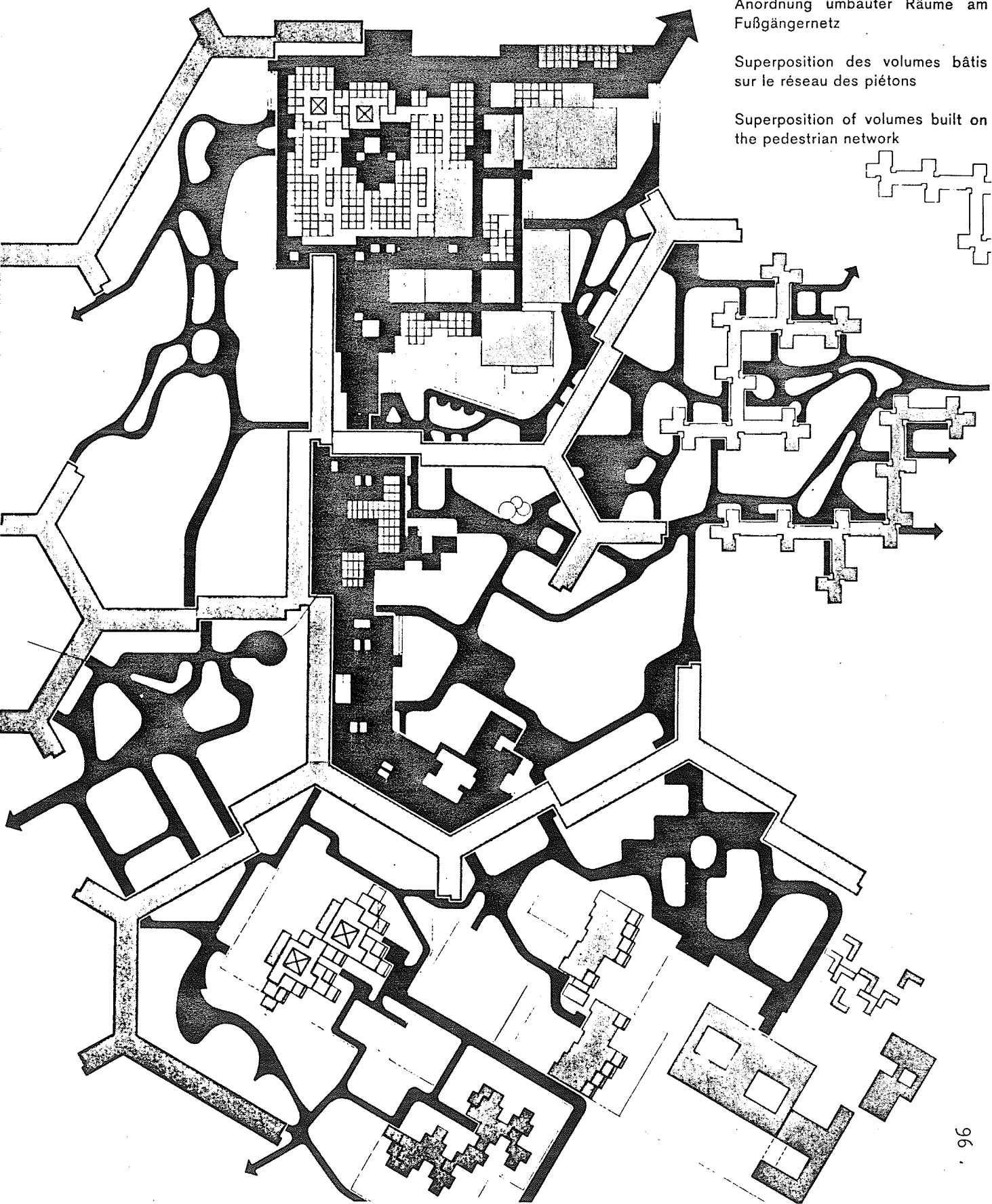
TOULOUSE LE MIRAIL



Das Fußgängernetz ist unabhängig vom Autoverkehr.

Le réseau de piétons est indépendant de la circulation automobile.

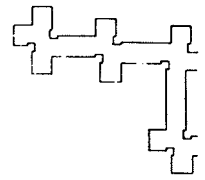
The pedestrian network is independent of the automobile traffic.



Anordnung umbauter Räume am Fußgängernetz

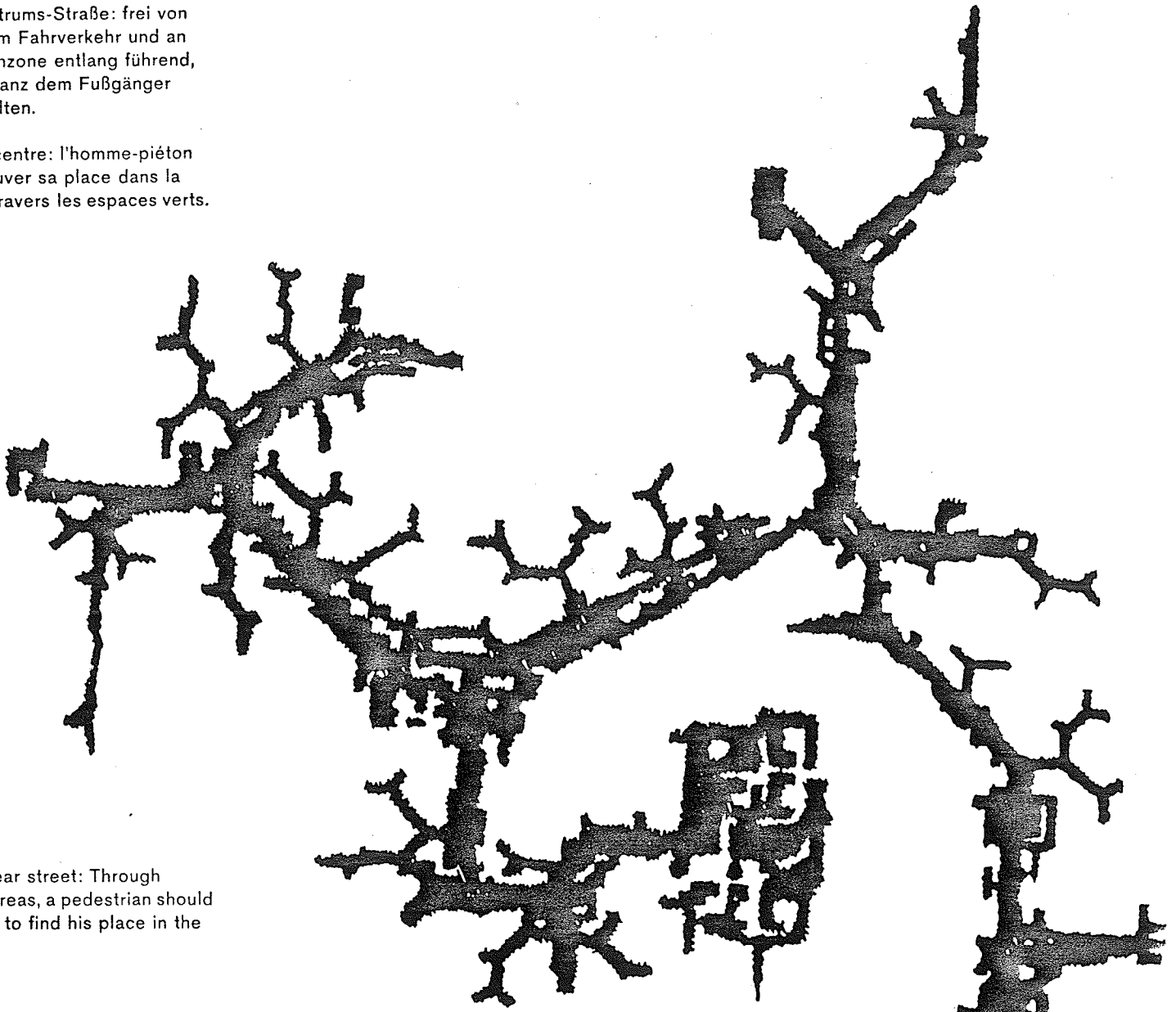
Superposition des volumes bâtis sur le réseau des piétons

Superposition of volumes built on the pedestrian network

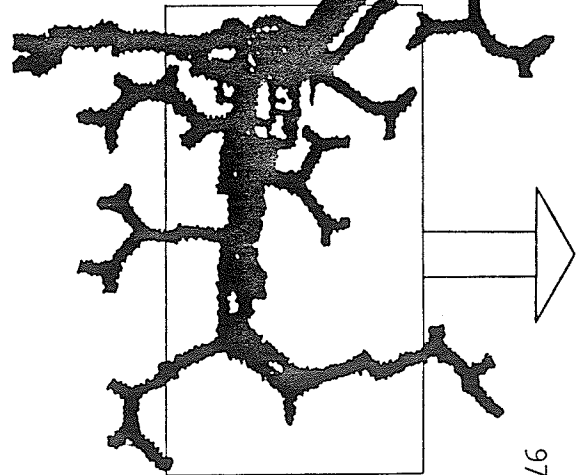
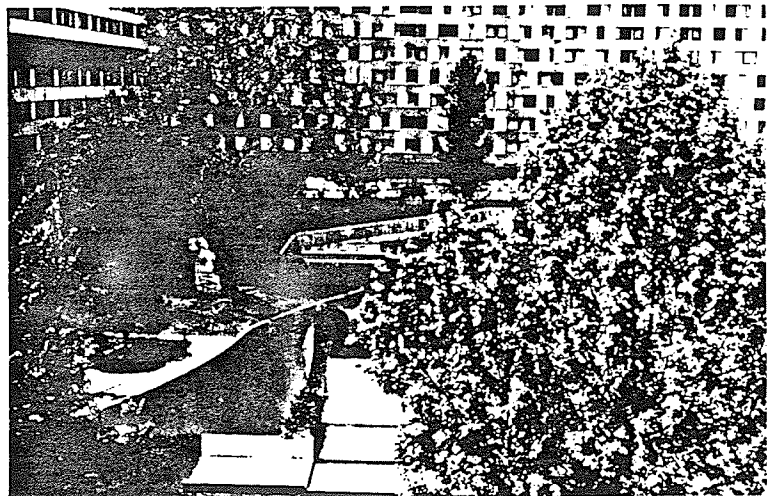


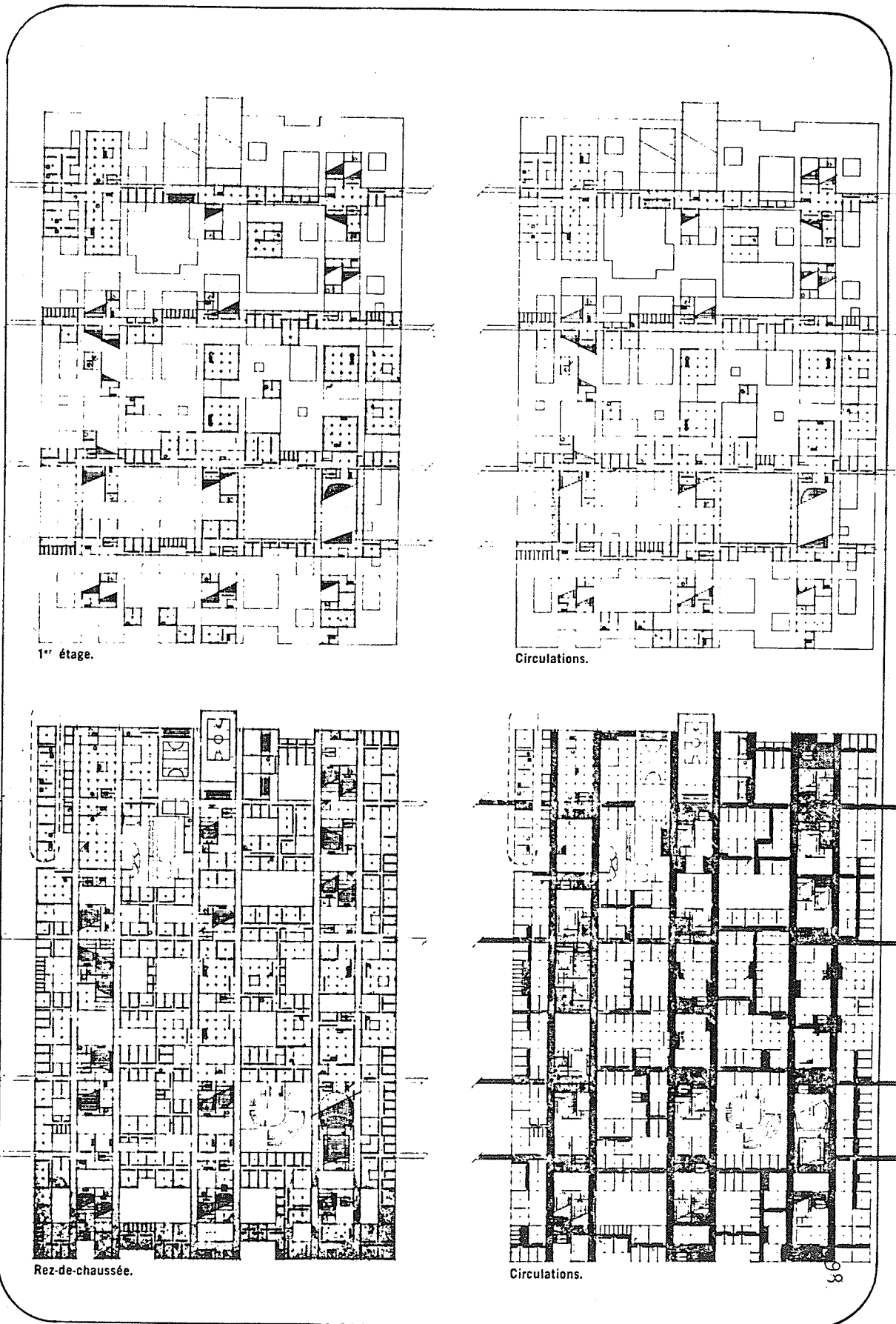
Die Zentrums-Straße: frei von jeglichem Fahrverkehr und an der Grünzone entlang führend, ist sie ganz dem Fußgänger vorbehalten.

La rue centre: l'homme-piéton doit trouver sa place dans la cité, à travers les espaces verts.



The linear street: Through green-areas, a pedestrian should be able to find his place in the city.

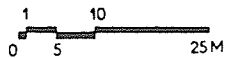
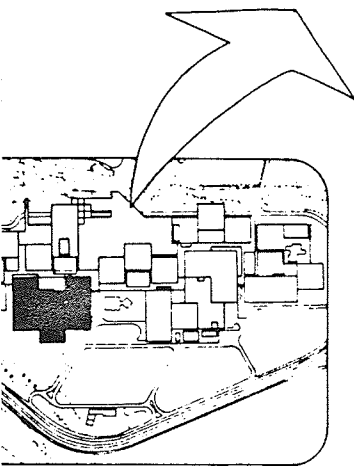
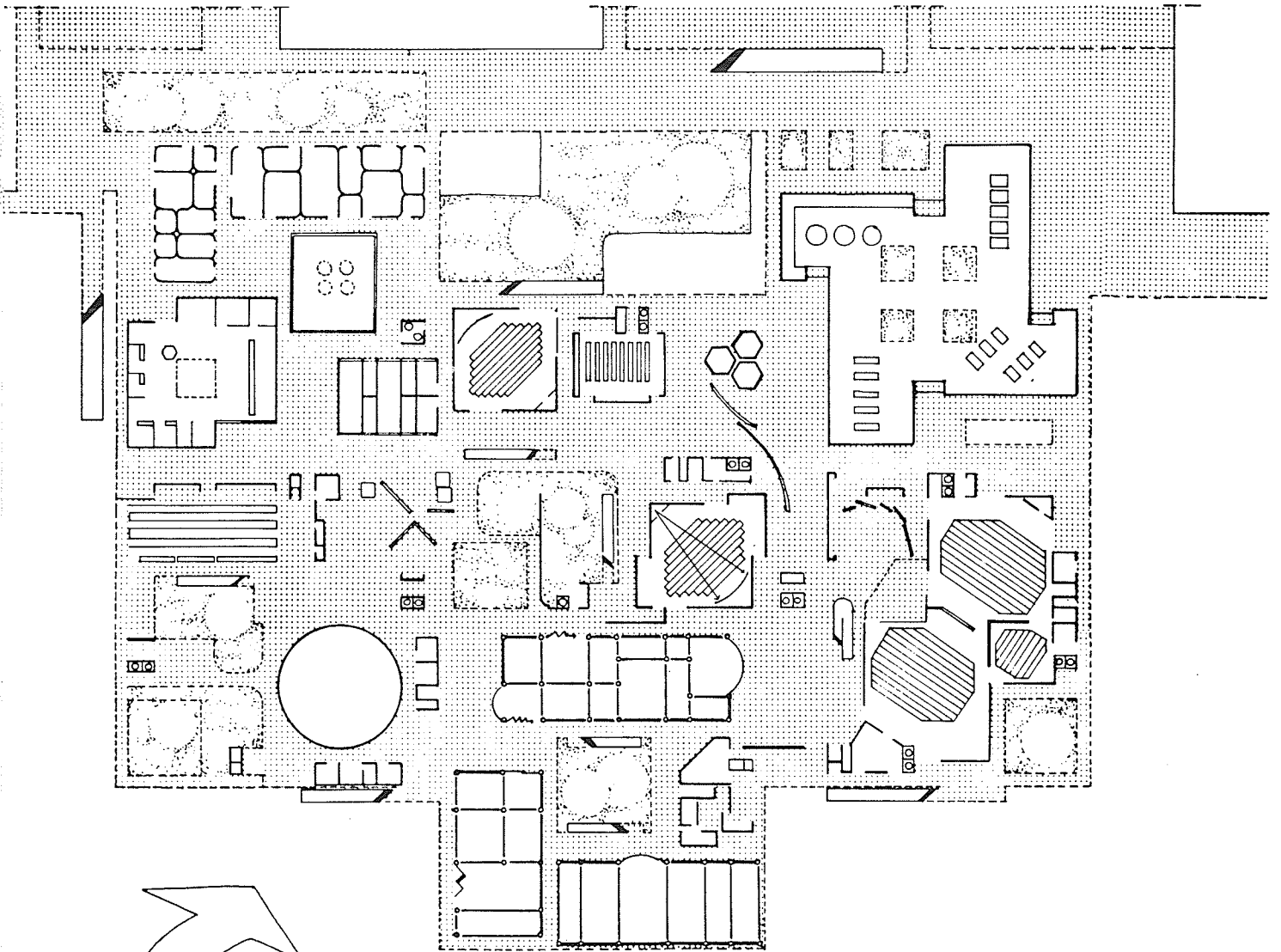
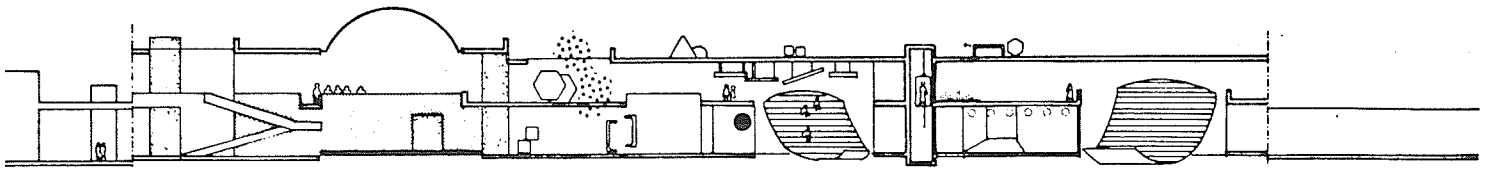




suchten und wählten ein
em, einer städtebau-
in Struktur vergleichbar,
eine Weiterentwicklung
Tätigkeiten an jedem
kt und zu jeder Zeit er-
licht.

s avons cherché et choisi
ystème, une organisation
ine qui permettra le
éveloppement des activités
mporte quel endroit et
mporte quel moment.

have searched and
en a system, a town-
ning organization which
permit the development
ctivities no matter when
here.



Einrichtungsbeispiel des «Centre Régional»: Die einfache, klare Bauweise läßt große Freiheit bei der Benutzung der Räume.

Exemple d'aménagement du «Centre Régional»: la simplicité de la construction laisse une grande liberté d'occupation des locaux.

Planning example of the "Centre Regional": the simpleness of the construction allows great liberty for room occupation.

ationshäuser in Horizontal-
 erungen mit geringer
 ichte (25–30 Wohnungen
) schaffen Bedingungen
 nach außen hin relativ
 hlossenes Familienleben.
 emeinschaftsanlagen und
 icken haben in diesem
 ur eine zweitrangige Be-
 g.

Wohngebäude sind von
 entrumms-Straße am wei-
 entfernt.

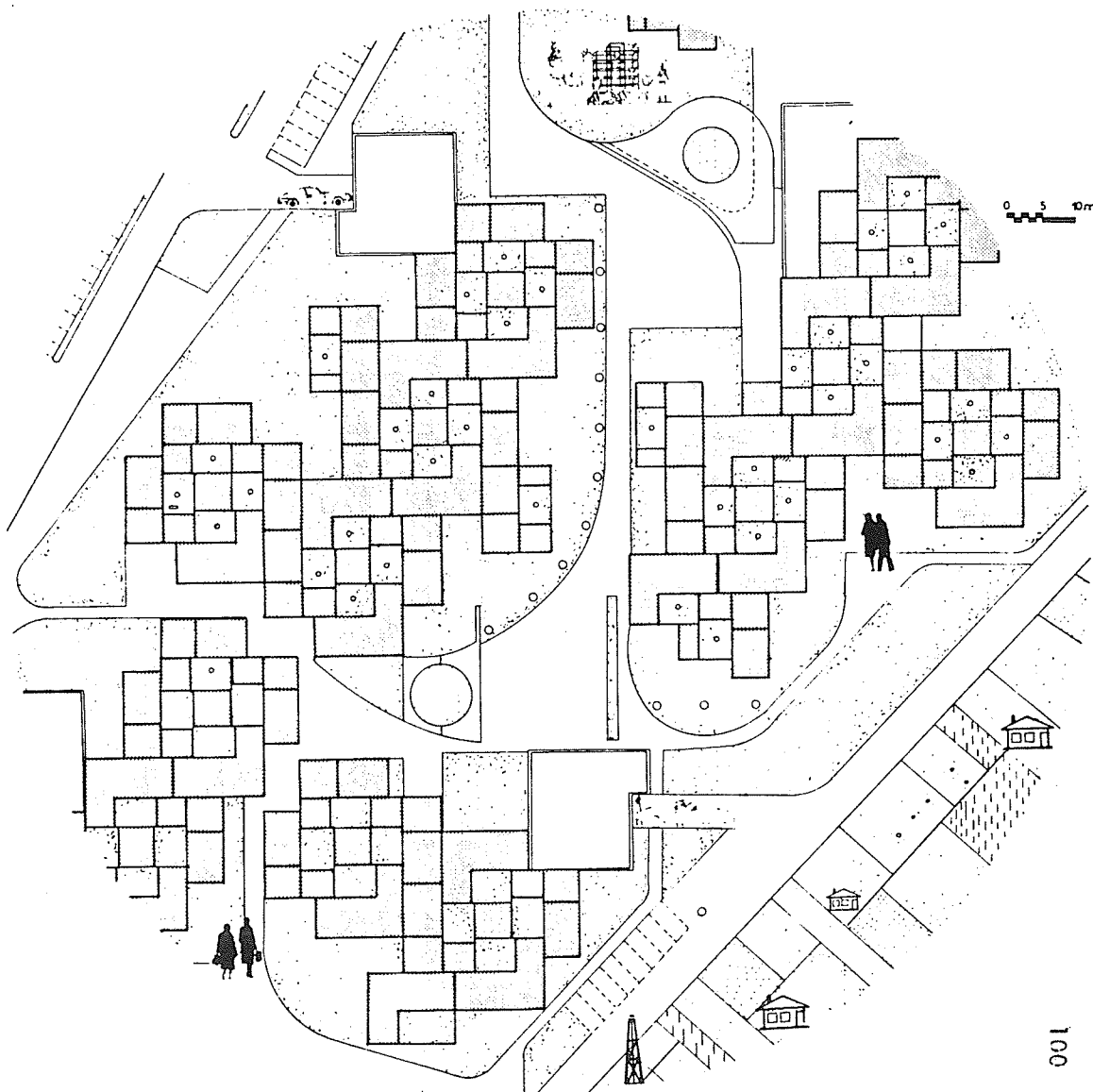


las-patios groupées dans
 tème horizontal de faible
 e (25–30 logements à
 re) provoquent des con-
 de vie familiale plus
 s vers l'extérieur.

atios-espaces extérieurs
 s, participent uniquement
 anouissement de la vie
 amille.

quipements et espaces
 ifs jouent dans ce cas
 secondaire.

nsembles se situent à
 de la Rue-Centre.



patio-villas" grouped in a
 ntal system of low den-
 5 to 30 housing units per
 e) create the conditions
 ily life to be more closed
 exterior world.

rivate patio areas are
 ble to the welfare of a
 family only.

utive functions and com-
 areas in this case merely
 secondary role.

building-groups are set
 rom Center Street.